HPCL-MITTAL PIPELINES LIMITED

(A wholly owned Subsidiary of HMEL)

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Corporate Office : 3rd Floor, Inox Towers, Plot No. 17, Sector 16A, Noida-201301 in the State of Uttar Pradesh. Tel : 0120 – 463 4500/4610, Fax : 0120-42719 38/39/40.

Pre-feasibility Report as per EIA Notification 2006: Mundra – Bathinda Pipeline Capacity Expansion Project

NOVEMBER 2015

HPCL-MITTAL PIPELINES LIMITED

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ABBREVIATIONS

API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
DG	Diesel generator
ESD	Emergency Shut Down
FV	Full Vacuum
HDPE	High Density Polyethylene
IEC	International Electro technical Commission
IJ	Insulating Joint
IPS	Intermediate Pigging Station
ISA	International Society of Automation
MOC	Material of Construction
MBPL	Mundra-Bathinda Pipeline
MMTPA	Million Metric ton per Annum
MSL	Mean Sea Level
NBP	Nominal Boiling Point
OFC	Optical Fiber Cable
OISD	Oil Industry Safety Directorate
PE	Polyethylene
PFD	Process Flow Diagram
PUF	Polyurethane Foam
PE	Polyethylene
RCC	Reinforced Cement Concrete
RJ	Rajasthan
SCADA	Supervisory Control And Data Acquisition
XSV	Emergency Shutdown Valve

1 EXECUTIVE SUMMARY

HPCL-Mittal Pipelines Limited (HMPL) is a Company incorporated under the provisions of The Indian Companies Act, 1956 and having its Registered Office at Village Phulokhari, Taluka Talwandi Saboo, District Bathinda (Punjab). It is a subsidiary of HPCL-Mittal Energy Limited (HMEL) which is a Joint Venture between M/s Hindustan Petroleum Corporation Limited (a Government of India Public Sector Enterprise and a Fortune 500 company) and M/s Mittal Energy Investments Private Limited.

HMPL intends to expand the capacity of its Mundra – Bathinda Pipeline (MBPL) to transport the enhanced crude oil requirement of HMEL's Guru Gobind Singh Refinery (GGSR) near Bathinda, commensurate to their capacity expansion plan by converting two of its intermediate pigging stations into pumping stations.

The pipeline presently has an installed capacity of 9 MMTPA with its head pumping station (also called dispatch terminal or DT) at Khasra no. 141/P, Village Mundra, Taluka Mundra, District Kutch in Gujarat and an intermediate pumping station (also called IPS-3) at Survey Nos. 152, 156, 157, 172, 173, Village Dhansa, Tehsil Jaswantpura, District Jalore in Rajasthan with provisions to expand its capacity to 18 MMTPA by converting its four intermediate pigging stations into pumping stations. The four intermediate pigging stations are located as under along the pipeline and has sufficient land for conversion into pumping stations.

a) IPS-1 : Survey Nos. 103/2-P1&P2, 104, 105, Village Dedarva, Taluka Rapar, District Kutch in Gujarat
b) IPS-2 : Survey Nos. 90/1P, 91, 92P1, Village Juna Raviyana, Taluka Kankrej, District Banaskantha in Gujarat
c) IPS-4 : Survey No. 219, Village Jud, Tehsil Osiyan, District Jodhpur in Rajasthan
d) IPS-5 : Survey No. 67, Town Shri Dungargarh, Tehsil Shri Dungargarh, District Bikaner in Rajasthan

In the proposed project, the two of the four intermediate pigging stations of MBPL are proposed to be converted into pumping stations as under :

a) One among IPS-1 & IPS-2 will be selected for conversion based on engineering studies.
b) One among IPS-4 & IPS-5 will be selected for conversion based on engineering studies.

The project involves setting up of the following major facilities at each of these selected intermediate pigging stations:

- Pumps, DG sets, metering unit, filtering unit, fire water network with pumps, pump sheds, control room, warehouse, canteen, parking sheds etc.
- Alternative sites for the proposed project have not been considered as these intermediate pigging stations have sufficient land for conversion into pumping stations.

For the project, ~24.2 KLD water will be required at each of these two stations to operate the facilities including the green belt. Groundwater is present at the site and will be used for the project after due clearance from the Central Ground Water Authority. ~2.43 KLD of domestic waste at each of these two stations is expected to be generated.

~ 6000KVA power will be required for operating the facilities at each of these two stations. This power requirement will be met from the Grid through dedicated feeder from the nearest GETCO substation. During power outages, to meet the power requirement of the essential facilities, a 320

KVA DG set will be provided as an emergency back-up at each of these two stations. Around 25% out of the total land (industrial area), will be kept for greenbelt purposes.

The expected time for the completion of the project is two years from the receipt of environment clearance and it will cost around INR 240 crores.

The project will also provide benefits to the local people in terms of employment and local business.

2 INTRODUCTION OF THE PROJECT

2.1 Identification of Project and Project Proponent

2.1.1 About the Project

HPCL-Mittal Pipelines Limited's Mundra-Bathinda Pipeline (MBPL) which passes through the States of Gujarat, Rajasthan and Haryana caters to crude oil requirement of Guru Gobind Singh Refinery (GGSR) of HPCL-Mittal Energy Limited (HMEL) by transporting imported crude oils from its Mundra Terminal in Mundra, Gujarat to GGSR near Bathinda, Punjab. It is currently designed to transport imported crude blends upto 9MMTPA in Phase-1 with a provision of capacity enhancement in phases upto 18MMTPA in phae III by converting its existing pigging stations into pumping stations in future.

HMPL intends to expand the capacity of its Mundra – Bathinda Pipeline (MBPL) to transport the enhanced crude oil requirement of HMEL's Guru Gobind Singh Refinery (GGSR) near Bathinda, commensurate to their capacity expansion plan to 11.25 MMTPA under Phase II by converting two of its four intermediate pigging stations into pumping stations.

2.1.2 The Proponent-HPCL-Mittal Pipelines Limited

HPCL-Mittal Pipelines Limited (HMPL) is a Company incorporated under the provisions of The Indian Companies Act, 1956 and having its Registered Office at Village Phulokhari, Taluka Talwandi Saboo, District Bathinda (Punjab). It is a wholly owned subsidiary of HPCL-Mittal Energy Limited (HMEL) which is a Joint Venture between M/s Hindustan Petroleum Corporation Limited (a Government of India Public Sector Enterprise and a Fortune 500 company) and M/s Mittal Energy Investments Private Limited.

2.2 Brief Description of Nature of the Project

The Mundra – Bathinda pipeline presently transports imported crude oil blends from Mundra Port to Guru Gobind Singh Refinery of HMEL at an installed capacity of 9 MMTPA with its head pumping station (also called dispatch terminal or DT) at Khasra no. 141/P, Village Mundra, Taluka Mundra, District Kutch in Gujarat and an intermediate pumping station (also called IPS-3) at Survey Nos. 152, 156, 157, 172, 173, Village Dhansa, Tehsil Jaswantpura, District Jalore in Rajasthan with provisions to expand its capacity to 18 MMTPA by converting its four intermediate pigging stations into pumping stations. The four intermediate pigging stations are located as under along the pipeline and have sufficient land for conversion into pumping stations.

a) IPS-1 : Survey Nos. 103/2-P1&P2, 104, 105, Village Dedarva, Taluka Rapar, District Kutch in Gujarat
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c) IPS-4 : Survey No. 219, Village Jud, Tehsil Osiyan, District Jodhpur in Rajasthan
d) IPS-5 : Survey No. 67, Town Shri Dungargarh, Tehsil Shri Dungargarh, District Bikaner in Rajasthan

In the proposed project, the two of the four intermediate pigging stations of MBPL are proposed to be converted into pumping stations as under :

a) One among IPS-1 & IPS-2 will be selected for conversion based on engineering studies.
b) One among IPS-4 & IPS-5 will be selected for conversion based on engineering studies.

In these pumping stations, the crude oil will flow from pig receiver bypass line, will be filtered by the basket filters, monitored by ultrasonic flow meter, its pressure will be boosted by the mainline pumps and will flow back into the pipeline.

Drained oil from pig receiver, main line pumps and basket filters shall be routed to existing licensed underground sump tanks from where it shall be pumped back into the pipeline. In case of any accidental spillage/leakage, oil will be recovered manually as far as practicable for suitable recovery.

In emergency, the pumping shall be stopped bypassing the crude oil flow in Mundra-Bathinda pipeline.

The project involves setting up of the following major facilities at each of these selected intermediate pigging stations:

- Pumps, DG sets, metering unit, filtering unit, fire water network with pumps, pump sheds, control room, warehouse, canteen, parking sheds etc.
- Alternative sites for the proposed project have not been considered as these intermediate pigging stations have sufficient land for conversion into pumping stations.

2.3 Need for the Project and its Importance to the Country and or Region

The consumption of petroleum products in India is growing at a stable growth rate and with the sustained growth in the Indian Economy; the demand for energy is expected to rise steadily over the years. It is estimated that the demand for retail petroleum products will grow at around 5-6% per year in next 10 years.

HPCL, a Navratna Public Sector Company is an integrated refining and marketing company in India and is one of the Sponsors of HMEL. Earlier, the gap between HPCL's market share in North India was being met from other refiners till GGSR was set up to bridge the gap in refining capacity and demand off-take in the region to the extent possible. The refinery with Nelson Complexity index of 9.6 is configured to process heavy and acidic crudes like Maya and Doba and produces high value petrochemical products. There exists a large demand- supply mismatch of petroleum products in Northern India with demand outstripping the supply from other North Indian refineries and GGSR partially caters to this imbalance in the northern region of India.

2.4 Demand-Supply Gap

It has been observed that a gap in demand is exists in North India. The refineries in India along with their installed capacity (as published by PPAC, MOP&NG, Govt. of India in Ready Reckoner dated June' 2015) are shown in ***Table 2-1***.

Table 2-1: List of Refineries along with the Installed Capacity

REFINERIES	CAPACITY (TMTPA)
PUBLIC SECTOR (PSU)	

REFINERIES	CAPACITY (TMTPA)
IOC	
IOC, Digboi	650
IOC, Guwahati	1000
IOC, Koyali	13700
IOC, Barauni	6000
IOC, Haldia	7500
IOC, Mathura	8000
IOC, Panipat	15000
IOC, Bongaigaon	2350
IOC,Total	**54200**
HPC	
HPC, Mumbai	6500
HPC, Visakh	8300
HMEL,GGSR	9000
HPC,Total	**23800**
BPC	
BPC, Mumbai	12000
BPC, Kochi	9500
BPC, BORL-Bina	6000
BPC, Total	**27500**
CPCL	
CPCL, Chennai	10500
CPCL, Narimanam	1000
CPCL,Total	**11500**
Others	
NRL, Numaligarh	**3000**
ONGC, Tatipaka	100
MRPL, Mangalore	15000
ONGC Total	**15100**
TOTAL PSU	**134450**
PVT	
RIL, Jamnagar	33000
RPL (SEZ), Jamnagar	27000
EOL, Jamnagar	20000
PVT Total	**80000**
ALL INDIA TOTAL	**214450**

From the above data, the refining capacity for North India is presented in ***Table 2-2***.

Table 2-2: Refineries with Installed Capacity in Northern India

REFINERIES	CAPACITY (TMTPA)
IOC, Mathura	8000
IOC, Panipat	15000

HMEL,GGSR	9000
BPCL Bina	6000
NORTH INDIA TOTAL	**38000**

The region wise sales (consumption) in the area (as published by PPAC, MOP&NG, Govt. of India in Ready Reckoner dated June' 2015) is presented in ***Table 2-3***.

Table 2-3: Region wise sales (Consumption) of the area

STATE	SALES (CONSUMPTION) IN TMT
REGION NORTH	
JAMMU & KASHMIR	1201.3
PUNJAB	5713.5
RAJASTHAN	10879.4
UTTAR PRADESH	13346.9
HARYANA	10586.1
HIMACHAL PRADESH	1246.9
UTTARAKHAND	1303.2
CHANDIGARH	405.3
DELHI	4517.0
Region Total	**49199.6**
REGION NORTHEAST	
ASSAM	1905.4
MANIPUR	173.3
MEGHALAYA	422.4
NAGALAND	120.3
TRIPURA	190.3
ARUNACHAL PRADESH	177.7
MIZORAM	107.4
Region Total	**3096.8**
REGION EAST	
BIHAR	4107.5
ODISHA	3926.5
WEST BENGAL	6447.9
JHARKHAND	2627.1
SIKKIM	92.9
ANDMAN & NIKOBAR	171.7
Region Total	**17373.6**
REGION WEST	
GOA	686.3
GUJARAT	17644.3
MADHYA PRADESH	6433.5
MAHARASHTRA	16916.5
CHHATTISGARH	2553.3
DADRA & NAGAR HAVELI	376.4

STATE	SALES (CONSUMPTION) IN TMT
DAMAN & DIU	157.2
Region Total	**44767.5**
REGION SOUTH	
ANDHRA PRADESH	6264.7
KERALA	5390.2
TAMILNADU	12210.3
TELANGANA	4821.8
KARNATAKA	9577.1
LAKSHADEEP	14.8
PUDUCHERRY	459.2
Region Total	**38738.1**
ALL INDIA TOTAL	**153175.6**

It can be seen that there exists a gap in demand in North India to the tune of **11199.6** TMTPA which is expected to grow further with time.

The above data shows the following:

- The actual demand in North India has far exceeded the refining capacity for the year 2014-15.
- There is a huge demand supply gap in North India to the tune of **17199.6** TMTPA.
- There is a further potential to increase refining capacity in North India.

2.5 Export Possibility

As the demand in the target area of sales for the project (North India) far outstrips the supply, any possibility of major POL products exports from the project appear a distant possibility at present. However, possibility to explore export markets for sale of specific products that are in surplus in the North Indian region as well as in the country can be thought of.

Nevertheless, the purpose of the proposed project is to support the production of GGSR and by itself does not envisage any processing or production facilities, thus is incapable of any product sales and thus exports.

2.6 Employment Generation (Direct and Indirect) due to the project

Some employment will be generated due to the project like employment of local people for the project by the company or its contractors, which will provide additional employment and livelihood opportunities to the local people. The project will also benefit local businesses like eateries, grocery shops, transporters, tools & tackles suppliers, equipment suppliers, construction material suppliers & traders etc. This will add to the wellbeing of nearby communities.

3 PROJECT DESCRIPTION

3.1 Type of Project including Interlinked and Interdependent Projects, if any

The Mundra – Bathinda pipeline presently transports imported crude oil blends from Mundra Port to Guru Gobind Singh Refinery of HMEL at an installed capacity of 9 MMTPA with its head pumping station (also called dispatch terminal or DT) at Khasra no. 141/P, Village Mundra, Taluka Mundra, District Kutch in Gujarat and an intermediate pumping station (also called IPS-3) at Survey Nos. 152, 156, 157, 172, 173, Village Dhansa, Tehsil Jaswantpura, District Jalore in Rajasthan with provisions to expand its capacity to 18 MMTPA by converting its four intermediate pigging stations into pumping stations. The four intermediate pigging stations are located as under along the pipeline and have sufficient land for conversion into pumping stations.

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In the proposed project, the two of the four intermediate pigging stations of MBPL are proposed to be converted into pumping stations as under :

a) One among IPS-1 & IPS-2 will be selected for conversion based on engineering studies.
b) One among IPS-4 & IPS-5 will be selected for conversion based on engineering studies.

The project does not involve procurement or acquisition of any additional land for the pumping stations. No change in the route of the pipeline or any material changes to the pipeline is required for this capacity expansion.

3.2 Location (map showing general location, Specific Location and Project Boundary & Project lay out) with Coordinates

Map showing general location, specific location and Project boundary &Project layout is already given in Form-I.

Table 3-1: Geographical Information of the Station Locations

Sl. No.	Station	Land Area (m^2)	Coordinates	
1	DT	Within Crude Oil Terminal premises	Latitude (approximately)	22° 47' 41" N
			Longitude (approximately)	69° 42' 05" E
2	IPS-1	56008	Latitude (approximately)	23° 26' 54" N
			Longitude (approximately)	70° 40' 16" E
3	IPS-2	54311	Latitude (approximately)	24O 05′ 59″ N
			Longitude (approximately)	71O 53′ 51″ E
4	IPS-3	50535	Latitude (approximately)	25° 13' 04" N
			Longitude (approximately)	72° 22' 45" E
5	IPS-4	50090	Latitude (approximately)	26° 35' 03" N
			Longitude (approximately)	73° 01' 48" E

6	IPS-5	50100	Latitude (approximately)	28° 10' 48" N
			Longitude (approximately)	73° 58' 47" E
7	RT	Within Refinery Premises	Latitude (approximately)	29° 54' 55" N
			Longitude (approximately)	74° 56' 43" E

3.3 Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted

Alternate sites for the project have not been considered for the following reasons:

- Selection of other site would have involved new land acquisition/purchase, thus would not be cost effective.
- Selection of other site would have involved conversion of agricultural land into industrial land use and farmers would have been affected.
- Selection of other site would have involved de-vegetating of new area which is not required for the selected site.
- The selected sites falls on the route of MBPL and are being used as pigging stations, thus construction of facilities would be easy as compared to selection of another site that may require development of new approach road, infrastructure and may involve diverting the already laid MBPL through that land which would be a time consuming and costly affair and may cause spillage of crude oil into the environment.

The above difficulties are not encountered in the selected sites.

3.4 Size or Magnitude of Operation

The size of the project is as under:

Additional pumping facilities will be added to the existing pigging facilities at these existing NA converted industrial land plots and will be commissioned inline without any interruption to the existing operations.

3.5 Project Description with Process Details

The broad scope of the project cover the following facilities that are envisaged for the Project:

- Basket Filters, Mainline Pumps along with its accessories, with associated Piping, Instruments and Control system will be added to the existing facilities at two of HMPL's existing intermediate pigging stations.
- A Fire Hydrant network system with jockey pumps system for the pumping stations & associated facilities will be added.

3.6 Raw material required along with Estimated Quantity, likely Source, Marketing area of Final Products, Mode of transport of Raw material and Finished Products

The project involves facilities for transportation of crude oil. The project does not involve any Raw Material, processing/manufacturing and finished product.

3.7 Resource Optimization / Recycling and Reuse envisaged in the Project, if any should be briefly outlined

Not applicable.

3.8 Availability of Water its Source, Energy/Power requirement and Source should be given

Approximately 24.2 KLD water will be required for operating each of these two facilities including the green belt. Groundwater is present at the site and will be used for the project after due clearance from the Central Ground Water Authority.

Approximately 6000KVA power will be required for operating each of these two facilities. This power requirement will be met from the Grid through dedicated feeder from the nearest GETCO substation. During power outages, to meet the power requirement of the essential facilities, a 320 KVA DG set will be provided each of these two stations as emergency back-up.

3.8.1 Water Consumption

Water requirement for each of these two stations of the proposed project will be 24.2 KLD. The details of water requirement and effluent generation are presented in ***Table 3-2***.

Table 3-2: Water and Wastewater Quality-Domestic and Industrial

S.No.	Area		Water Consumption (KLD)	Effluent Generation (KLD)	Disposal Mode
1	Domestic		2.7	2.43	Soak Pit
2	Industrial	Processing	NA	NA	NA
		Cooling	NA	NA	NA
		Boiler	NA	NA	NA
		Fire Water	1	NA	Evaporation Loss
3	RO		NA	NA	NA
4	Gardening		20.5	0	NA
	Total for one station		**24.2**	**2.43**	
	Total for two station		**48.4**	**4.86**	

3.8.2 Fuel

Details of fuel consumption are given in ***Table 3-3***.

Table 3-3: Details of Fuel Consumption

Sr. No.	Stack Attached to	Quantity	Type of Fuel used	Height from Ground Level (m)	Fuel consumption per machine
1	320 KVA DG Set	1 x 2 stations = 2	Diesel	12.5	64 liters/hour
2	284 KW Fire Water Engines	3 x 2 stations = 6	Diesel	13	75 liters/hour

3.9 Quantity of Waste to be generated (Liquid and Solid) and Scheme for their Management /Disposal

Details about the Solid Hazardous Waste Management are given in ***Table 3-4***.

Table 3-4: Solid and Hazardous Wastes for each pumping station, with Type, Mode and Disposal

S. No.	Items	Category as per HW Rules	Unit	Quantity	Treatment / Disposal Method
1	Pigging Waste	3.3	MT/ month	0.5	TSDF
2	Sludge from Tank Cleaning, used Filter Elements	3.3	Tons / 5 Years	2	TSDF
3	Used Lube Oil	5.1	MT/year	2	Authorised Recyclers
4	Used Pig Cups/Discarded Containers/Barrels	33.3	Nos./year	16 pig cups 5 Discarded Containers/Barrels	TSDF

For two pumping stations, twice the above mentioned quantities should be considered for the purpose of this proposed project.

For liquid waste please refer Table 3-2***.***

3.10 Representation of the Feasibility which give Information of EIA purpose

The purpose of the study is to comply with legal requirements as per category 6(b) of Environmental Impact Assessment (EIA) Notification, 2006 (and subsequent amendments) of Ministry of Environment and Forests and Climate Change (MoEF&CC) since it involves handling of hazardous chemicals (crude oil) covered under schedules 2 & 3 of MSIHC Rules 1989 amended 2000.

4 SITE ANALYSIS

4.1 Connectivity

The proposed site locations are given in Section 2.2 and Table 3.1.

Distance of the nearest key infrastructure features from the sites are given in Section III (Environmental Sensitivity) of Form-I:

4.2 Land Form, Land Use and Land ownership

The pumping stations will be built on existing intermediate pigging station land plots owned by HPCL-Mittal Pipelines Limited .

- Land Form: The areas are flat and do not have a pronounced slope.
- Land Use : Industrial (Pigging facilities of MBPL exist on the land plots)
- Land Ownership : The land plots are owned by M/s HPCL Mittal Pipelines Ltd

4.3 Topography (along with map)

The topographic and geological information of the proposed project areas are given below while the maps are shown in Annexure-2 of Form-I.

	IPS-1	**IPS-2**	**IPS-3**	**IPS-4**	**IPS-5**
Groundwater Level	In the study area, the general water depth is in between 20-40 m.	In the study area, the general water depth is in between 40-80 m.	In the study area, the general water depth is in between 20-40 m.	In the study area, the general water depth is in between 20-40 m.	In the study area, the general water depth is in between 80-113 m.
Soil Quality	Geologically Alluvium, Tertiary, Mesozoic Sandstones is found in the area. The general land use of the study area is of Arable Land Unirrigated type involving some Wastelands with a general slope of less than 10 m. Layer–I thickness in general is 5.2 to 6.00m and comprises Silty	Geologically Alluvium and Blown Sand is found in the area. The general land use of the study area is of Arable Land Unirrigated type involving some Wastelands with a general slope of less than 10 m. Mainly Ochrepts type of soil is present in the area. Layer-I is essentially stratified (viz.)	Geologically sandy loam is found in the area. The general land use of the study area is of Arable Land Unirrigated type involving some Wastelands with a general slope of less than 10 m. Layer–I thickness in general is 4.50 to 5.00m and comprises Silty Sand/Sandy Silt with gravels	Geologically sandy and sandy loam soils are found in the area. The general land use of the study area is of Arable Land Unirrigated type involving some Wastelands with a general slope of less than 10 m. Layer–I thickness in general is 0.3 to 0.5m and comprises	Geologically sandy and sandy silt soils are found in the area. The general land use of the study area is of desert land Unirrigated type with 3 to 5m high sand dunes. Layer–I thickness in general is 4m to 4.5m and comprises Silty Sand with Recorded 'N' values upto 2m is less

	Sand/Sandy Silt with gravels/ Clay binder with SPT'N' values vary from 35 to as high as '>100' indicating 'Dense to Very Dense ' in-situ compactness and thereafter Layer-II comprises Moderately Weathered rock with RQD is in range of 10 to 58 indicating 'Poor to Fair quality' rock	comprises Silty Sand with clay Binder /Clayey Silt stratified with sand. Recorded 'N' values vary from 12 to 40 with progressive depths upto 5.5m and thereafter Very Dense Silty Sand with Gravels with Recorded SPT'N' Values are consistently high and vary from 53 to as high as '>100' indicating 'Dense to Very Dense 'in-situ compactness	/Stratified Clayey Silt /Sand with Recorded 'N' values vary from 11 to 35 indicating a gradual transition from 'medium to dense compactness and thereafter Layer-II comprises Very Dense Silty Sand with Gravels with Recorded SPT'N' Values are consistently high and vary from >35 to as high as '>100' indicating 'Dense to Very Dense 'in-situ compactness	Silty Sand thereafter Layer-II comprises Sandstone with core recovery of 13 to 96% & RQD of Nil to 25 indicating 'Very Poor to Poor Quality Rock	than 15 after which recorded 'N' Values vary from vary from 14 to 35 indicating a gradual transition from 'medium to dense compactness upto 4.5m and thereafter Layer-II comprises Dense to Very Dense Silty Sand with Gravels with Recorded SPT'N' Values are consistently high and vary from >35 to as high as '>100' indicating 'Dense to Very Dense 'in-situ compactness
Climate	Arid (Tropical Desert, Arid, Hot) climatic condition prevails in the study area.	Semi-Arid (Tropical Desert, Arid, Hot) climatic condition prevails in the study area.	Arid (Tropical Desert, Arid, Hot) climatic condition prevails in the study area.	Arid (Desert, Arid, Hot) climatic condition prevails in the study area.	Arid (Desert, Arid, Hot) climatic condition prevails in the study area.
Temperature range	Max. 41.9oC Min. 08.7oC	Max. 41.4oC Min. 10.5oC	Max. 40.0oC Min. 10.5oC	Max. 40.8oC Min. 08.0oC	Max. 41.4oC Min. 06.4oC
Annual average rainfall	406mm	560mm	529mm	266mm	276mm

4.4 Existing Landuse Pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distances from the periphery of the Project to periphery of the Forests, National Park, Wildlife Sanctuary, Eco-sensitive areas, Water-bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.

Land Use: The land use in the broad areas in which the intermediate pigging stations exist are predominately agricultural except for IPS-5 where vegetation is negligible while the land plots on which these stations exist have already been converted for industrial use.

Other information like distance from various sensitive areas is summarized in Section III (Environmental Sensitivity) of Form-I.

Existing Infrastructure at each of these stations: Pigging facilities and cathodic protection facilities, telecom repeater facilities along with DG sets for power back-up and Grid Power Supply (136 kVA)

4.5 Soil classification

A Two layered Sub-soil profile is noticed upto explored depth. Please refer section 4.3 above for details.

4.6 Climatic Data from Secondary Sources

Please refer section 4.3 above.

4.7 Social Infrastructure Available

Not applicable, since the project is only for a pumping stations.

5 PLANNING BRIEF

5.1 Water

~48.4 KLD of fresh water will be required in total for the two stations. This will be sourced from the ground water, after taking requisite permission from the CGWA (i.e. the Competent Authority).

5.2 Effluent Generation and Disposal

No effluent will be generated. Sewage will be generated and disposed in soak pits.

5.3 Power Requirement

Total power will be required ~6000 KVA x 2 stations = 12000 KVA. This will mainly be required for pumping requirements for the crude and lighting requirements for the stations.

5.4 Air Emission

Please refer ***Section 3.8.2***.

6 PROPOSED INFRASTRUCTURE

6.1 Industrial Area (processing area)

The land plots at these stations are entirely for industrial purposes and no other area is allotted for non-industrial purposes.

6.2 Residential Area (non-processing area)

Not applicable, since no residential area is envisaged.

6.3 Green Belt

~25%of the plot area will be kept for greenbelt purposes.

6.4 Social Infrastructure

Not applicable, since this is a minor project for managing the crude transportation through pipeline.

6.5 Connectivity (Traffic and transportation road/ rail/metro/water ways etc)

Please refer ***Section 4.1***.

6.6 Drinking Water Management (source & supply of water)

Please refer ***Section 3.8***.

6.7 Sewage system

Please refer ***Section 3.9***

6.8 Industrial Waste Management

Please refer ***Table 3-4.***

6.9 Solid Waste Management

Please refer ***Table 3-4.***

6.10 Power Requirement &Supply/ Source

Please refer ***Section 5.3***.

7 REHABILITATION AND RESETTLEMENT (R&R) PLAN

7.1 Policy to be adopted (Central/State) in respect of the Project affected Persons including Home oustees, Land oustees and Landless laborers (a brief outline to be given)

The entire area covered within the Project is uninhabited, without any homesteads whatsoever and the land is completely owned by HMPL. As there is no displacement of population for the project, and the land is completely owned by HMPL, Rehabilitation and Resettlement (R&R) Plan vis-à-vis rehabilitating or resettling home oustees, land oustees and landless laborers is not applicable.

8 PROJECT SCHEDULE & COST ESTIMATES

8.1 Likely Date of Start of Construction and Likely Date of Completion (time schedule for the project to be given)

Likely date of start of construction: November, 2016

Likely date of completion: November, 2018

8.2 Estimated Project Cost of the Project.

Estimated project cost is ~INR 120 x 2 stations = INR 240 crores.

9 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

9.1 Financial and Social Benefits with Special Emphasis on the Benefit to the Local People Including Tribal Population, if any, in the Area

Some employment will be generated due to the project like employment of local people for the project by the company or its contractors, which will provide additional employment and livelihood opportunities to the local people. The project will also benefit local businesses like eateries, grocery shops, transporters, tools & tackles suppliers, equipment suppliers, construction material suppliers & traders etc. This will add to the wellbeing of nearby communities.

9.1.1 Local Employment

During Construction Phase

~200 people will be required for approx. two years.

During Operational Phase

<28 highly skilled people will be required.