

## APPENDIX

(See Rule – 6)

Form for seeking prior approval under section 2 of the proposals by the State Government and other authorities.

### PART-I

(To be filled up by user agency)

1. Location of the project/scheme

i. Short narrative of the project and project/scheme for which the forest land is required.

Jindal Steel and Power Limited (JSPL) is one of India's major steel producers with a significant presence in sectors like Mining, Power Generation and Infrastructure.

Jindal Steel and Power Limited (JSPL) is setting up a Green field Integrated steel plant in Angul, Odisha. The proposed steel plant to be set up in Odisha will produce 12.5 MTPA steel and generate 2600 MW of power in phases. In the first phase, the company is setting up a 6 MTPA integrated steel plant and in the second phase, the proposal is to expand another 6.5 MTPA of capacities in the steel plant.

In order to meet the raw material requirement of the Integrated Steel Plant, JSPL proposes to lay a Slurry Pipeline from Barbil to Steel plant in Angul to transport Iron ore in the form of slurry.

Steel has probably the widest range of applications of any material. The wide range of alloy compositions, mechanical properties and product forms available make it a versatile material that is used in components and products that may be small or large, high-tech or low-tech, every day or specialist.

In short it can be safely concluded that, nothing is manufactured, processed or transported without steel.

The private sector of the Steel Industry is currently playing an important role in production and growth of steel industry in the country. They not only play an important role in production of primary and secondary steel, but also contribute substantial value addition in terms of quality, innovation and cost effectiveness.

To fulfil the increased requirement of raw material for 12.5 MTPA integrated steel plant, JSPL is planning to lay Iron Ore Slurry Pipeline from Barbil to Steel Plant at Angul. The output will be used in Pellet plant & Sinter Plant of JSPL Steel Plant located at Angul. The output from the Pellet plant and Sinter plant will further be utilized to produce sponge iron & pig iron which then be used in making steel.

In this mode of transportation of ore by pipeline, the solids are first ground to fine grain size and made into slurry with a liquid medium. The slurry is then pumped through the pipes to a desired destination.



Authorised Signatory

Anurag Tripathy

AGM-Slurry Pipeline Project

Jindal Steel & Power Limited

Angul Odisha

Slurry pipeline transportation is particularly advantageous in those processes where the raw material is to be first pulverized for further processing such as iron ores meant for palletisation and Sintering.

Slurry pipelines have advantages over other modes of solids transportation, as nearly all facilities are buried and out of sight with only a few widely separated surface structures. A minimum of land is used by the narrow direct right-of-way which is restored to its previous condition after the pipeline is laid. Slurry pipelines are environmentally preferred, as they do not cause noise, dust pollution or negative visual impacts. More efficient use of energy results in lower greenhouse gas emissions than alternate transport options.

Compared to normal surface mode like railways and road vehicles, the following advantages are particularly attractive

- a. They do not require the return of 'empties' to the starting point and as such are ideal for uni-directional traffic.
- b. They are insensitive to surface conditions such as storms, inclement weather, etc.
- c. Operating costs are low.
- d. Capital cost being the major cost of pipeline transportation inflationary influences have a small effect on transport cost.
- e. They are environmentally friendly.

Hence, overall no negative impact on the socio economic environment is anticipated.

The length of the proposed pipeline is 199 Km (approx.). The route traverses through two districts Keonjhar & Angul with three Forest Divisions Keonjhar, **Deogarh** & Angul of Odisha State. The entire route of slurry pipeline is proposed to be laid in the utility corridor of the National Highways, State Highways and that of ODRs in the above mentioned districts.

The Brief Summary is given below

Sr. No.	Division	Districts	Length (Km)	Remarks
1	Keonjhar	Keonjhar	76.000	
2	<b>Deogarh</b>	<b>Angul</b>	<b>70.400</b>	
3	Angul	Angul	52.200	
		Total	198.600	

- ii. **Map showing the required forest land boundary and adjoin forest on a 1:50,000 scale map.**





Following maps of Survey of India toposheets with scale 1:50000 showing pipeline route have been enclosed with the Part-I of Forest Diversion Proposal.

Sr. no.	Toposheet No. (new)	Toposheet No. (old)	District	Division	Sheet No.	Remarks
1	F45N6	73 G/06	Angul	Deogarh	Sheet No. 3	
2	F45N7	73 G/07	Angul	Deogarh	Sheet No. 4	
3	F45N3	73 G/03	Angul	Deogarh	Sheet No. 5	
4	F45N4	73 G/04	Angul	Deogarh	Sheet No. 6	

iii. **Cost of the Project.**

Sr. No.	Details	Rs (In Crores)
1	Obtaining Statutory Clearances from various government bodies.	31.00
2	Engineering, Supervision, Commissioning etc.	14.00
3	Material Supply (pipes, pumps etc.)	358.00
4	Construction, Erection up till completion of work	250.00
	<b>Total</b>	<b>653.00</b>

iv. **Justification for locating the project in forest area.**

**1. Reduction in greenhouse emissions & load on existing infrastructure of road & railways.**

To meet the raw material requirement of the Integrated Steel Plant, JSPL proposes to lay a Slurry Pipeline from Barbil to Steel plant in Angul to transport Iron ore of 12 MTPA capacity in the form of slurry.

Slurry pipelines offer an economic advantage over railroad and much less noise disturbance to the environment, particularly when mines are in extremely remote areas. Slurry transportation through pipeline will subsequently reduce Rail & Road Traffic Density.

Pipelines form a unique mode of transportation. They can move large quantities of certain types of commodities, mainly fluids, over long distances at relatively low cost. The operations are environmentally friendly, dependable and continuous. The pipelines can be laid on a wide variety of terrains without much difficulty.

*For example for 12 MTPA the no of trucks required per day is 2192 (considering 365 days per year with no holidays) and the no of trucks required per hour is 91 trucks (15 MT Capacity) and no of racks per day is 15 racks/day.*

Considering the above it is very clear that the transportation of Iron Ore by Slurry form will reduce considerable load on the existing infrastructure of road and railways which in turn will considerably reduce greenhouse gas emissions.

Also, in order to cater to this huge amount of raw material transportation the existing infrastructure needs to be upgraded which will result in increase in expenditure.

*Also, the reduction in greenhouse emissions compared to road transportation is about 8:1 and that compared to railway transportation is about 6:1*

***Hence, Slurry pipelines have advantages over other modes of solids transportation, as nearly all facilities are buried and out of sight with only a few widely separated surface structures. A minimum of land is used by the narrow direct right-of-way which is restored to its previous condition after the pipeline is laid. Slurry pipelines are environmentally preferred, as they do not cause noise, dust pollution or negative visual impacts. More efficient use of energy results in lower greenhouse gas emissions than alternate transport options.***

**2. Optimisation of route so that least amount of forest land is involved in the project compared to other alternate routes.**

M/s Jindal Steel & Power Ltd. has surveyed three alternative routes for laying of Iron Ore Slurry Pipeline from Barbil to Angul based on the following main criteria:

1. Route selected should be the shortest possible one.
2. Avoid environmentally sensitive areas such as Reserved Forests, Protected Forests, Wildlife areas, Marine parks, Bird sanctuaries, etc. to the maximum possible extent.
3. Should be accessible from Road during construction and the subsequent operation / maintenance stages.
4. Select easy and favourable terrain conditions – avoiding water logged and swampy areas, ravines, meandering rivers, low lying marshy areas, unstable ground, depressions, hard rock, boulders, rock outcrops areas etc. to the maximum possible extent.

After considering the above criteria three alternative routes were identified wherein:

5. Alternate-II has the minimum length of 161.918 Km and Alternate-I has maximum length of 198.560 Km.
6. Alternate-I has the minimum Forest Length of 11.608 Km in comparison to Alternate-II – 58.974 Km & Alternate-III – 26.144.

Sr. No.	Alt. I			Alt. II			Alt. III		
	Total line length	Total RF/PF length	Area of RF/PF	Total line length	Total RF/PF length	Area of RF/PF	Total line length	Total RF/PF length	Area of RF/PF
	Kms.	Kms.	Ha.	Kms.	Kms.	Ha.	Kms.	Kms.	Ha.
1	198.560	11.608	1.393	161.918	58.974	7.077	185.941	26.144	3.137

Considering the above Alternate-I was recommended with least forest area.

Hence, it is justified to lay Iron Ore Slurry Pipeline along Alternate-I with least Forest Area





v. **Cost-benefit analysis.**

**Not applicable for the project.**

vi. **Employment likely to be generated.**

Employment opportunity will be generated during implementation of the project.

There will be permanent employment of 50 persons including Sr. Executives, Managers, Administrators, Engineers, Supervisors and Skilled Technicians.

The Unskilled labours will be recruited from the local area and surroundings during the construction period and approximately 250 workforces will be engaged.

In addition to direct employment, proposed project shall generate number of indirect job opportunities on local and regional basis.

2. **Purpose wise beak-up of the total land required.**

Sr. No	Purpose	Forest land in Ha						Non-Forest land in Ha			Grand Total in Ha
		Reserved Forest (Ha)	Village Forest (Ha)	DLC (Ha)	Revenue Forest with kissam (Ha)	Sabik Kissam Jungle	Total (Ha)	Govt. Non-Forest Land (Ha)	Private Land (Ha)	Total (Ha)	
1	Slurry Pipeline in Deogarh Division	1.016	0.016	0.085	0.220	0.000	1.337	7.026	0.289	7.315	8.652

3. **Details of displacement of people due to the project, if any.**

(i) Number of families – **NIL.**

(ii) Number of Schedule Castes / Scheduled Tribe families. –**NIL.**

(iii) Rehabilitation plan (to be enclosed) – As the families are not displaced so there will be no Rehabilitation. Hence plan is not required.

4. **Whether clearance under the Environment (Protection) Act, 1986 required? (Yes/No)**

No,

However, the Consent to Establish is required and has been obtained.

5. **Undertaking to bear the cost of raising and maintenance of compensatory afforestation and/ or penal compensatory afforestation as well as cost for protection and regeneration of Safety Zone, etc. as per the scheme prepared by the State Government (undertaking to be enclosed)**

M/s Jindal Steel & Power Ltd., hereby, undertake to pay the entire amount for compensatory afforestation in lieu of the forest area diverted for Barbil – Angul Iron Ore Slurry Pipeline Project as per prevailing wage at the time of plantation.

**6. Details of certificates/documents enclosed as required under the instructions.**

**MAPS & PLATES**

Sl No	Details of Maps and Plates annexed	Provided or not	If not provided why	Page Number
1	Survey of India Toposheet - F 45 N6 (73 G/6), Scale 1 : 50000 Showing Slurry Pipeline Route - Sheet No. 3	Yes	--	1
2	Survey of India Toposheet - F 45 N7 (73 G/7), Scale 1 : 50000 Showing Slurry Pipeline Route - Sheet No. 4	Yes	--	1
3	Survey of India Toposheet - F 45 N3 (73 G/3), Scale 1 : 50000 Showing Slurry Pipeline Route - Sheet No. 5	Yes	--	1
4	Survey of India Toposheet - F 45 N4 (73 G/4), Scale 1 : 50000 Showing Slurry Pipeline Route - Sheet No. 6	Yes	--	1
5	Survey of India Toposheet - F 45 N6 (73 G/6), Scale 1 : 50000 Showing 3 alternate routes studied for Slurry Pipeline Project - Sheet No. 11	Yes	--	1
6	Survey of India Toposheet - F 45 N7 (73 G/7), Scale 1 : 50000 Showing 3 alternate routes studied for Slurry Pipeline Project - Sheet No. 12	Yes	--	1
7	Survey of India Toposheet - F 45 N3 (73 G/3), Scale 1 : 50000 Showing 3 alternate routes studied for Slurry Pipeline Project - Sheet No. 13	Yes	--	1
8	Survey of India Toposheet - F 45 N4 (73 G/4), Scale 1 : 50000 Showing 3 alternate routes studied for Slurry Pipeline Project - Sheet No. 14	Yes	--	1
9	DGPS Index Map showing Forest area in Deogarh Forest Division.	Yes	--	1
10	DGPS Map showing pipeline route in Paudi RF – Plate 1 (Deogarh Division)	Yes	--	1
11	DGPS Map showing pipeline route in Paudi RF – Plate 2 (Deogarh Division)	Yes	--	1
12	DGPS Map showing pipeline route in Kakharua PF – Plate 3 (Deogarh Division)	Yes	--	1
13	DGPS Map showing pipeline route in Bankadhar PF – Plate 4 (Deogarh Division)	Yes	--	1
14	DGPS Map showing pipeline route in Village Balibahal Sheet No. 1 – Plate 5 (Deogarh Division)	Yes	--	1
15	DGPS Map showing pipeline route in Village Nagira Sheet No. 1 – Plate 6 (Deogarh Division)	Yes	--	1
16	DGPS Map showing pipeline route in Village Nagira Sheet No. 4 – Plate 7 (Deogarh Division)	Yes	--	1
17	DGPS Map showing pipeline route in Village Nagira Sheet No. 5 – Plate 8 (Deogarh Division)	Yes	--	1
18	DGPS Map showing pipeline route in Village Rugudidihi Sheet No. 7 – Plate 9 (Deogarh Division)	Yes	--	1
19	DGPS Map showing pipeline route in Village Kantala Sheet No. 1 – Plate 10 (Deogarh Division)	Yes	--	1
20	DGPS Map showing pipeline route in Village Muktapur Sheet No. 1 – Plate 11 (Deogarh Division)	Yes	--	1
21	Authenticated Village Map showing Pipeline Route in Village Sibida. Sheet No. 4	Yes	--	1

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Sl No	Details of Maps and Plates annexed	Provided or not	If not provided why	Page Number
22	Authenticated Village Map showing Pipeline Route in Village Sibida. Sheet No. 1	Yes	--	1
23	Authenticated Village Map showing Pipeline Route in Village Sibida. Sheet No. 3	Yes	--	1
24	Authenticated Village Map showing Pipeline Route in Village Balibahal. Sheet No. 1	Yes	--	1
25	Authenticated Village Map showing Pipeline Route in Village Balibahal. Sheet No. 2	Yes	--	1
26	Authenticated Village Map showing Pipeline Route in Village Balibahal. Sheet No. 4	Yes	--	1
27	Authenticated Village Map showing Pipeline Route in Village Nagira. Sheet No. 1	Yes	--	1
28	Authenticated Village Map showing Pipeline Route in Village Nagira. Sheet No. 1	Yes	--	1
29	Authenticated Village Map showing Pipeline Route in Village Nagira. Sheet No. 4	Yes	--	1
30	Authenticated Village Map showing Pipeline Route in Village Nagira. Sheet No. 5	Yes	--	1
31	Authenticated Village Map showing Pipeline Route in Village Nagira. Sheet No. 1	Yes	--	1
32	Authenticated Village Map showing Pipeline Route in Village Rugudidiha. Sheet No. 1	Yes	--	1
33	Authenticated Village Map showing Pipeline Route in Village Rugudidiha. Sheet No. 4	Yes	--	1
34	Authenticated Village Map showing Pipeline Route in Village Rugudidiha. Sheet No. 5	Yes	--	1
35	Authenticated Village Map showing Pipeline Route in Village Rugudidiha. Sheet No. 7	Yes	--	1
36	Authenticated Village Map showing Pipeline Route in Village Dudipani. Sheet No. 2	Yes	--	1
37	Authenticated Village Map showing Pipeline Route in Village Dudipani. Sheet No. 1	Yes	--	1
38	Authenticated Village Map showing Pipeline Route in Village Jamaradiha (38)	Yes	--	1
39	Authenticated Village Map showing Pipeline Route in Village Jamaradiha (33). Sheet No. 3	Yes	--	1
40	Authenticated Village Map showing Pipeline Route in Village Jamaradiha (33). Sheet No. 4	Yes	--	1
41	Authenticated Village Map showing Pipeline Route in Village Saída. Sheet No. 1	Yes	--	1
42	Authenticated Village Map showing Pipeline Route in Village Saída. Sheet No. 3	Yes	--	1
43	Authenticated Village Map showing Pipeline Route in Village Dalo. Sheet No. 1	Yes	--	1
44	Authenticated Village Map showing Pipeline Route in Village Dalo. Sheet No. 2	Yes	--	1
45	Authenticated Village Map showing Pipeline Route in Village Sarabeda. Sheet No. 1	Yes	--	1
46	Authenticated Village Map showing Pipeline Route in Village Kantala. Sheet No. 2	Yes	--	1
47	Authenticated Village Map showing Pipeline Route in Village Kantala. Sheet No. 1	Yes	--	1
48	Authenticated Village Map showing Pipeline Route in Village Muktapur. Sheet No. 1	Yes	--	1

Sl No	Details of Maps and Plates annexed	Provided or not	If not provided why	Page Number
49	Authenticated Village Map showing Pipeline Route in Village Muktapur. Sheet No. 2	Yes	--	1
50	Authenticated Village Map showing Pipeline Route in Village Pallahada. Sheet No. 6	Yes	--	1
51	Authenticated Village Map showing Pipeline Route in Village Pallahada. Sheet No. 5	Yes	--	1
52	Authenticated Village Map showing Pipeline Route in Village Pallahada. Sheet No. 1	Yes	--	1
53	Authenticated Village Map showing Pipeline Route in Village Pallahada. Sheet No. 7	Yes	--	1
54	Authenticated Village Map showing Pipeline Route in Village Pallahada. Sheet No. 3	Yes	--	1
55	Authenticated Village Map showing Pipeline Route in Village Khetrabasipur	Yes	--	1
56	Authenticated Village Map showing Pipeline Route in Village Jhimiripali. Sheet No. 1	Yes	--	1
57	Authenticated Village Map showing Pipeline Route in Village Jhimiripali. Sheet No. 3	Yes	--	1
58	Authenticated Village Map showing Pipeline Route in Village Jhimiripali. Sheet No. 4	Yes	--	1
59	Authenticated Village Map showing Pipeline Route in Village Bagdari	Yes	--	1
60	Authenticated Village Map showing Pipeline Route in Village Batishuan. Sheet No. 1	Yes	--	1
61	Authenticated Village Map showing Pipeline Route in Village Batishuan. Sheet No. 2	Yes	--	1
62	Authenticated Village Map showing Pipeline Route in Village Batishuan. Sheet No. 3	Yes	--	1
63	Authenticated Village Map showing Pipeline Route in Village Batishuan. Sheet No. 5	Yes	--	1
64	Authenticated Village Map showing Pipeline Route in Village Purunapani. Sheet No. 1	Yes	--	1
65	Authenticated Village Map showing Pipeline Route in Village Balipasi. Sheet No. 1	Yes	--	1
66	Authenticated Village Map showing Pipeline Route in Village Balipasi. Sheet No. 2	Yes	--	1
67	Authenticated Village Map showing Pipeline Route in Village Banar	Yes	--	1
68	Authenticated Village Map showing Pipeline Route in Village Hatibindha	Yes	--	1
69	Authenticated Village Map showing Pipeline Route in Village Barkotia. Sheet No. 2	Yes	--	1
70	Authenticated Village Map showing Pipeline Route in Village Barkotia. Sheet No. 1	Yes	--	1
71	Authenticated Village Map showing Pipeline Route in Village Barkotia. Sheet No. 3	Yes	--	1
72	Authenticated Village Map showing Pipeline Route in Village Badasara. Sheet No. 4	Yes	--	1
73	Authenticated Village Map showing Pipeline Route in Village Badasara. Sheet No. 6	Yes	--	1
74	Authenticated Village Map showing Pipeline Route in Village Nimiribeda. Sheet No. 1	Yes	--	1
75	Authenticated Village Map showing Pipeline Route in Village Nimiribeda. Sheet No. 2	Yes	--	1



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76	Authenticated Village Map showing Pipeline Route in Village Khamar. Sheet No. 1	Yes	--	1
77	Authenticated Village Map showing Pipeline Route in Village Khamar. Sheet No. 2	Yes	--	1
78	Authenticated Village Map showing Pipeline Route in Village Sulia	Yes	--	1
79	Authenticated Village Map showing Pipeline Route in Village Kumbharagadi	Yes	--	1
80	Authenticated Village Map showing Pipeline Route in Village Nuthuripasi	Yes	--	1
81	Authenticated Village Map showing Pipeline Route in Village Satyabandha	Yes	--	1
82	Authenticated Village Map showing Pipeline Route in Village Kalanda. Sheet No. 2	Yes	--	1
83	Authenticated Village Map showing Pipeline Route in Village Kalanda. Sheet No. 1	Yes	--	1
84	Authenticated Village Map showing Pipeline Route in Village Kalanda. Sheet No. 3	Yes	--	1
85	Authenticated Village Map showing Pipeline Route in Village Nakatimunda	Yes	--	1
86	Authenticated Village Map showing Pipeline Route in Village Godaramunda. Sheet No. 1	Yes	--	1
87	Authenticated Village Map showing Pipeline Route in Village Godaramunda. Sheet No. 2	Yes	--	1
88	Authenticated Village Map showing Pipeline Route in Village Kantiapashi. Sheet No. 1	Yes	--	1
89	Authenticated Village Map showing Pipeline Route in Village Bankamunda	Yes	--	1
90	Authenticated Village Map showing Pipeline Route in Village Bhaluki	Yes	--	1

**Authorised Signatory**  
**Anurag Tripathy**  
 AGM-Slurry Pipeline Project  
 Jindal Steel & Power Limited  
 Angul Odisha