No. Ft. 48-5495/2021(FCA),
Forest Department, Himachal Pradesh

From: Pr. Chief Conservator of Forests (HoFF),
Himachal Pradesh Shimla-1.

To: The Regional Officer,
Integrated Regional Office GoI, MoEF&CC,
CGO Complex, Shivalik Khand, Longwood,
Shimla, Himachal Pradesh.

Dated Shimla-1, the 13 JUL 2022

Subject: **Diversion of 12.04 ha. of forest land in favour of Rail Vikas Nigam Ltd Chandigarh, 1st Floor, Railway Recruitment Board Building, Railway colony, for the construction of Bhanupali-Bilaspur-Beri New Rail line Phase-IV i.e. from Kms 52.015 to Kms. 62.900, within the jurisdiction of Bilaspur Forest Division, Distt. Bilaspur, Himachal Pradesh. (Online Proposal No. FP/HP/Rail/146861/2021).**

Sir,

Kindly refer to your office letter No.FC/HPC/07/14/2022/ dated 27.05.2022 on the subject cited above.

2. The reply to the observations as raised vide your letter under reference is submitted as under:-

1. a) The user agency has now included the 4.79 ha area of non forest land in the total non forest land and also uploaded in online part-I.
   b) The verified summary of land details as provided by Revenue officials has been uploaded in the additional information detail in online Part-1.
2. a) The layout plan duly authenticated by DFO concerned has been uploaded against additional information detail in Part-I by the user agency.
   b) In the layout plan, forest land has been marked in green and non forest land has been marked with red ink by user agency.
3. a) The user agency has intimated that the Bhanupali-Bilaspur-Beri New Rail line is a linear project for which the proceeding of Gram Sabha is exempted. Similar precedence has been followed in previous proposals in the project.
   b) The user agency has intimated that the SDO(c) –cum-Chairman, RFC vide office order No. BLS.SDM.RFC.2022-2183 dated 28.03.2022 after conducting necessary meetings has mentioned that:-
      (i) It is clear that no claim has been filed before the FRC nor any such claims are pending for disposal before Gram Sabha.
      (ii) No petition has been filed before SDLC by any person aggrieved by the resolution of Gram Sabha.
      Subsequently, the chairman SDLC has mentioned that the objections are not tenable, and NOC under FRA has been issued by SDLC and DLC.

PTO

4. The user agency has intimated that the components including beneficiary villages marked in distinct colors have been attached as soft copy in CD which is attached please.
5. The revised cost benefit analysis has now been updated in Part-I by user agency.
6. The muck management plan duly authenticated by DFO has been uploaded online against additional information detail in Part-1.

Yours faithfully,

Nodal Officer-cum-APCCF (FCA)
O/o Pr. CCF (HoFF), H.P.

Encls: As above

सूची गांववार निजी भूमि /मलकीयत सरकार (52 कि0मी0 से 63 कि0मी0) तहसील सदर, जिला बिलासपुर हि0प्र0।

जेर आमदा भानुपली–बिलासपुर–बैरी न्यू बी0जी0 रेलवे लाईन

(द्वितीय अनुभाग)

क्र0	गांव	निजी भूमि		कुल रकवा (बीघा में)	हैक्ट्र	मलकीयत सरकार						कुल रकवा (बीघा में)	हैक्ट्र	कुल जोड़ (बीघा में)	कुल (हैक्ट्र में)
		भू–स्वामी	ए0सी0सी0			चरान्द आदि	BBMB	PWD	विद्युत विभाग	राज्य विद्युत परिषद	केन्द्रीय सरकार				
1	नोग	60-6	-	60-6	4.54	28-15	1-1	-	-	-	-	29-16	2.24	90-2	6.78
2	बहली बिला	21-9	-	21-9	1.61	6-12	-	6-9	-	-	-	13-1	0.98	34-10	2.59
3	बहली झलेड़ा	4-0	-	4-0	0.30	0-3	-	-	-	-	-	0-3	0.01	4-3	0.31
4	मराथू	24-3	-	24-3	1.82	0-9	-	-	-	-	-	0-9	0.03	24-12	1.85
5	बघड़ी	22-9	-	22-9	1.69	3-16	-	-	-	-	-	3-16	0.29	26-5	1.98
6	बैरी रजादयां	0-7	-	0-7	0.03	-	-	-	-	-	-	-	-	0-7	0.03
7	खतोड़	194-6	15-16	210-2	15.81	31-19	3-7	25-10	-	-	-	60-16	4.58	270-18	20.39
8	भटेड़ उपरली	103-4	2-5	105-9	7.94	4-0	-	3-2	-	-	-	7-2	0.53	112-11	8.47
9	बरमाणा	91-8	21-2	112-10	8.46	16-3	-	-	0-12	0-8	0-18	18-1	1.36	130-11	9.82
कुल जोड़:–		521-12	39-3	560-15	42.20	91-17	4-8	35-1	0-12	0-8	0-18	133-4	10.02	693-19	52.22

पटवारी भू–अर्जन
रेलवे बिलासपुर हि0प्र0।

कानूनगो भू–अर्जन
रेलवे बिलासपुर हि0प्र0।

नायब तहसीलदार भू–अर्जन
रेलवे बिलासपुर हि0प्र0।

COST BENEFIT ANALYSIS (CBA)

Table – B: Estimation cost of forest diversion

SN	Parameters	Details (Rs. in Lakh)	Remarks
1	Ecosystem services losses due to proposed forest diversion	95.24	NPV (As per NPV calculation by DFO/Bilaspur office) @ Rs. 10,05,210/- per ha for proposed diversion of 6.91 ha Forest Land, and NPV @ Rs. 10,05,210/- per ha for Tunnel area, the economic value of loss of eco-system due to diversion of forest land shall be =(10,05,210x6.91) +(10,05,210x5.13x0.5) =Rs. 95,24,365/-
2	Loss of animal husbandry productivity including loss of fodder	9.52	There is no major Animal Husbandry Activities in proposed area. Hence, 10% of Net Present value (NPV) has been considered which is Rs. 9,52,436/-
3	Cost of human resettlement	0	Since the area proposed for diversion is forest on Govt. land, there is no cost due to Human resettlement.
4	Loss of public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric lines, railways etc.) on which would require forest land if these facilities were diverted due to the project.	150.00	Since the area proposed for diversion is forest on Govt. land, there is no cost due to loss of public facility. However, for alternations to the existing infrastructure facilities like village Roads, Electric lines has been estimated as Rs. 1.5 cr (lump sum) or as per actual which shall be spent as a part of the project.
5	Possession value of forest land diverted	28.57	Since the area proposed for diversion is forest on Govt. land, the possession value is kept as 30% of NPV i.e., 30% of 95,24,365/- = Rs. 28,57,309/-
6	Cost of suffering to oustees	0	Since the area proposed for diversion is forest on Govt. land, there will be

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Table – C: Existing guidelines for estimating benefits of forest – diversion in CBA

SN	Parameters	Details
1	Increase in productivity attribute to the specific project	Tangible = Rs. 120384 lakhs Non-Tangible = Mobility is difficult and time taking in mountainous regions. The new rail link from Bhanupali to Beri will thus save time, fuel and people's energy. Saving of time and fuel itself shall help indirectly in increasing the productivity of the commercial and industrial activities for which transportation shall take place along the Railway line.
2	Benefits to economy	It is a proven fact that the infrastructure like railways bring prosperity and development to a region. At present, there is no Railway Infrastructure i.e. Broad Gauge Railway Line in the interior of the State of Himachal Pradesh. The project of construction of new railway line from Bhanupali – Bilaspur – Beri has economic and strategic importance for the region as well as for the Country. In addition, such infrastructure project shall also open new avenues for academics and research as it shall bring a vast learning experience which boosts the technical knowledge for engineers in various fields of specialization. The proposed new line shall not only connect the region with railway network of the Country but also shall be of strategic importance for the Country. With the construction of Broad Gauge Line, the region shall get a push for socio-economic development as variety of job opportunity shall open up for the local residence in the region. At present, there are Cement Factories at and around Barmana in District Bilaspur, HP. The faster as well as heavy haul of the important commodity shall be possible with the construction of new railway line. The area around the project area also consists of many locations of tourist and religious importance like Naina Devi, Manali, Kullu as well as academic importance like Mandi etc. which shall be fed with the construction of new railway line. In all, the regional growth in various social, economic as well as academic fronts shall be beneficial for the state and the nation. Tangible benefits = Rs. 57487.45 lakh. Non Tangible = Improving the accessibility shall help in regional economic development.

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Summary of Cost-Benefit Analysis for the Project

SN	Cost (in Lakh)	Benefit (in Lakh)
1	Ecosystem Service Loss **Rs. 95,24,365/- = Rs. 95.24 lakh**	Total direct and indirect employment generation during construction and operation stage shall be **Rs. 82560 lakh**
2	Loss of Animal Husbandry including Fodder **Rs. 9.52 lakhs**	Economic Benefits due to Compensatory Afforestation = **Rs. 32.05 lakh** Area of compensatory land will be - 14 ha
3	Possession Value of Forest Land **Rs. 28.57 lakhs**	Benefits to Economy due to Project **Rs. 57487.45 lakh**
4	Habitat Fragmentation Cost **Rs. 47.62 lakh**	Tangible increase in productivity = **Rs. 120384 lakh**
5	Construction cost of project **Rs. 116625.63 lakh**	
6	Cost of supply of free fuel wood to workers residing in or near forest area during the period of construction. Construction period - 5 years Number of labours at peak time - 800 Per head cost of fuel – Rs.20.00 per day Total cost = **Rs.292.00 lakh**	
	Total = Rs. 117098.58 lakh	**Total = Rs. 260463.50 lakh**

Cost Benefit Ratio = $\frac{Benefit}{Loss} = \frac{260463.50}{117098.58}$ = **2.22**

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5. MUCK DISPOSAL PLAN

This chapter aims to develop muck disposal plan for the rail route between Bhanupali- Bilaspur -Beri. A large quantity of material would be excavated from the tunnel and from cutting locations along the alignment. Muck generated from this excavation is required to be disposed of in a planned manner so that it takes the least possible space and is not hazardous to the environment. An account of the same has been provided in the following paragraphs.

5.1. Muck Estimation and Dumping sites

The total quantity of muck generated from tunnel and cutting location of the alignment from Km 50.200 to Km 62.900 is estimated to be 5,80,951 cum. All the muck generated is to be utilised in filling along the alignment. The quantity of muck left after filling along the alignment will be NIL. Ref: Table 27.

The details of muck volumes received from the tunnel, cut locations and fill requirements along the alignment are provided in Table 24,Table 25 and Table 26.

Table 24: Quantity of muck estimated from Tunnel

Sl.No.	TUNNEL	START (m)	END (m)	Length (m)	Quantity of muck estimated (cum)
1	Tunnel - T17	51887.959	52931.244	1043.285	62597.100
2	Tunnel - T18	53041.669	53660.186	618.517	37111.020
3	Tunnel - T19	54679.313	57382.127	2702.814	162168.840
4	Tunnel - T20	57609.736	59755.587	2145.851	128751.060
Average Cross-section Area of main tunnel = 60 m2				TOTAL	390628.020
Average Cross-section Area of evacuation tunnel = 30 m3					NIL

Table 25: Cut and fill quantity estimated (kilometre wise)

Sl. No	Station		Cut Area	Cut	Fill Area (Sqm.)	Fill Volume (cum)
	From	To	(sqm)	Volume (Cum)		
1	50200.00	50250.00	0.00	0	0	0
2	50250.00	50300.00	0.01	0	429	21761
3	50300.00	50350.00	0.00	0	336	19119
4	50350.00	50400.00	0.00	0	297	15830

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Sl. No	Station		Cut Area	Cut	Fill Area (Sqm.)	Fill Volume (cum)
	From	To	(sqm)	Volume (Cum)		
5	50400.00	50450.00	0.00	0	316	15329
6	50450.00	50500.00	0.00	0	271	14671
7	50500.00	50550.00	0.00	0	679	23745
8	50550.00	50600.00	0.00	0	248	23158
9	50600.00	50650.00	0.00	0	163	10274
10	50650.00	50700.00	0.00	0	135	7456
11	50700.00	50750.00	0.00	0	101	5907
12	50750.00	50800.00	0.00	0	48	3735
13	50800.00	50850.00	0.00	0	70	2946
14	50850.00	50900.00	0.00	0	39	2720
15	50900.00	50950.00	0.00	0	100	3462
16	50950.00	51000.00	0.02	1	30	3240
17	51000.00	51050.00	0.00	1	0	751
18	51050.00	51100.00	0.00	0	0	0
19	51100.00	51150.00	14.88	372	0	0
20	51150.00	51200.00	24.43	983	0	0
21	51200.00	51250.00	23.29	1193	0	0
22	51250.00	51300.00	10.54	846	2	61
23	51300.00	51350.00	17.50	701	2	102
24	51350.00	51400.00	25.32	1071	0	41
25	51400.00	51450.00	88.44	2844	0	0
26	51450.00	51500.00	439.02	13187	0	0
27	51500.00	51550.00	728.30	29183	5	115
28	51550.00	51600.00	43.03	19283	0	115

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Sl. No	Station		Cut Area	Cut	Fill Area (Sqm.)	Fill Volume (cum)
	From	To	(sqm)	Volume (Cum)		
29	51600.00	51650.00	115.99	3976	0	0
30	51650.00	51700.00	295.65	10291	0	0
31	51700.00	51750.00	221.70	12934	370	9254
32	51750.00	51747.13	0.00	5543	805	29368
33	51747.13	51845.37	BRIDGE 59B			
34	51845.37	51887.96	0.00	0	317	28045
35	51887.96	52931.24	TUNNEL T17			
36	52950.00	53000.00	196.69	45419	0	1
37	53041.67	53660.19	TUNNEL T18			
38	53700.00	53750.00	108.18	15551	0	5
39	53750.00	53800.00	5.61	2845	0	1
40	53800.00	53850.00	31.11	918	0	1
41	53850.00	53900.00	41.02	1803	0	0
42	53900.00	53950.00	41.46	2062	0	0
43	53950.00	54000.00	34.16	1891	0	0
44	54000.00	54050.00	4.90	977	3	74
45	54050.00	54100.00	37.47	1059	0	74
46	54100.00	54150.00	37.38	1871	0	1
47	54150.00	54200.00	24.90	1557	0	0
48	54200.00	54250.00	38.09	1575	0	0
49	54250.00	54300.00	67.66	2644	0	0
50	54300.00	54350.00	160.29	5699	0	0
51	54350.00	54400.00	282.55	11071	0	0

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Sl. No	Station		Cut Area	Cut	Fill Area (Sqm.)	Fill Volume (cum)
	From	To	(sqm)	Volume (Cum)		
52	54400.00	54450.00	297.82	14509	0	0
53	54450.00	54500.00	284.07	14547	0	0
54	54548.03	54629.31	BRIDGE 63			0
55	54679.31	57382.13	TUNNEL T19			0
56	57400.00	57450.00	181.77	27108	0	3
57	57450.00	57500.00	0.00	4544	71	1778
58	57500.00	57550.00	0.00	0	258	8232
59	57550.00	57600.00	0.00	0	36	7365
60	57609.74	59755.59	TUNNEL T20			0
61	59800.00	59850.00	595.06	24104	0	29
62	59850.00	59900.00	154.11	18729	2	39
63	59900.00	59950.00	145.17	7482	0	39
64	59953.64	60034.82	BRIDGE 65			0
65	60050.00	60100.00	0.00	21	783	19577
66	60100.00	60150.00	0.00	0	725	37706
67	60150.00	60200.00	0.00	0	1242	49165
68	60200.00	60250.00	0.00	0	1237	61960
69	60250.00	60300.00	0.00	0	953	54740
70	60300.00	60350.00	0.00	0	827	44485
71	60350.00	60400.00	0.00	17	1063	47232
72	60400.00	60450.00	0.00	17	1604	66652
73	60450.00	60500.00	0.00	0	787	59772
74	60500.00	60550.00	0.00	0	260	26179

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	From	To	(sqm)	Volume (Cum)		
75	60550.00	60600.00	0.00	0	400	16481
76	60600.00	60650.00	0.00	0	61	11513
77	60650.00	60700.00	0.00	0	58	2979
78	60700.00	60750.00	0.00	0	58	2891
79	60750.00	60800.00	0.00	0	61	2961
80	60800.00	60850.00	0.00	0	57	2958
81	60850.00	60900.00	0.00	0	53	2755
82	60900.00	60950.00	0.00	0	32	2115
83	60950.00	61000.00	0.00	0	40	1790
84	61000.00	61050.00	0.00	0	35	1869
85	61050.00	61100.00	0.00	0	32	1678
86	61100.00	61150.00	0.00	0	32	1595
87	61150.00	61200.00	0.00	0	26	1441
88	61200.00	61250.00	0.00	0	25	1263
89	61250.00	61300.00	0.00	0	22	1162
90	61300.00	61350.00	0.00	0	15	914
91	61350.00	61400.00	0.00	0	6	519
92	61400.00	61450.00	0.00	0	2	191
93	61450.00	61500.00	2.66	67	0	37
94	61500.00	61550.00	5.45	203	0	0
95	61550.00	61600.00	9.91	384	0	0
96	61600.00	61650.00	15.00	623	0	0
97	61650.00	61700.00	7.34	559	0	1
98	61700.00	61750.00	11.36	468	0	1

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Sl. No	Station		Cut Area	Cut	Fill Area (Sqm.)	Fill Volume (cum)
	From	To	(sqm)	Volume (Cum)		
99	61750.00	61800.00	4.71	402	0	0
100	61800.00	61850.00	11.46	404	0	0
101	61850.00	61900.00	4.60	402	0	0
102	61900.00	61950.00	10.11	368	0	0
103	61950.00	62000.00	14.17	607	0	0
104	62000.00	62050.00	11.48	641	0	0
105	62050.00	62100.00	9.81	532	0	0
106	62100.00	62150.00	10.09	498	0	0
107	62150.00	62200.00	8.66	469	0	0
108	62200.00	62250.00	3.91	314	0	0
109	62250.00	62300.00	2.46	159	0	0
110	62300.00	62350.00	3.88	159	0	0
111	62350.00	62400.00	8.97	321	0	0
112	62400.00	62450.00	11.26	506	0	0
113	62450.00	62900.00	15.57	671	0	0
	TOTAL			319186		783429

Table 26: Quantity of muck generated and utilised

Sl. No.	Chainage (km)		Muck generated from cutting (cum)	Muck utilised in filling (cum)	Balance Muck (cum)
	Start	End			
1	50200	51850	102409	241205	-138796
2	52950	53000	45419	1	45418
3	53700	54500	80579	156	80423
4	57400	57600	31652	17378	14274
5	59800	59950	50315	107	50208
6	60050	62600	8812	524582	-515770
	TOTAL		319186	783429	-464243

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5. APPROACH ROAD

5.1. Introduction

Proper planning prior to the commencement of the actual construction activity is crucial for the success of the project. Before starting any such project, particularly in hilly terrain, first and the foremost work that needs to be completed is the approach to the construction sites. Based on the tunnel portals, bridges and stations proposed along the alignment, approach road requirements to facilitate the construction of these structures have been assessed. Planning and analysis of all required approach roads have been presented in this chapter.

6.1.1. Purpose

The purpose of this chapter is to identify the requirement of the approach road based on the available road network in the project area, locations of the proposed project structures, length of the approach road, design of approach road to access all the identified tunnel portals, bridges sites and stations.

5.2. Design Criteria

The approach roads have been designed following the hill road manual (IRC: SP: 48-1998). The roadway width has been taken as 5 m that shall be enough for movement of construction machinery. Roads are proposed in such a way that cut & fill along the alignment is kept as minimum as possible. For the construction of these roads, a 12 m strip of land has been proposed to acquire along the route. The design criteria used for the design of the approach road is provided in Table 30.

Table 30: Design parameter proposed for Approach Road.

Sl.No.	HEADS	DESCRIPTION
1	**Design Speed**	20 Km/ Hr
2	**Roadway Width**	5m
3	**Gradient**	
	Ruling Gradient	5% (1:20)
	Limiting Gradient	6% (1:16.7)
	Exceptional	7% (1: 14.3)
4	**Curve Details**	
4a	**Horizontal Curve**	
	Ruling Radius	20 m
	Absolute Radius	14m
5	**Hair- Pin Bends**	
	Minimum Roadway at Apex	6.5m
	Minimum Radius for the inner curve	14m
	Maximum gradient	2.5% (1:40)

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6.3.1. Approach Road Requirement from Km 52.015 to Km 62.900

The railway alignment from Km 52.015 to Km 62.900 is proposed in difficult hilly terrain. The road network present in this part of the alignment is not enough to reach the important construction sites like tunnel portals, and bridges. To access all these sites, construction of approach road shall be a necessity. The approach road to these working sites has been planned considering the topography, geology and geomorphology of the area. The details of the required approach roads are provided in Table 32.

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Table 27: Balance Muck to be dumped

Sl.No.	Description	Quantity of Muck (cum)
1	Muck generated from the tunnel	390628
2	Muck generated from cutting	319186
3	Total muck estimated	709814
4	Muck utilised in filling	783429
5	Difference	-73615
6	Balance muck to be dumped	NIL

The proposed scheme of muck dumping is described in Table 29. In this table, chainage wise muck generated, and corresponding filling along the alignment is presented.

Table 29: Details of Chainage wise muck generated and its dumping sites

Sl.No.	Type of excavation	Chainage (m)		Muck generated (cum)		Total Muck generated including factor @30%	Muck dumping facility			
		Start	End				Code	Location	Lead (km) from structure	Capacity (cum)
1	Bilaspur Station	50200.0	51850.0	-138796	-73615	-95700	-	-	0.2-12	-
	T-17	51887.9	52931.2	62597						
	Cut/Fill	52950	53000	45418						
	T-18	53041.6	53660.1	37111						
	Cut/Fill	53700	54500	80423						
	T-19	54679.3	57382.1	162169						
	Cut/Fill	57400	57600	14274						
	T-20	57609.7	59755.5	128751						
	Cut/Fill	59800	59950	50208						
	Cut/Fill	60050	62600	-515770						

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Table 32: Proposed Approach roads from Km 52.015 to Km 62.900

Sl. No	Reference of the Approach road	Proposed Length (m)	Reference of proposed structure to be linked / served
1	Approach Road - 15	132	Planned to connect access for the portals of T17P2 & T18P1.
2	Approach Road - 16	206	This approach road is required to connect abutment A1 of Bridge Br62.
3	Approach Road - 17	446	This approach road is planned to connect Tunnel portal T19 P1 and Abutment A2 of Bridge Br62.
	Total Length (m)	784	

Approach Road-15

Approach road -15 is planned to reach the tunnel portals T17P2 and T18P1. Ref: Figure 170. This road takes-off from the existing village road near Nog village. The proposed road is 132m long and passes through the moderately steep hill slope. The hillslope area is composed of sandstone and Siltstone of Dagshai formation and covered with slope wash material. The maximum cut proposed along this road 3m.

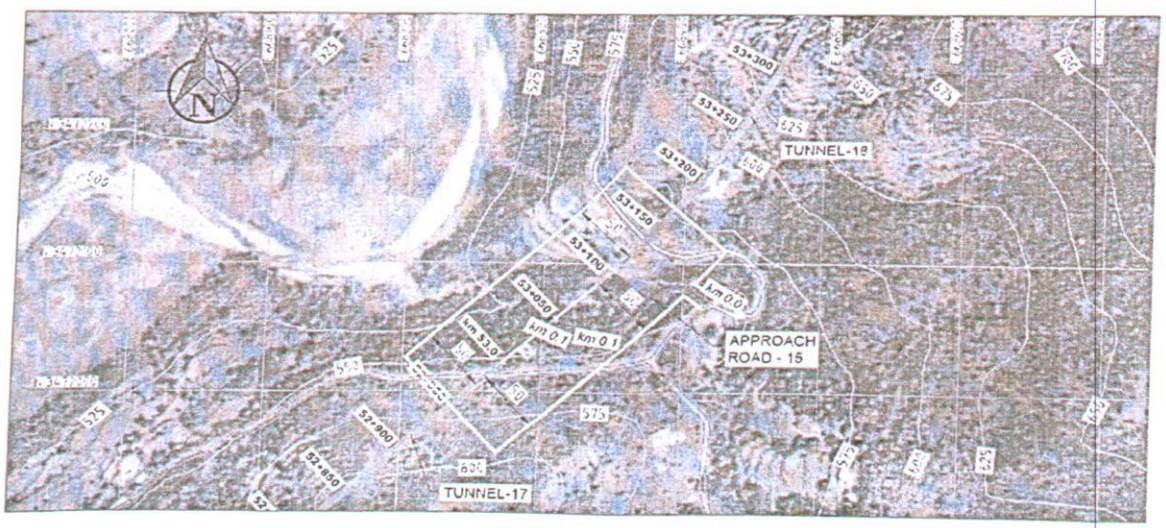

Figure 170: Plan indicating Approach Road- 15 (Ref: Annexure-6)

Approach Road-16 and 17

Approach roads 16 and 17 are planned to reach the tunnel portal T19P1 and Bridge Br23. Ref: Figure 171. The approach road-17 takes-off from existing NH near Dali village and is 446m long. The approach road-16 of length 214m is proposed to access the left bank of Ali Khad. The area generally composed of sandstone and siltstone of Dagshai formation and is covered with slope wash material. The maximum cut proposed along this road is 3m.

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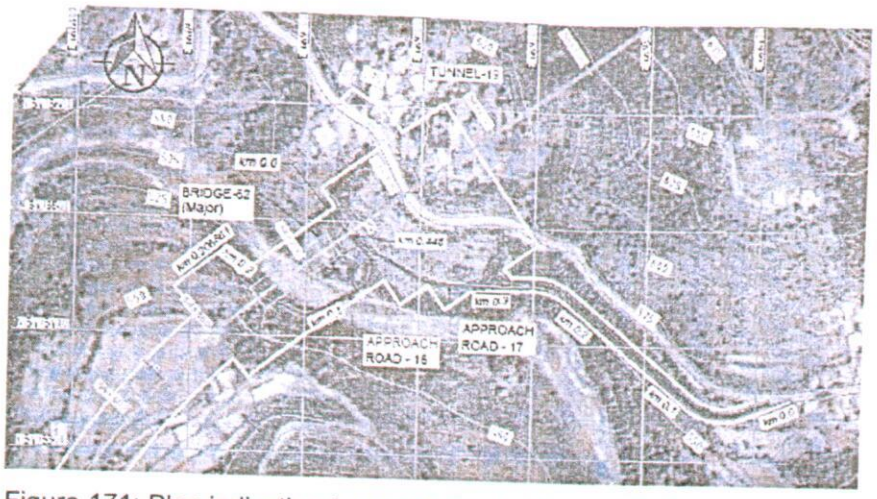

Figure 171: Plan indicating Approach Road- 16 and 17 (Ref: Annexure-6)

All these approach roads are to be utilised for construction, during the operation & maintenance and emergency.

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