

Preparation of the Geo-referenced map through
DGPS survey of Forest land in Janjgir Champa Forest
Division over an area of 6.282 Ha. For 765kV D/C
Jharsuguda (Sundargarh)-Raipur Transmission Line of
Odisha Generation Phase-II Transmission Limited
(OGPTL) Chhattisgarh



Consultant
SPARC Pvt. Ltd., Bhubaneswar



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August, 2016

Prepared for:



**Odisha Generation Phase-II Transmission
Limited,**

Project office: House No :B-1/03,Phase-II
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Prepared by:

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1. INTRODUCTION AND BACKGROUND INFORMATION

The Government of India, Central Electricity Authority vide Gazette Notification dated February 06, 2015 has notified PFC Consulting Limited to be the Bid Process Coordinator (BPC) for the purpose of selection of Bidder as Transmission Service Provider (TSP) to establish transmission system for "Common Transmission System for Phase-II Generation Projects in Odisha and Immediate Evacuation System for OPGC (1320 MW) Project in Odisha" through tariff based competitive bidding process

Sterlite Grid 3 Limited had been participated in the international competitive bidding process for Transmission Scheme for "Common Transmission System for Phase-II Generation Projects in Odisha and Immediate Evacuation System for OPGC (1320 MW) Project in Odisha ".

Power Finance Corporation Consulting Limited (PFCCCL), Government of India has accepted our Bid and SGL 3 has been declared as the successful bidder.

Special Purpose Vehicle (SPV) constructed for this project is "Odisha Generation Phase II Transmission Ltd". SPV acquisition process is under progress.

Prior approval under Section 68(1) of Electricity Act, 2003 from Ministry of Power, Government of India has been already taken for construction of transmission element by "Odisha Generation Phase II Transmission Ltd" (Associated Transmission Lines are 765kV D/C Raipur-Jharsuguda & 400kV D/C OPGC-Jharsuguda) vide letter no. 68/ER/2015/1301 dated 3rd June 2015.

The details of lines is mentioned here under: -

1. 765kV D/C Raipur-Jharsuguda Transmission Line: 300 K.M (Approx.)

Above said line passes through Durg, Bematara, Baloda Bazar, Bilaspur, Janjgir Champa & Raigarh districts of Chattisgarh State (Total Line length is 255 K.M Approx) and Jharsuguda district of Odisha State (Total Line length is 45 K.M Approx).

As per directives of Ministry of Environment & Forests dated 8th July 2011; all applications seeking diversion of forest land for non-forest purpose under Forest Conservation Act, 1980 must be accompanied with Geo-referenced shapefile (both soft copy and hard copy) of the forest land proposed for diversion prepared using Differential GPS (DGPS)

As per Online Submission and Monitoring of Forests Clearances Proposals of MoEF & CC, the following maps and files are required to be uploaded

- Survey of India Topo sheet in 1:50,000 scale indicating location of the forest land proposed to be diverted
- Scanned copy of the geo-referenced map of the forest land proposed to be diverted by using DGPS or Total Station
- KML file of the geo-reference forest land proposed to be diverted

In order to comply with the conditions of DGPS survey guideline for PCCF given to OGPTL is enclosed at Annexure-1. To meet these requirements, OGPTL is entrusted this DGPS survey work to M/s SPARC Pvt. Ltd., Bhubaneswar, a Government recognized reputed firm specializing in such assignments. Credential of SPARC is enclosed at Appendix-1

2. SCOPE

The envisaged scopes of the assignments are described below

- Computation of Geo-referenced forest land through digitization and comparison with area indicated in the land schedule.
 - Establishment of Base Station by taking DGPS long Observation and fixing the coordinate by processing with IGS (International GNSS Services) data.
 - DGPS observation at the change point of the forest land
- Processing of DGPS observation and geo-referencing of the Forest land based on DGPS Surveyed co-ordinates.
- Generation of the *shape* file and *kml* file of the Forest land
- Printing of Hard copy maps and report.

3. DELIVERABLE

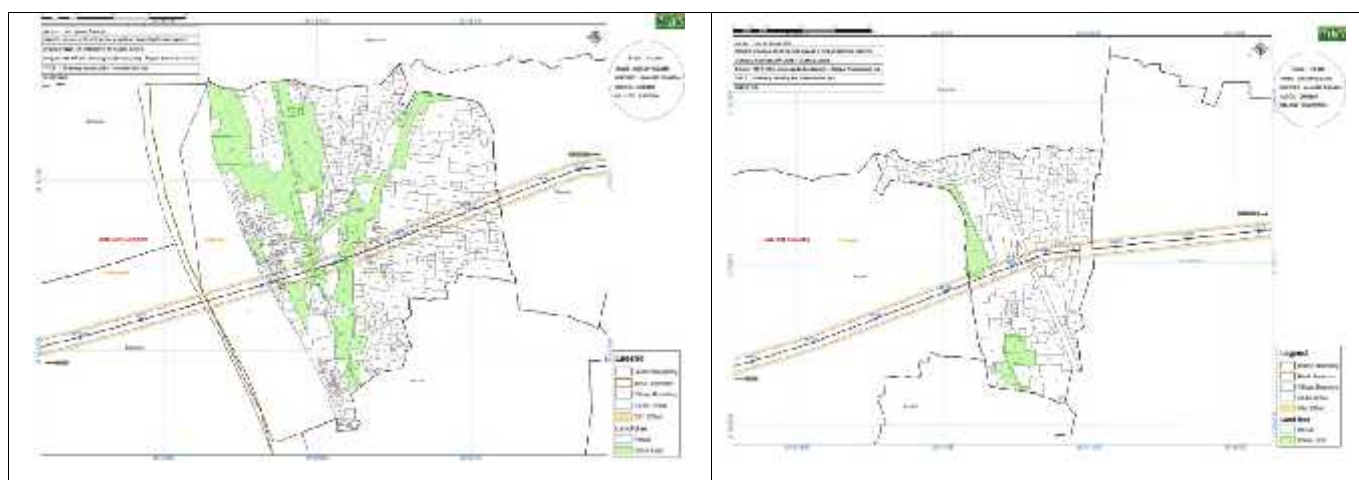
- Post processed DGPS observations data as well as raw data in RINEX format.
- Geo-referenced scanned cadastral/forest compartment maps based on field observation.
- Geo-referenced shape, kml file (soft copy) of the Forest land with area statement.
- Submission of maps & report in 10 nos. hard copy along with soft copy and shape/kml file as per requirement of MoEF guidelines.

4. METHODOLOGY

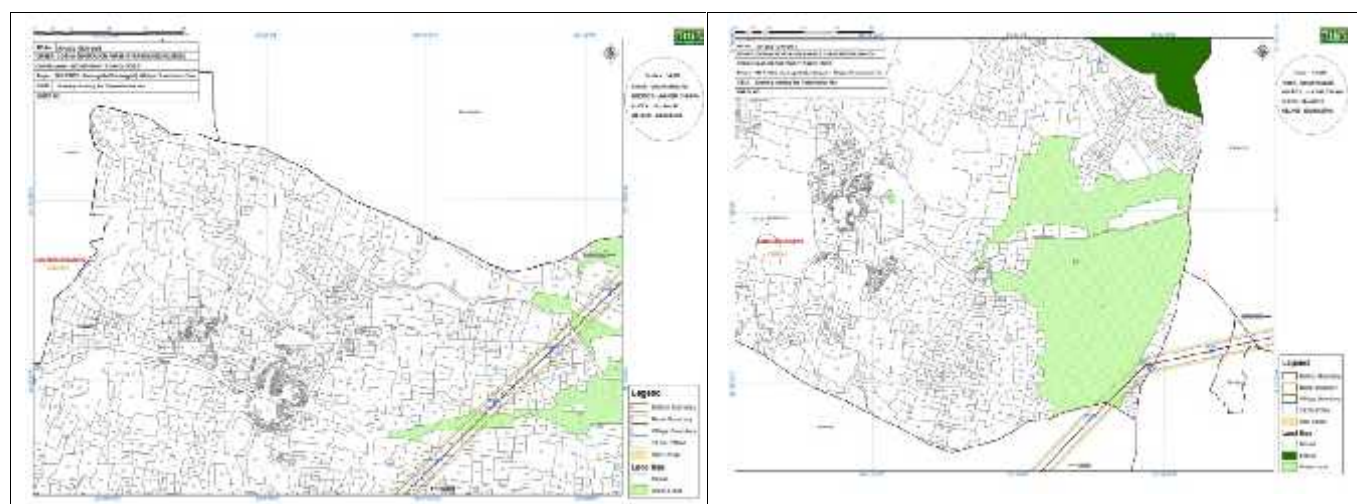
4.1 INPUT DATA

The land plan and maps required for geo-referencing was provided by OGPTL to M/s SPARC along with the land schedules for desk study. The following maps are used for the desk study.

- Revenue maps of the Forest land Map
- Survey of India Topo Sheets
- Land Schedule



*Fig-1: Transmission Line Superimposed on Cadastral Map
Tahsil-Champa (Village-Bargadi,Champa)*



*Fig-2: Transmission Line Superimposed on Cadastral Map
Tahsil-Jaijaipur (Village-Akalsara,Khamria)*

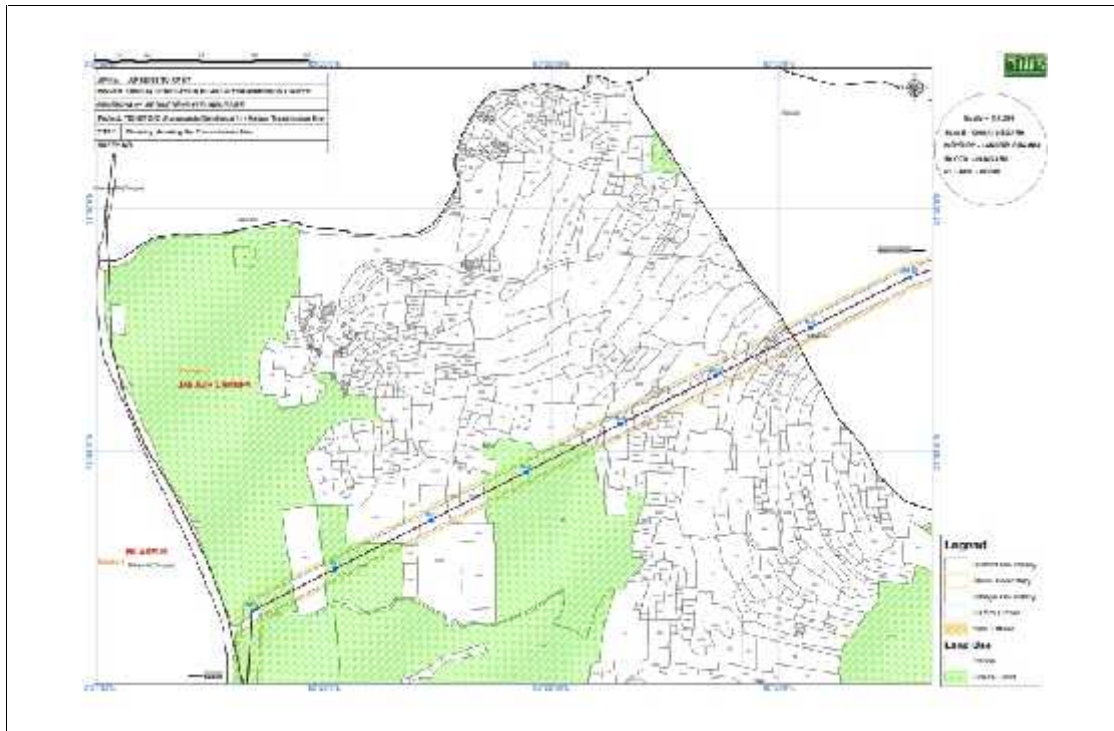
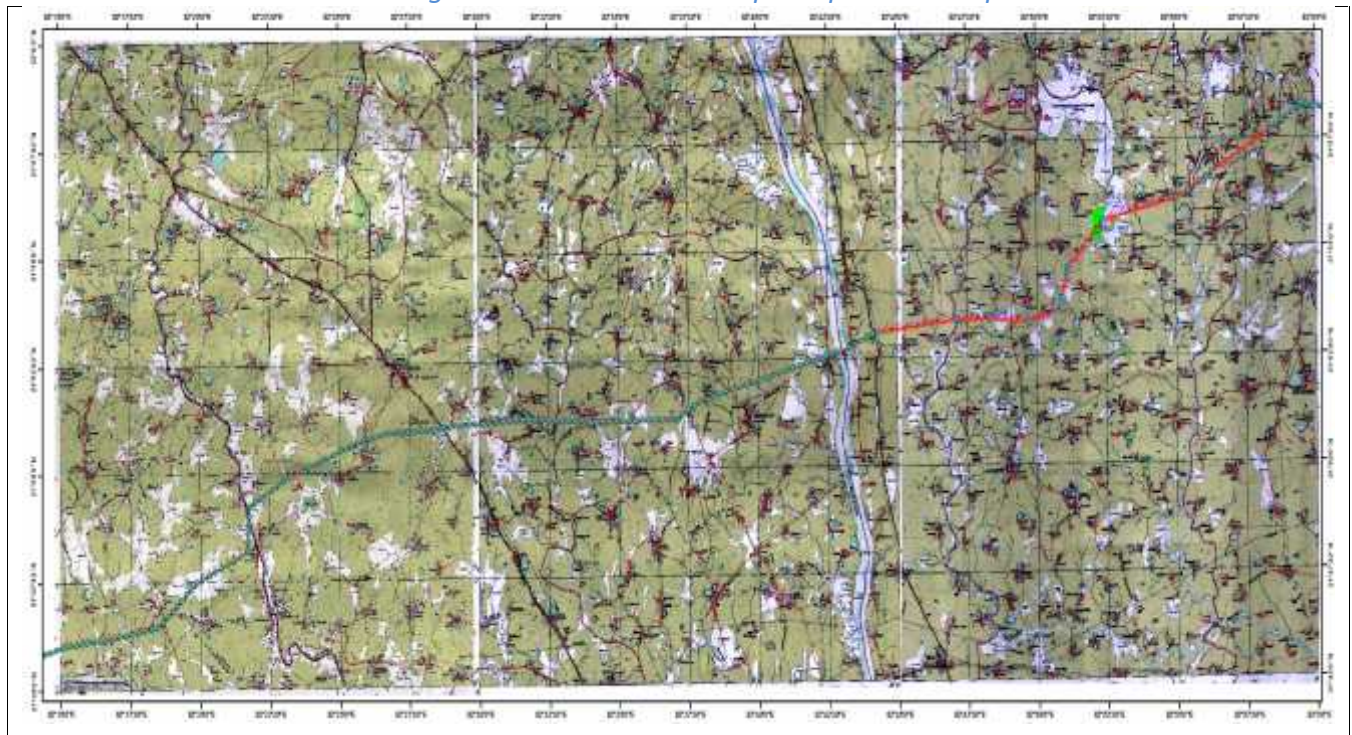


Fig-3: Transmission Line Superimposed on Cadastral Map
Tahsil-Pamgarh (Village-Koshir)

Fig-4: Transmission Line Superimposed on Topo Sheet



4.2 PRINCIPLE OF DGPS SURVEY

DGPS Survey is carried out by a pair of devices, one is called base and other is called as rover in order to eliminate the un-avoidable error which may occur during survey as transmission delays in the ionosphere, multipath signal due to foreign object which may induce in the DGPS observation.

Base is stationary and fixed in an ideal location (that has a clear line of sight to the sky in all directions away from vertical obstructions such as buildings, deep cuttings, site vehicles, towers, or tree canopy) which is act as the Primary Control Point (PCP) while the rover collects the reading at target locations.

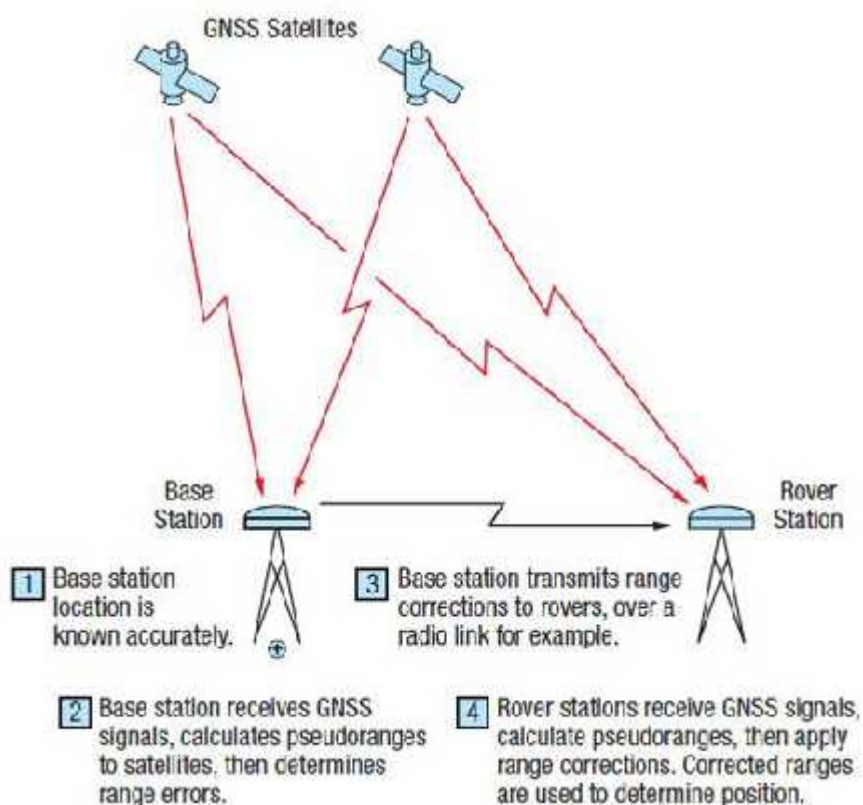


Fig-3: Concept of the DGPS survey

As the rover has no choice of sites and has to take reading at the pre fixed target location, it may induce error as discussed earlier. Therefore, the data received by the rover has to be processed with the observation received by the base rover in real time mode (through radio link) or during post process in a later stage to eliminate the error and get the final reading (coordinate value).

4.3 ESTABLISHMENT OF BASE STATION/PRIMARY CONTROL POINT (PCP)

The PCP was so planned to keep the entire project area within 3.0-4.0 Km from PCP for DGPS Survey.

GPS satellites complete one cycle of rotation around the earth in approximately 6 hours. Base Station was fixed through continuous observation of 12 hours (so that the base receives signals of all the satellite at least once) at the PCP on 24th July 2016 and further processing with the observed data of International GNSS Stations (IGS). The IGS processed report is enclosed at Annexure-2. The processed coordinate value is as follows.

Table-2: Coordinate of Base Station

Location	PCP	Latitude	Longitude	Northing (m)	Easting (m)
Champa	PCP-03	N21°53'19.54506"	E82°49'02.04344"	687745.277	2421624.834
Janjgir	PCP-04	N21°49'30.31116"	E82°21'45.39957"	640831.356	2414089.349

As per the National Map policy is enclosed at Annexure-3, all the maps are prepared with UTM Projection using the Datum WGS-1984 to seamless integration with new Open Series Maps (OSM) Topo Sheets published by Survey of India.

4.4 SECONDARY CONTROL POINT (SCP) SURVEY

4-6 secondary point per revenue sheet are required to geo-reference the maps based on DGPS survey. The Secondary Control Points (SCPs) in the area of interest were planned at convenient location. SCPs are planned well distributing in the revenue maps covering Tri-junction, Bi-junction, undistributed field bund.



DGPS observations were taken SCPs location (for 15 minutes each) using rover. The data observed by base and rover were post processed using advanced Trimble Business Centre software for obtaining the final SCP Co-ordinates. The SCPs with fixed solutions only were used for Geo-referencing of the revenue maps.

4.5 PREPARATION OF GEO-REFERENCING OF REVENUE FOREST LAND

With geo-referencing of cadastral maps, each and every parcel of the revenue map also automatically geo-referenced. The forest patches were extracted from geo-referenced cadastral map as per land schedule provided by OGPTL to prepare the geo-referenced forest land map.

DGPS observations were taken at all change point of the Forest boundary using Trimble R-6 Dual frequency (with Glonass) DGPS. The data observed by base and rover were post processed using advanced Trimble Business Centre software for obtaining the final change point Co-ordinates. These co-ordinates were plotted in GIS software to prepare the geo-reference forest land map. 41 nos of change points are taken on both side of the forest boundary.

5. CONCLUSION

The observed DGPS co-ordinates of SCPs of Cadastral Map, forest boundary pillars and area are given in *Table-3 and Table-5* respectively.

Table-3: Coordinates of Secondary Control Points (SCPs)

Point-ID	Latitude	Longitude	Height	Easting	Northing	Elevation
1	N21°53'20.70126"	E82°44'22.52973"	177.33	679721.49	2421567.521	239.466
2	N21°52'50.60293"	E82°43'47.06010"	173.87	678713.78	2420630.325	236.034
3	N21°52'59.79791"	E82°44'21.48738"	176.08	679698.84	2420924.279	238.23
4	N21°56'09.48607"	E82°52'28.17581"	173.77	693598.59	2426922.927	235.689
5	N21°54'54.33305"	E82°50'30.32470"	186.67	690244.46	2424570.432	248.669
6	N21°54'52.64887"	E82°51'40.69032"	176.02	692264.61	2424542.997	238.002
8	N21°56'19.53746"	E82°51'03.56855"	183	691166.94	2427202.585	244.917
9	N21°49'45.15654"	E82°21'45.95368"	175.65	640843.23	2414546.012	238.107
10	N21°49'30.76462"	E82°22'06.72109"	177.29	641443.45	2414108.719	239.76
11	N21°49'18.01232"	E82°22'03.13159"	172.8	641343.86	2413715.648	235.278
12	N21°50'08.89178"	E82°22'24.38727"	173.98	641940.25	2415285.715	236.412

13	N21°49'13.85860"	E82°22'51.44686"	182.63	642732.34	2413600.284	245.109
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Table-4: Coordinates of Change point of Forest Land

Pillar No	UTM Co-ordinates		Geographic Co-ordinates	
	Easting	Northing	Longitude	Latitude
Patch-1				
1	640863.710	2413541.142	82°21'46.35742"	21°49'12.47640"
2	640826.899	2413548.503	82°21'45.77825"	21°49'12.72637"
3	640815.445	2413559.194	82°21'44.68225"	21°49'13.77268"
4	640780.255	2413573.492	82°21'43.46121"	21°49'13.55229"
5	641077.683	2413726.854	82°21'53.86588"	21°49'18.45342"
6	641226.730	2413803.706	82°21'59.79932"	21°49'20.90939"
7	641368.279	2413801.310	82°22'4.8412"	21°49'20.79064"
8	641081.744	2413653.565	82°21'53.98468"	21°49'16.69212"
Patch-2				
9	641437.017	2413800.501	82°22'6.40188"	21°49'20.74451"
10	641432.946	2413726.641	82°22'6.23728"	21°49'18.34406"
11	641377.697	2413726.059	82°22'4.31312"	21°49'18.34110"
12	641378.860	2413801.664	82°22'4.377"	21°49'20.79912"
Patch-3				
13	641438.584	2413837.561	82°22'6.46789"	21°49'21.94908"
14	641440.937	2413913.974	82°22'6.57345"	21°49'24.43305"
15	641544.702	2413966.650	82°22'10.20326"	21°49'26.11588"
16	641544.911	2413960.384	82°22'10.20859"	21°49'25.91208"
17	641547.774	2413955.803	82°22'10.30689"	21°49'25.76227"
18	641547.774	2413934.040	82°22'10.30016"	21°49'25.54645"
19	641554.074	2413929.459	82°22'10.51812"	21°49'24.90385"
20	641552.929	2413914.568	82°22'10.47362"	21°49'24.42001"
21	641557.510	2413912.277	82°22'10.63246"	21°49'24.34419"
22	641557.837	2413898.329	82°22'10.63953"	21°49'23.89056"
Patch-4				
23	677879.863	2420416.562	82°43'17.93009"	21°52'43.95786"
24	677878.504	2420425.910	82°43'17.88638"	21°52'44.26226"
25	677903.272	2420423.938	82°43'18.74831"	21°52'44.18911"
Patch-5				
26	678024.375	2420508.035	82°43'22.99933"	21°52'46.87900"
27	678010.813	2420509.004	82°43'22.52732"	21°52'46.91544"
28	678005.485	2420494.473	82°43'22.33607"	21°52'46.44499"
29	678005.485	2420461.053	82°43'22.32302"	21°52'45.35849"
30	677983.689	2420462.021	82°43'21.56422"	21°52'45.39793"
31	677968.839	2420514.843	82°43'21.67599"	21°52'47.12056"
32	678020.657	2420531.169	82°43'22.87886"	21°52'47.63244"
Patch-6				
33	678035.999	2420515.300	82°43'23.40706"	21°52'47.11096"

Pillar No	UTM Co-ordinates		Geographic Co-ordinates	
	Easting	Northing	Longitude	Latitude
34	678027.765	2420516.269	82°43'23.12063"	21°52'47.14546"
35	678026.657	2420533.059	82°43'23.88596"	21°52'47.69172"
36	678037.821	2420536.577	82°43'23.47883"	21°52'47.802"
Patch-7				
37	678040.217	2420467.085	82°43'23.53513"	21°52'45.54193"
38	678034.364	2420489.327	82°43'23.33997"	21°52'46.26716"
39	678059.066	2420491.870	82°43'24.20137"	21°52'46.34082"
40	678076.503	2420488.237	82°43'24.80730"	21°52'46.21637"
41	678087.467	2420481.972	82°43'25.18675"	21°52'46.8691"
Patch-8				
42	679065.730	2420920.750	82°43'59.43332"	21°52'59.91571"
43	679064.427	2420927.740	82°43'59.39068"	21°53'0.14344"
44	679193.931	2420975.617	82°44'3.92043"	21°53'1.65243"
45	679194.624	2420973.262	82°44'3.94364"	21°53'1.57561"
46	679148.477	2420955.758	82°44'2.32934"	21°53'1.23479"
47	679148.477	2420947.006	82°44'2.32590"	21°53'0.73895"
48	679082.439	2420923.932	82°44'0.16571"	21°53'0.13047"
Patch-9				
49	692657.225	2425135.623	82°51'54.61910"	21°55'11.75867"
50	692664.553	2425140.697	82°51'54.87657"	21°55'11.9207"
51	692667.935	2425160.427	82°51'55.276"	21°55'12.56074"
52	692676.955	2425162.118	82°51'55.31770"	21°55'12.61215"
53	692688.750	2425151.897	82°51'55.72428"	21°55'12.27523"
54	692604.465	2425075.366	82°51'52.75553"	21°55'9.82071"
55	692565.338	2425108.564	82°51'51.40643"	21°55'10.91536"
56	692550.358	2425116.735	82°51'50.88802"	21°55'11.18689"
57	692606.025	2425167.281	82°51'52.84878"	21°55'12.80803"
58	692619.455	2425155.917	82°51'53.31186"	21°55'12.43330"
Patch-10				
59	693300.260	2425772.698	82°52'17.29226"	21°55'32.21372"
60	693265.122	2425778.005	82°52'16.70305"	21°55'32.40016"
61	693258.102	2425744.659	82°52'15.81155"	21°55'31.31897"
62	693275.652	2425742.027	82°52'16.42188"	21°55'31.22644"
63	693260.477	2425691.702	82°52'15.87181"	21°55'29.59653"
64	693195.985	2425633.533	82°52'13.60021"	21°55'27.73118"
65	693162.068	2425653.946	82°52'12.42724"	21°55'28.4082"
66	693105.913	2425642.519	82°52'10.46597"	21°55'28.58977"
67	693355.394	2425867.541	82°52'19.25345"	21°55'35.27492"
68	693339.711	2425826.268	82°52'18.68949"	21°55'33.9395"

Table-5: Area Statement of Forest Boundary

जिला	तहसील	(ग्राम)	(खसरा नं)	डी.जी.पी.एस सर्वेक्षण पश्चात रकबा		(मद)
				कुल रकबा(हे0)	प्रभावित रकबा (हे0)	
जांजगीर चोंपा	चोंपा	बरगडी	137	1.821	0.009	छोटे झाड का जंगल
			131/1	1.214	0.181	छोटे झाड का जंगल
			267	0.518	0.323	छोटे झाड का जंगल
			269/1	0.825	0.021	छोटे झाड का जंगल
		चारपारा	44	3.497	0.148	वन
	Total Area (I)			7.875	0.682	
	जैजैपुर	खहिया	933/1	69.471	1.215	बडे झाड का जंगल
		अकलसरा	824	32.971	0.589	वन
	Total Area (II)			102.388	1.804	
	पामगढ़	कोसीर	105/1	2.428	0.890	छोटे झाड का जंगल
			105/3	1.293	1.293	छोटे झाड का जंगल
			106/1	0.405	0.405	छोटे झाड का जंगल
			113/13	0.121	0.121	छ.ग. शासन
			7/1	47.571	1.087	छोटे झाड का जंगल
	Total Area (III)			51.818	3.796	
		Total Area (कुल रकबा)		162.081	6.282	

The forest boundary map is placed at Plate-1 to Plate-3. The Geo-referenced forest boundary superimposed on Sol Topo sheet & High Resolution Satellites Image are enclosed at Plate-5 to Plate-6 respectively.

6. SPECIFICATION OF DGPS EQUIPMENT & SOFTWARE

SPARC deployed advanced and hi-precision devices to carry out the DGPS survey. The DGPS performance specifications are given below. The corresponding fact sheets are placed at Annexure-4 for ready reference.



Map Showing DGPS Surveyed Co-ordinates and Boundary of Forest Area Proposed to be Diverted for 765KV D/C Jharsuguda (Sundargarh-Raipur) Transmission Line OF Odisha Generation Phase-II Transmission Limited (OGPTL) in Village-Kosir, Tahasil-Pamgarh,Janjgir Champa Forest Division, District-Janjgir Champa,Chhatisgarh

Scale:- 1:4,000

● Observation Point

● AP Point

Forest Plot

Patch Boundary

● Forest Pillar

Centre Line

Alignment Boundary

CO-ORDINATES OF SCP/DGPS OBSERVATION POINT				
Point-ID	Geographic Co-ordinates		UTM Co-ordinates	
	Latitude	Longitude	Easting	Northing
9	N21°49'45.15654"	E82°21'45.95368"	640843.229	2414546.012
10	N21°49'30.76462"	E82°22'06.72109"	641443.446	2414108.719
12	N21°50'08.89178"	E82°22'24.38727"	641940.250	2415285.715
13	N21°49'13.85860"	E82°22'51.44686"	642732.338	2413600.284

CO-ORDINATES OF FOREST PILLAR				
Pillar No	Geographic Co-ordinates		UTM Co-ordinates	
	Latitude	Longitude	Easting	Northing
Patch-1				
F1	640861.6903	2413540.1	82°21'46.286766"	21°49'12.44312"
F2	640848.0931	2413545.36	82°21'45.814889"	21°49'12.618064"
F3	640823.2817	2413547.293	82°21'44.951476"	21°49'12.688056"
F4	640811.3595	2413541.493	82°21'44.534524"	21°49'12.502891"
F5	640787.5147	2413513.46	82°21'43.695548"	21°49'11.598207"
F6	640777.2035	2413504.438	82°21'43.333704"	21°49'11.307804"
F7	640768.7005	2413499.276	82°21'43.36017"	21°49'11.142432"
F8	640769.4061	2413567.898	82°21'43.81706"	21°49'13.373531"
F9	641224.7037	2413802.661	82°21'59.9042"	21°49'20.876001"
F10	641364.9073	2413799.571	82°22'3.89047"	21°49'20.735092"
Patch-2				
F11	641376.9713	2413727.868	82°22'4.288418"	21°49'18.400118"
F12	641371.7438	2413799.451	82°22'4.128505"	21°49'20.729211"
F13	641434.5917	2413799.286	82°22'6.317036"	21°49'20.705703"
F14	641430.4406	2413726.599	82°22'6.150004"	21°49'18.343428"
Patch-3				
F15	641438.5837	2413837.561	82°22'6.467888"	21°49'21.949082"
F16	641435.8981	2413911.558	82°22'6.397249"	21°49'24.355949"
F17	641541.6857	2413965.123	82°22'10.97747"	21°49'26.67088"
F18	641546.5657	2413924.455	82°22'10.255098"	21°49'24.743324"
F19	641555.3561	2413897.08	82°22'10.55274"	21°49'23.850651"

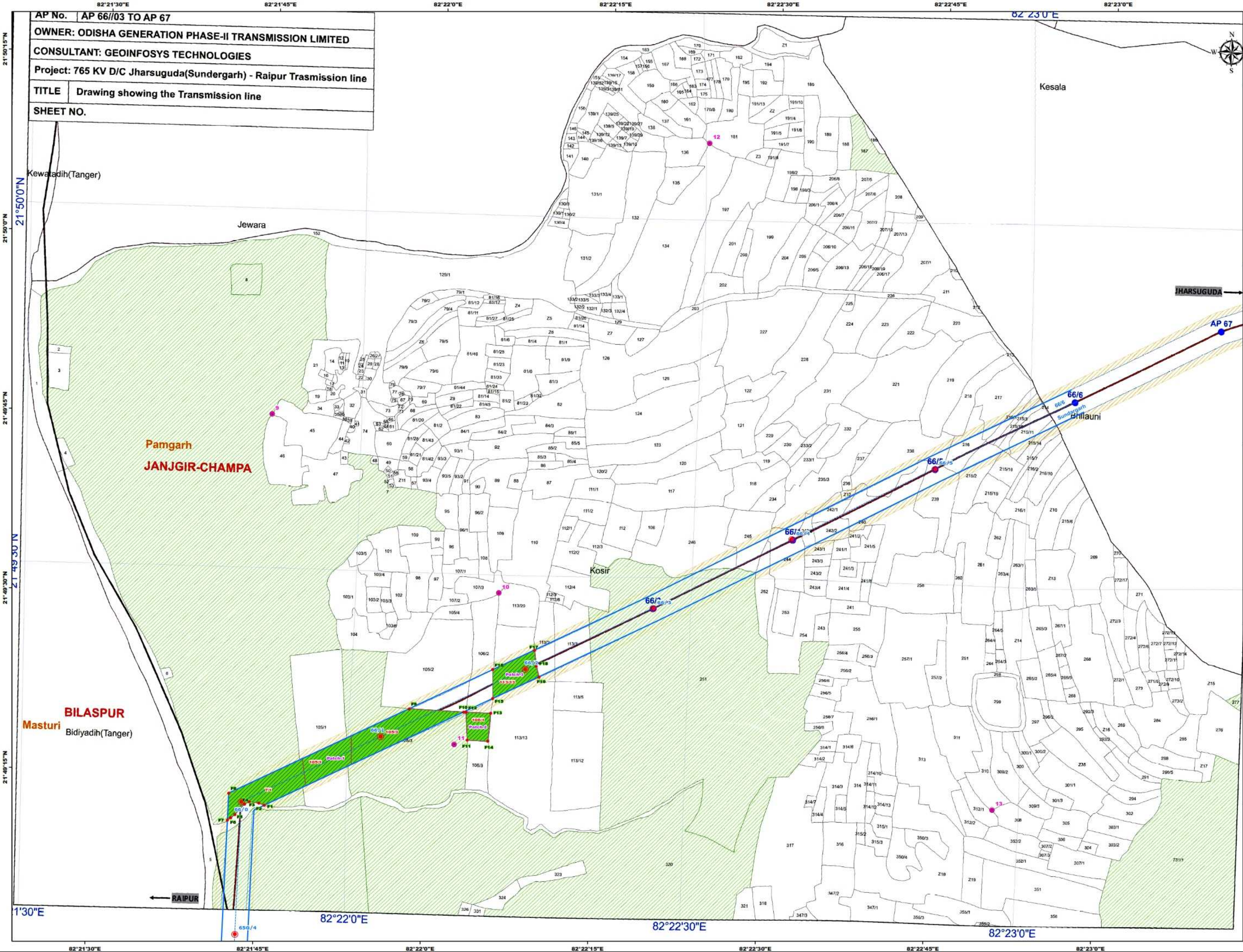
Area Statement:-

Village Name	Khasra No	Patch	Total Area (Hactare)	DGPS Area (Hactare)	Type of Land
kosir	7/1	Patch-1	47.571	1.087	Chhote Jhar ki Jungle
kosir	105/3	Patch-1	2.428	1.293	Chhote Jhar ki Jungle
kosir	105/1	Patch-1	2.428	0.89	Chhote Jhar ki Jungle
kosir	106/1	Patch-2	0.405	0.405	Chhote Jhar ki Jungle
kosir	113/13	Patch-3	0.121	0.121	C.G. Shasan
Total Area			52.953	3.796	

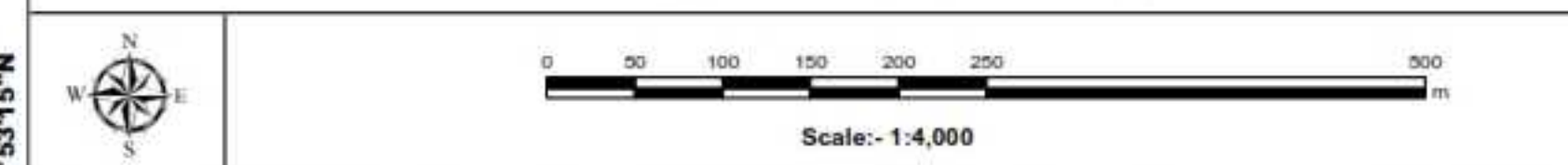


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DGPS Survey Conducted and Map Prepared by :-
Spatial Planning And Analysis Research Centre Pvt. Ltd.,
E/11,Infocity, Chandaka Industrial Estate,
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Map Showing DGPS Surveyed Co-ordinates and Boundary of Forest Area Proposed to be Diverted for 765KV D/C Jharsuguda (Sundargarh-Raipur) Transmission Line OF Odisha Generation Phase-II Transmission Limited (OGPTL) in Village-Baragadi & Champa, Tahasil-Charpara,Janjgir Champa Forest Division, District-Janjgir Champa,Chhatisgarh



LEGEND

- Observation Point
- AP Point
- Forest Plot
- Patch Boundary
- Forest Pillar
- Centre Line
- Alignment Boundary

CO-ORDINATES OF SCP/DGPS OBSERVATION POINT

Point-ID	Geographic Co-ordinates		UTM Co-ordinates	
	Latitude	Longitude	Easting	Northing
1	N21°53'20.70126"	E82°44'22.52973"	679721.485	2421567.521
2	N21°52'50.60293"	E82°43'47.06010"	678713.775	2420630.325
3	N21°52'59.79791"	E82°44'21.48738"	679698.842	2420924.279

CO-ORDINATES OF FOREST PILLAR

Pillar No	Geographic Co-ordinates		UTM Co-ordinates	
	Latitude	Longitude	Easting	Northing
Patch-4 (Bargadi)				
F20	677879.8634	2420416.562	82°43'17.930091"	21°52'43.957864"
F21	677878.5037	2420425.91	82°43'17.886379"	21°52'44.262258"
F22	677903.2715	2420423.938	82°43'18.748306"	21°52'44.189107"
Patch-5				
F23	678010.8127	2420509.004	82°43'22.527323"	21°52'46.915441"
F24	678005.4849	2420494.473	82°43'22.336075"	21°52'46.444999"
F25	678005.4849	2420465.176	82°43'22.324637"	21°52'45.492528"
F26	677983.0405	2420464.329	82°43'21.542536"	21°52'45.473169"
F27	677968.8391	2420514.843	82°43'21.67598"	21°52'47.120562"
F28	678020.6567	2420531.169	82°43'22.878859"	21°52'47.632446"
F29	678023.9703	2420510.552	82°43'22.986226"	21°52'46.960977"
Patch-6				
F30	678027.6355	2420518.234	82°43'23.116891"	21°52'47.209384"
F31	678026.6571	2420533.059	82°43'23.88601"	21°52'47.691718"
F32	678037.8211	2420536.577	82°43'23.478835"	21°52'47.802"
F33	678036.3607	2420519.523	82°43'23.421307"	21°52'47.24811"
Patch-7				
F34	678040.2167	2420467.085	82°43'23.535139"	21°52'45.541932"
F35	678034.3643	2420489.327	82°43'23.339979"	21°52'46.26716"
F36	678059.0663	2420491.87	82°43'24.201379"	21°52'46.340824"
F37	678076.503	2420488.237	82°43'24.807306"	21°52'46.21637"
F38	678087.4671	2420481.972	82°43'25.186754"	21°52'46.8691"
Patch-8 (Charpara)				
F39	679165.4125	2420945.119	82°44'2.915065"	21°53'0.671408"
F40	679079.0005	2420917.284	82°43'59.894205"	21°52'59.798192"
F41	679077.6497	2420932.628	82°43'59.853183"	21°53'0.297514"
F42	679158.9421	2420962.682	82°44'2.69659"	21°53'1.244739"
F43	679165.4125	2420945.119	82°44'2.915065"	21°53'0.671408"

Area Statement:-

Village Name	Khasra No	Patch	Total Area (Hactare)	DGPS Area (Hactare)	Type of Land
Baragadi	137	Patch-4	1.821	0.009	Chhote Jhar ki Jungle
Baragadi	131/1	Patch-5	1.214	0.181	Chhote Jhar ki Jungle
Baragadi	267	Patch-7	0.518	0.323	Chhote Jhar ki Jungle
Baragadi	269/1	Patch-6	0.825	0.021	Chhote Jhar ki Jungle
Charpara	44	Patch-8	3.497	0.148	Jungle
Total Area			7.875	0.682	

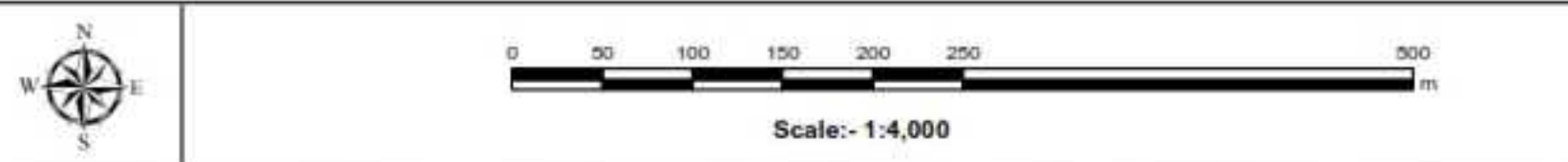


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Map Showing DGPS Surveyed Co-ordinates and Boundary of Forest Area Proposed to be Diverted for 765KV D/C Jharsuguda (Sundargarh-Raipur) Transmission Line OF Odisha Generation Phase-II Transmission Limited (OGPTL) in Village-Khamria & Akalsara, Tahasil-Jajaiapur,Janjgir Champa Forest Division, District-Janjgir Champa,Chhatisgarh



LEGEND

● Observation Point	● AP Point	■ Forest Plot	▭ Patch Boundary
● Forest Pillar	--- Centre Line	▭ Alignment Boundary	

CO-ORDINATES OF SCP/DGPS OBSERVATION POINT

Point-ID	Geographic Co-ordinates		UTM Co-ordinates	
	Latitude	Longitude	Easting	Northing
4	N21°56'09.48607"	E82°52'28.17581"	693598.588	2426922.927
5	N21°54'54.33305"	E82°50'30.32470"	690244.457	2424570.432
6	N21°54'52.64887"	E82°51'40.69032"	692264.605	2424542.997
8	N21°56'19.53746"	E82°51'03.56855"	691166.939	2427202.585

CO-ORDINATES OF FOREST PILLAR

Pillar No	Geographic Co-ordinates		UTM Co-ordinates	
	Latitude	Longitude	Easting	Northing
Patch-9				
F44	692621.2793	2425150.457	82°51'53.3731"	21°55'12.255073"
F45	692657.2247	2425135.623	82°51'54.619104"	21°55'11.758666"
F46	692662.8593	2425139.524	82°51'54.81706"	21°55'11.883251"
F47	692662.8593	2425159.259	82°51'54.825418"	21°55'12.524773"
F48	692669.0879	2425165.072	82°51'55.44875"	21°55'12.711288"
F49	692684.5909	2425148.121	82°51'55.577798"	21°55'12.154122"
F50	692604.4655	2425075.366	82°51'52.755537"	21°55'9.820711"
F51	692565.3375	2425108.564	82°51'51.406431"	21°55'10.915356"
F52	692550.3579	2425116.735	82°51'50.888021"	21°55'11.186886"
F53	692603.0825	2425164.61	82°51'52.745142"	21°55'12.722347"
Patch-10				
F54	693297.4155	2425772.635	82°52'17.193134"	21°55'32.212799"
F55	693259.4925	2425771.794	82°52'15.871544"	21°55'32.200493"
F56	693253.4023	2425738.021	82°52'15.64501"	21°55'31.105052"
F57	693275.6519	2425742.027	82°52'16.421884"	21°55'31.226441"
F58	693260.4771	2425691.702	82°52'15.87181"	21°55'29.596534"
F59	693195.9851	2425633.533	82°52'13.600218"	21°55'27.731178"
F60	693162.0683	2425653.946	82°52'12.427242"	21°55'28.408199"
F61	693105.9133	2425642.519	82°52'10.465972"	21°55'28.58976"
F62	693347.9915	2425860.864	82°52'18.992708"	21°55'35.60817"
F63	693339.6689	2425830.434	82°52'18.689809"	21°55'34.74936"

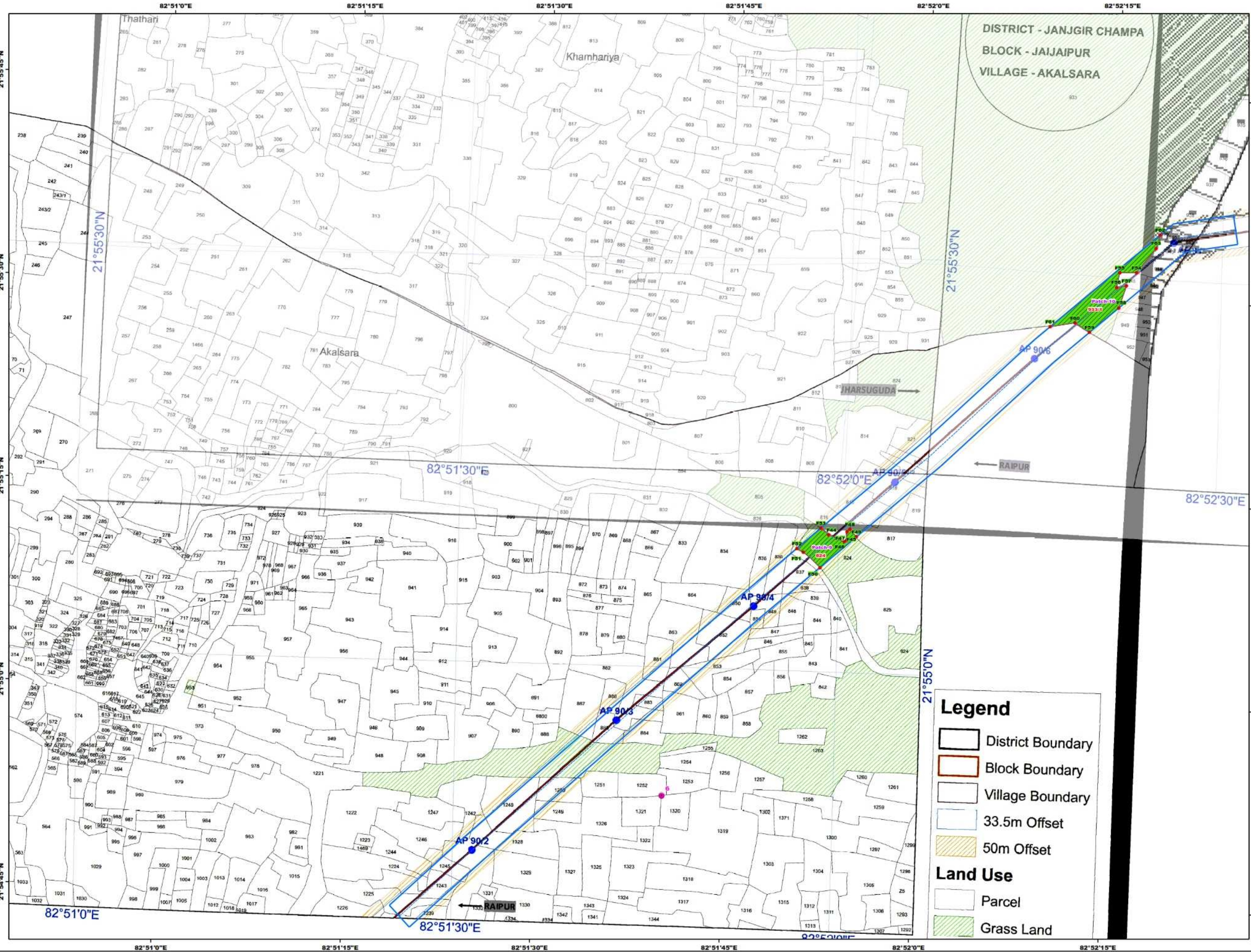
Area Statement:-

Village Name	Khasra No	Patch	Total Area (Hactare)	DGPS Area (Hactare)	Type of Land
Akalsara	824	Patch-9	32.971	0.589	Chhote Jhar ki Jungle
Khamria	933/1	Patch-10	69.471	1.215	Bade Jhar ki Jungle
Total Area			102.442	1.804	

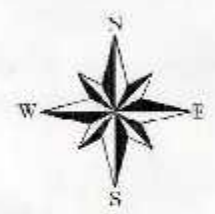


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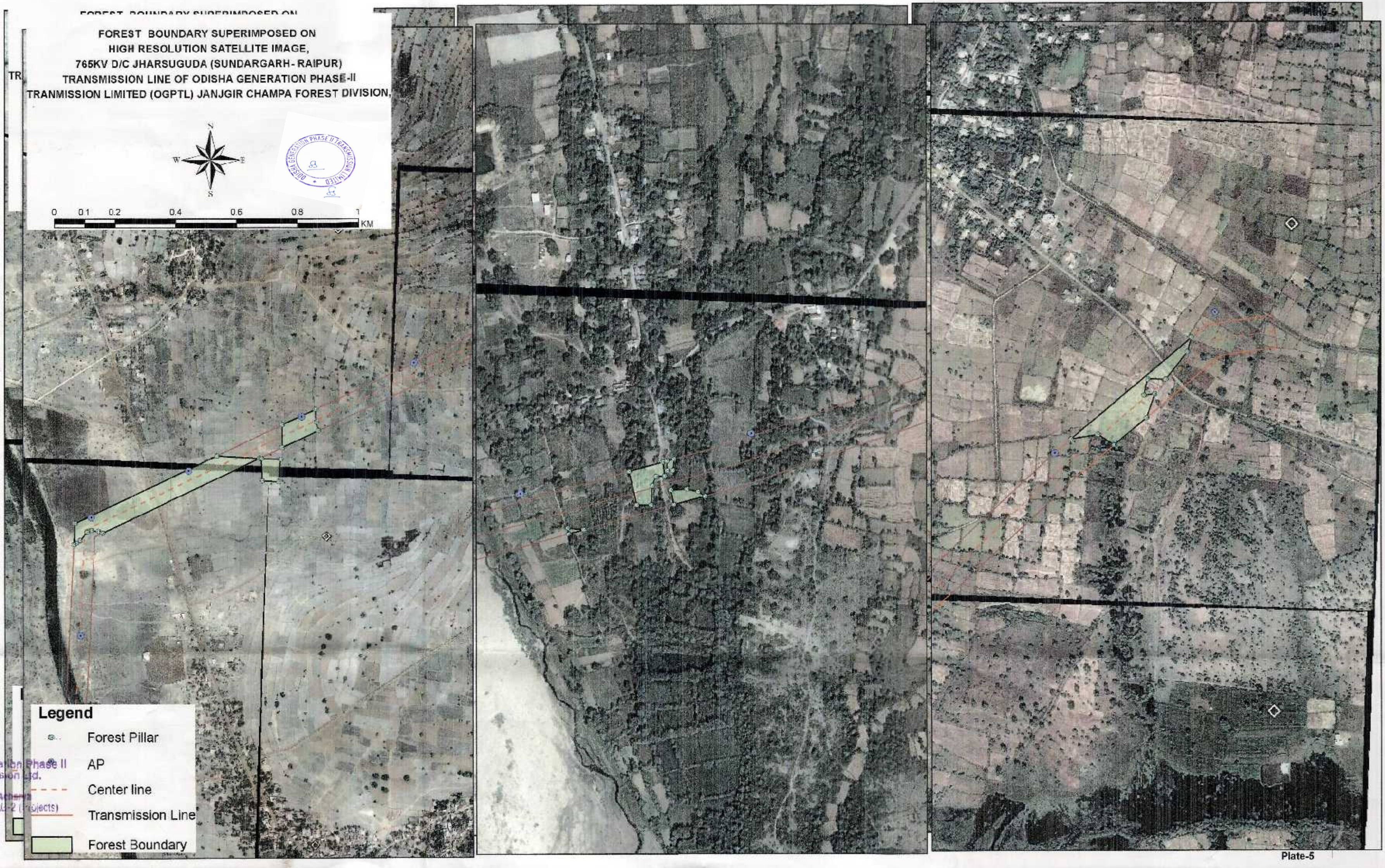
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FOREST BOUNDARY SUPERIMPOSED ON
 FOREST BOUNDARY SUPERIMPOSED ON
 HIGH RESOLUTION SATELLITE IMAGE,
 765KV D/C JHARSUGUDA (SUNDARGARH- RAIPUR)
 TRANSMISSION LINE OF ODISHA GENERATION PHASE-II
 TRANSMISSION LIMITED (OGPTL) JANJGIR CHAMPA FOREST DIVISION,



0 0.1 0.2 0.4 0.6 0.8 1
 KM



- Legend**
- Forest Pillar
 - AP
 - Center line
 - Transmission Line
 - Forest Boundary

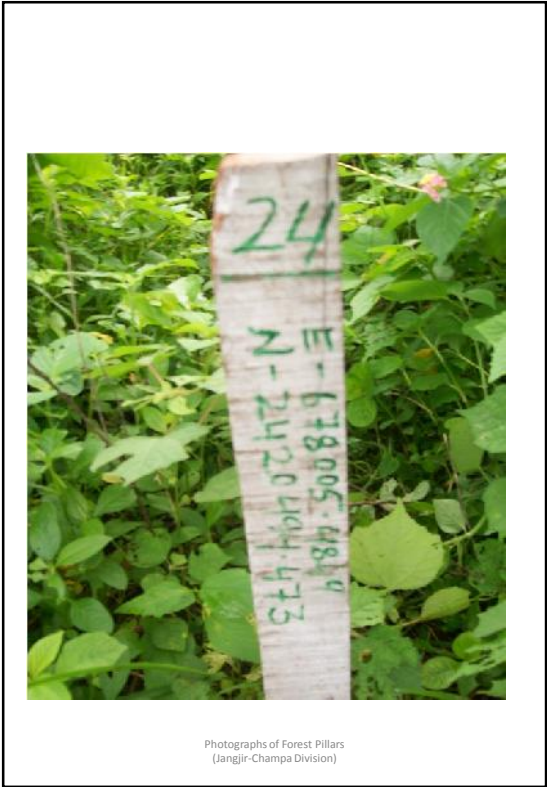
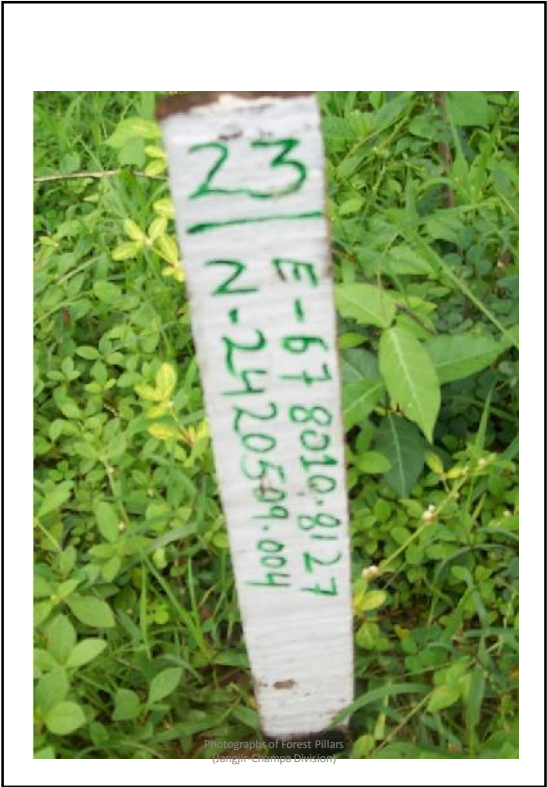






















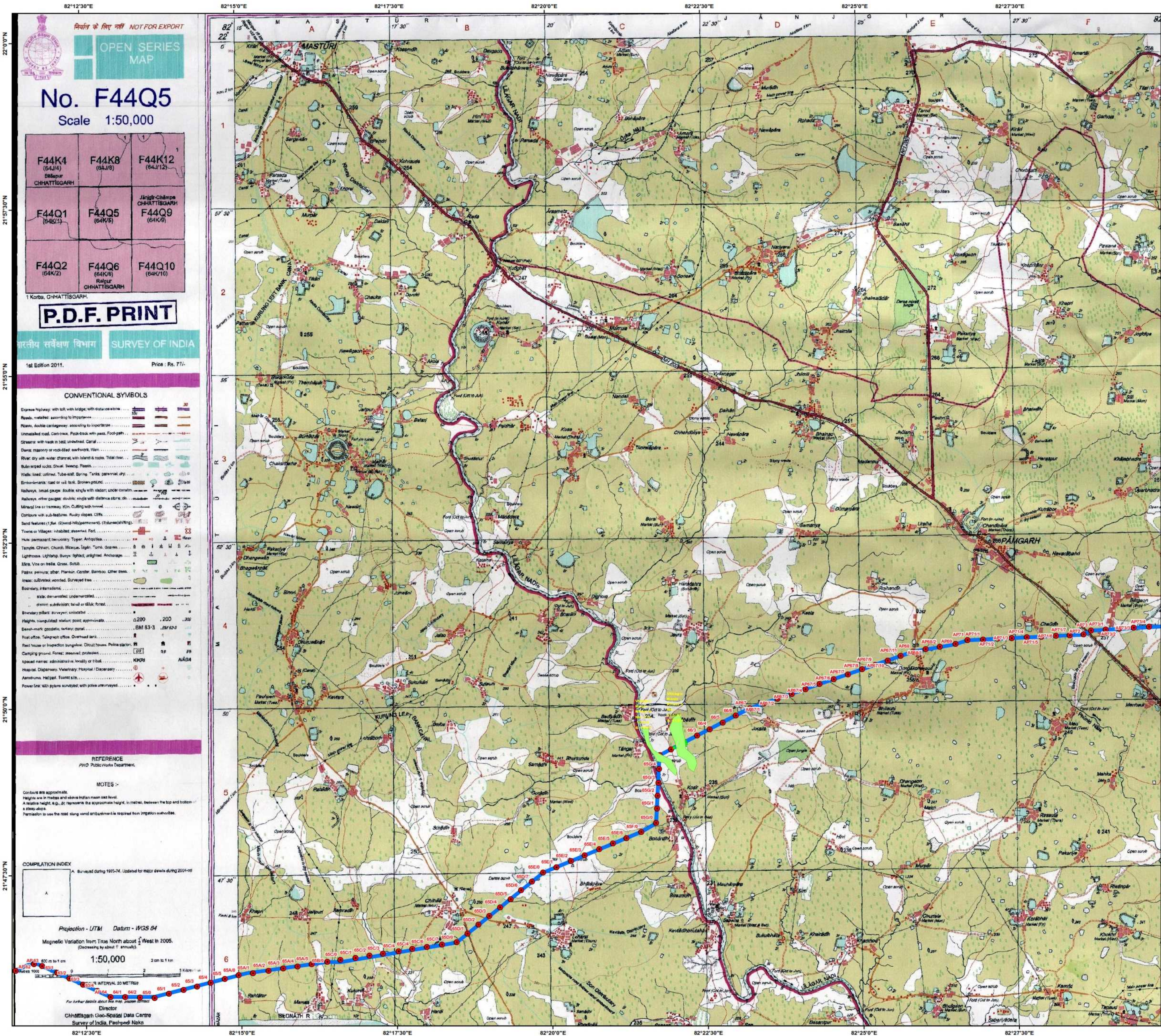




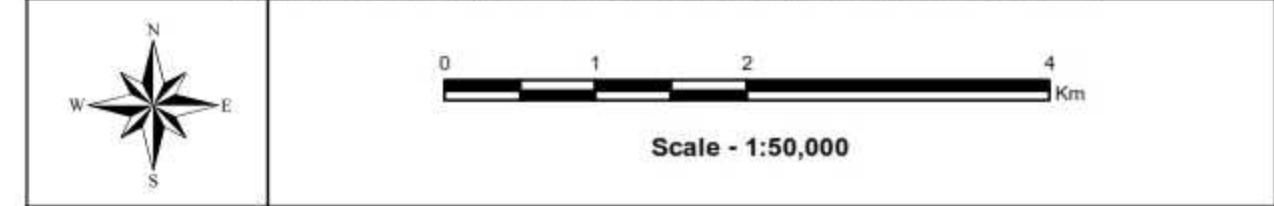








TOPOGRAPHICAL MAP NO. F44Q5 OF
LINE SHOWING DGPS CO-ORDINATES IN PROPOSED FOREST
DIVERSION AREAS OF 765KV D/C JHARSUGUDA
(SUNDARGARH)-RAIPUR TRANSMISSION LINE OF
ODISHA GENERATION PHASE-II TRANSMISSION LIMITED
(OGPTL), JANJIGIR CHAMPA FOREST DIVISION,
DISTRICT-JANJIGIR CHAMPA, CHHATTISGARH



Legend

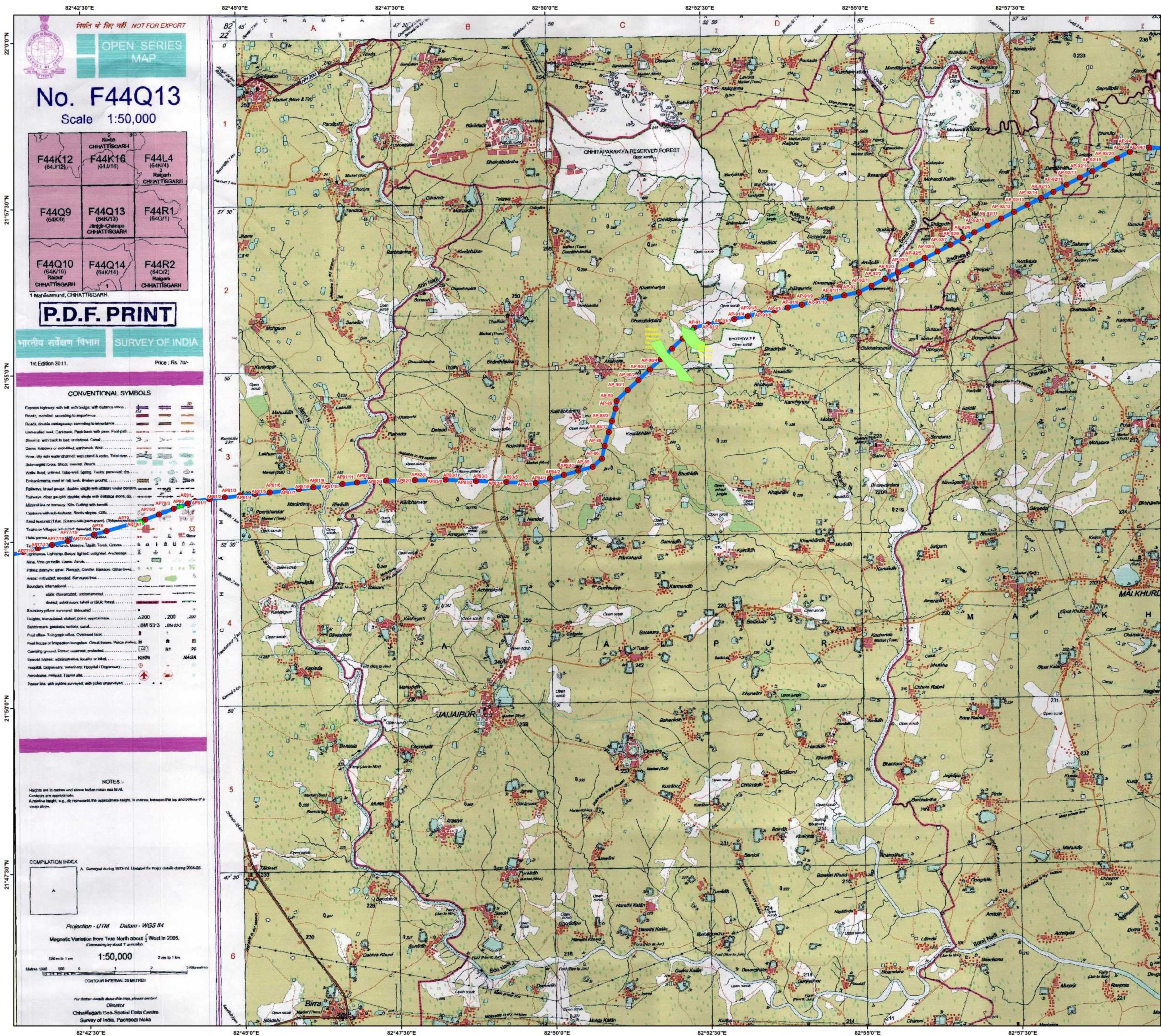
● Forest Pillar □ Forest Patch — Transmission Line

Sl No	Village Name	Khasra No	Area in Ha.	Forest Type	Tower Involved	Tower Co-ordinates in Easting	Tower Co-ordinates in Northing
1	Kosir	7/1	1.087	Chhote Jhar ki Jungle	AP66/0	640823.000	2413589.000
2	Kosir	105/3	1.293	Chhote Jhar ki Jungle	AP66/0	640823.000	2413589.000
3	Kosir	113/13	0.121	Chhote Jhar ki Jungle	66/2	641498.296	2413939.808
4	Kosir	105/1	0.890	Chhote Jhar ki Jungle	66/1	641135.348	2413751.261
5	Kosir	106/1	0.405	C.G. Shasan	66/1	641135.348	2413751.261
Total Area			3.796				

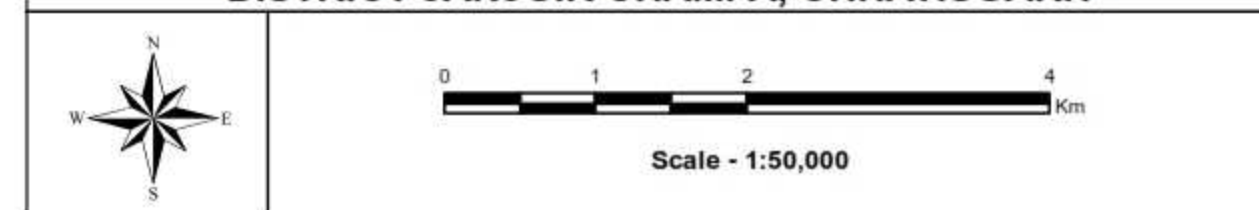


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**TOPOGRAPHICAL MAP NO. F44Q13 OF
LINE SHOWING DGPS CO-ORDINATES IN PROPOSED FOREST
DIVERSION AREAS OF 765KV D/C JHARSUGUDA
(SUNDARGARH)-RAIPUR TRANSMISSION LINE OF
ODISHA GENERATION PHASE-II TRANSMISSION LIMITED
(OGPTL), JANJIGIR CHAMPA FOREST DIVISION,
DISTRICT-JANJIGIR CHAMPA, CHHATISGARH**



Legend

Forest Pillar Forest Patch Transmission Line

Sl No	Village Name	Khasra No	Area in Ha.	Forest Type	Tower Involved	Tower Co-ordinates in
1	Khamriya	933/1	1.215	Bade Jhar ki Jungle	AP90/6	693074.351 2425612.370
2					AP91	693393.996 2425913.942
3	Akalsara	824	0.589	Chhote Jhar ki Jungle	AP90/4	692463.972 2425036.733
4					AP90/5	692776.800 2425331.755
Total Area			1.804			



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