



ACHANAKMAR TIGER RESERVE, MUNGELI

DGPS survey of land identified for Compensatory Afforestation
of 255.300 Ha. in lieu of Relocation of Villages Tilaidabra,
Birarpani, & Chhirhatta from core area of Achanakmar Tiger
Reserve, Mungeli



DGPS SURVEY AND GIS MAPPING DONE BY:
Geotrax International Services
Raipur, Chhattisgarh.



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1. Introduction and Background

Relocation of Villages

1.1 Background

Total area of Achanakmar Tiger Reserve is 914.017 Square Kilometer, In which total Core area is 625.195 square kilometer and total Buffer area is 287.822 square kilometer. ATR are total 19 villages in Core area and 5 villages in Buffer area.

National Tiger Conservation Authority, According to guideline given by New Delhi F No. 3-1/2003-PT (Relocation) Feb 2008 in relation to keeping the core area of the Tiger Reserve to the non-people area, the relocation of the village which is situated in the Core Area of ATR has been proposed under the National Rehabilitation Policy 2013.

In the second phase, from the core area of ATR, it has been proposed to relocate three villages, Tilaidabra forest range Chhaparwa, & Birarpani and Chirhatta forest range Lormi.

1.2 Location and Communication of Proposed Relocated Villages

The location of the proposed Relocate villages are coming within Latitude 22°18'20.58"N to 22°20'22.06"N and Longitude 81°41'57.81"E to 81°42'49.24"E at Bharatpur & Latitude 22°17'18.29"N to 22°18'23.85"N and Longitude 81°47'08.44"E to 81°47'56.42"E at Sawatpur in the district of Mungeli, Chhattisgarh.

The details of the land proposed to be acquired for relocation of villages is given below.

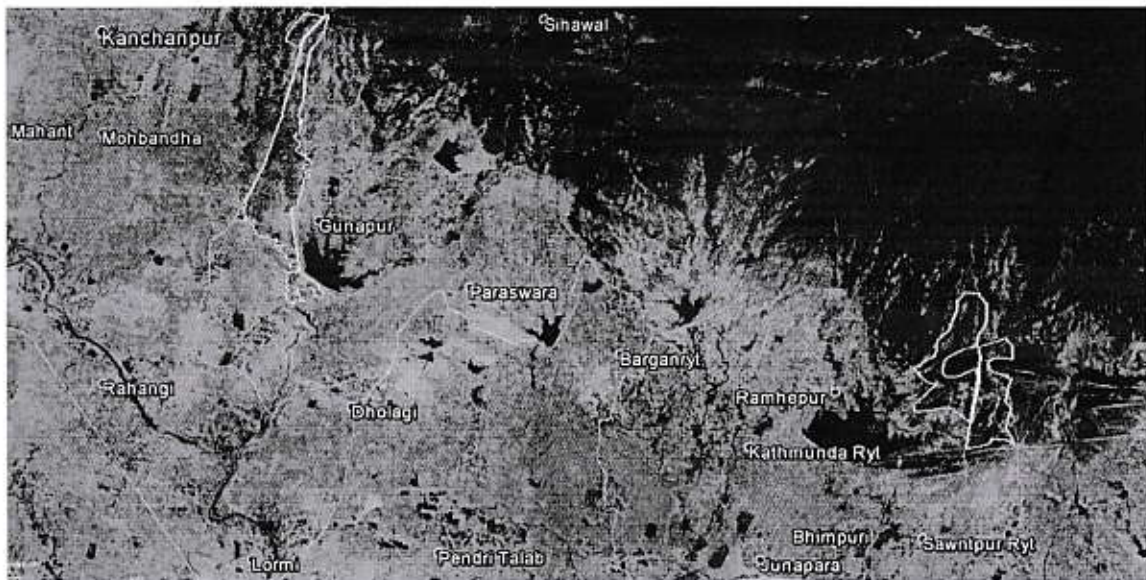


Fig-1: Satellite Imagery showing location of proposed Ca Land in Lormi Range, Division-Mungeli.

1.3 Objective

As per directives of Ministry of Environment & Forests (MoEF) dated 8th July 2011; all applications for prospecting purpose in forest land under Forest Conservation Act, 1980 must be accompanied with Geo-referenced shape file, showing the boundary of the proposed area (both soft copy and hard copy maps), prepared using Differential GPS (DGPS) and the same should be uploaded to MoEF website along with the online application.

As per Forest Conservation Act, 1980, para 3.2 (iv) of the guidelines issued "3.2(iv) Where non-forest land are not available or non-forest land is available in less extend to the forest area being diverted, compensatory afforestation may be carried out over degraded forest twice in extend to the area being diverted to the difference between forest land being diverted and available non-forest land, as the case may be"



To meet this requirement of MoEF, Achanakmar Tiger Reserve, Mungeli has entrusted M/s Geotrax International Services, Raipur, which is an empanelled agency (here in after called as DGPS Agency) of Directorate of Geology and Mines, Chhattisgarh (Ref. Circular No. F-7-14/2013/12, dated. 10.11.2014) for conducting DGPS & GIS mapping of 255.300 Hectares of compensatory afforestation land located in Lormi Range & under Mungeli Forest Division of Mungeli district, Chhattisgarh.

2. Scope of Work

1. Establishment of one Primary base station with 72 Hours observation and secondary base control points with 4 hours observation near the CA Land sites.
2. DGPS Survey for collection of ground coordinates along the CA Land boundary (Intermediate point fixed at every 50m interval and/or at every turn/bend along the boundary of the sites)
3. Data processing and Interpretation
 - a. Geo-referencing of Stock(Forest) Maps (Map Scale-1:15000).
 - b. Preparation of Geo-referenced map of the CA Land area using the DGPS Surveyed data.
 - c. Superimposition of Geo-referenced CA Land boundary on Stock Maps and SOI Toposheet.
 - d. Computation of total area of proposed CA Land sites and creation of tabular report indicating coordinates (latitude and longitude) of the vertices (at every turn/bend) for each CA Land site.
 - e. Computation of total Perimeter of CA Land Boundary.
 - f. Preparation of DGPS survey report along with soft copy of – maps in shapefile format and kml file.
 - g. Printing of DGPS Survey report and Geo-referenced maps (2 sets) and Technical compliance.
4. Establishment of permanent RCC pillars at boundary corner of the CA Land sites after the final acceptance of the survey report.

3. Deliverables

The deliverables envisaged for the assignment are described below:

1. DGPS Coordinates.
2. DGPS Reports - Base line & network adjustment report for the primary and Secondary Control Points.
3. Geo-referenced Stock maps & SOI Toposheet maps based on DGPS observations – Hard and Soft Copy (SHP and KML formats).
4. Lease Boundary area statement as per DGPS Survey.
5. DGPS Survey and Mapping report.

4. Brief description of the Technical approach

4.1 Input Data

ATR Mungeli, has provided the details (location and approx. area) of the sites identified for compensatory afforestation in lieu of relocation of villages Tilaidabra, Birarpani, & Chhirhatta from core area of Achanakmar Tiger Reserve. The 255.300 Ha land has been identified and proposed as suitable for CA land. It falls in Mungeli forest division of Chhattisgarh. Based on the input provided, DGPS Survey plan is created.

4.2 Planning DGPS Survey

Based on the input data (maps) the location of DGPS base station - Primary and Secondary Control Points (PCP and SCP) in the project area are planned. One PCP with 72 hours observation was planned and established in Koni Forest Guest House, Bilaspur. Based on the CA land site details provided by ATR, Secondary Control Points (SCP) locations were planned using satellite imagery. For the establishment of SCP coordinates a DGPS Static Observation for at least 3 hours duration at each of the Secondary Control Points is planned.



Fig-2: Satellite Image showing the location of the Primary Control Point in Bilaspur.

4.3 Establishment of Primary Control Point

The primary Control Point (PCP) with 72 hours of DGPS Observation was established as the DGPS base station in Bilaspur. Bilaspur-PCP was established in the Koni Forest Guest House, Bilaspur. The 72 hours of observation was carried out using DGPS. As per Survey of India (SOI) Guideline, the PCP has to be fixed through continuous observation for 72 hours duration. The observed data was processed with reference to the data of International GNSS Service (IGS) stations as per SOI guideline (IGS processed report is enclosed as Annexure-1).

The coordinate of the PCP is as follows:

Point ID	Latitude (d:m:s)	Longitude (d:m:s)	Ellipsoidal Height(m)
Bilaspur -PCP	22°06'49.35084"N	82°08'27.44597"E	213.16



Fig-3: Image showing Bilaspur Primary Control Point (PCP)

4.4 Establishment of Secondary Control Points (SCP)

The Secondary Control Point (SCP) with 2-4 hours of static observation was established at various locations. The SCP's were established in static mode and the DGPS data was processed with reference to the Primary Control Point. The static data is Post Processed using Trimble Business Centre software for obtaining the SCP coordinates.

4.4.1 Bharatpur SCP Location

Point ID	Latitude (d:m:s)	Longitude (d:m:s)	Ellipsoidal Height (m)
Bharatpur - SCP	22°19'04.13400"N	81°41'59.87400"E	271.24

4.5 DGPS Survey Procedure

DGPS survey was carried out using a pair of DGPS instrument. One DGPS Instrument was used as Base Station. The Base station for the survey was established at the nearest Secondary Control Point. The distance between the Base Station TBM and rover was always less than 5km.

The other DGPS instrument was working as Rover. The survey was conducted in Real Time Kinematic (RTK) mode. The Survey team carried out DGPS Survey of boundary points by walking along the compartment boundary. DGPS readings were collected at every 50m distance along compartment boundary and at every turn or bend.

4.6 Creation of Vector Layers of the Compartment Boundary

The surveyed points captured through DGPS were plotted in the GIS Software and the boundary line was created by joining the points. The boundary polygon was created using the polylines. The boundary pillar coordinates are computed and the final compartment boundary polygon is created. After Geo-referencing the Forest Map and SOI Toposheet, the boundary layer is superimposed on it. For each site a map layout showing the total area is prepared and printed along with a table showing the coordinates of pillar points.

4.7 Specification of DGPS Equipment

Geotrax deployed the most advance and hi-precision devices to carry out the DGPS survey. The DGPS performance specifications are given below. The corresponding fact sheets are placed below for ready reference.

COMNAV

T300 GNSS Receiver



Features

- *Ultra small*
- *Super light*
- *Many user-friendly conveniences built in*
- *GPS L1/L2/L5, BeiDou B1/B2/B3, GLONASS L1/L2*
- *Low power consumption*
- *Support long baseline E-RTK¹*

RTK robust enough for challenging environments, in a device that is light and easy to carry

With decades of experience in the surveying GNSS receiver, the T300 is a product which combines lots of market proved advantages together. It can track all the working GNSS constellations. By using ComNav's unique QUAN™ algorithm technology, it can function in RTK mode with all the GNSS constellations or by using any single GNSS constellation such as GLONASS or BeiDou. The strong anti-interference ability of the receiver makes it possible to work in any environment.

Design driven to improve user experience

Our R&D people are always thinking about how to improve the physical experience of users and workflow in the field. With this in mind, the T300 integrates a cutting edge GNSS board, Bluetooth®, UHF (Rx&Tx) into a compact board. Smart design makes the T300 the lightest and smallest (volume) receiver in the world.

Hot swap battery design

Extending the field working time is also a passion for our R&D people. They do lots of tests and analysis to reduce the power consumption, and make the whole system work more efficiently. In parallel, they've designed in the capability to hot swap the battery source. When the warning sounds and LED flashes, put your second battery in place. Then recharge the first while you keep working.

Consumer grade batteries... always available

Losing power in the field is significantly inconvenient for users, as the batteries for GNSS receivers are often unusual types and not readily available. Once again our R&D people developed a solution so that the T300 runs on normal consumer batteries.

Technical Specifications

T300

Signal Tracking

- 256 channels with simultaneously tracked satellite signals
- GPS: L1 C/A, L1 C, L2 P, L5
- BeiDou: B1, B2, B3
- GLONASS: L1, L2
- SBAS: WAAS, EGNOS, MSAS, GAGAN

Performance Specifications

- Cold start: <50 s
- Warm start: <30 s
- Hot start: <15 s
- Initialization time: <10 s
- Single re-acquisition: <2 s
- Initialization reliability: >99.9%

Positioning Specifications

- Post Processing Static
- Horizontal: 2.5 mm + 0.5 ppm RMS
- Vertical: 5 mm + 0.5 ppm RMS
- Real Time Kinematic
- Horizontal: 8 mm + 1 ppm RMS
- Vertical: 15 mm + 1 ppm RMS
- E-RTK¹ (baseline < 100 km)
- Horizontal: 0.2 m + 1 ppm RMS
- Vertical: 0.4 m + 1 ppm RMS
- Code differential GNSS positioning
- Horizontal: 0.25 m + 1 ppm RMS
- Vertical: 0.5 m + 1 ppm RMS
- SBAS: Typically <1 m 3D RMS
- Standalone: <1.5 m 3D RMS

Communications and Memory

- 1 Serial port (7 pin Lemo).
- Baud rates up to 921,600 bps.
- Radio modem: Tx/Rx with full frequency range from 410-470 MHz²
- Transmit power: 0.5-2W adjustable
- Range: 1-4 km
- Position data output rates: 1 Hz, 2 Hz, 5 Hz, 10 Hz
- 5 LEDs (indicating Power, Satellite Tracking, Bluetooth[®] and Differential Data)
- Bluetooth[®]: V 2.X protocol, work compatible with Windows 7, Windows mobile and Android

Data Format

- Correction data I/O:
 - RTCM 2.x, 3.x, CMR (GPS only), CMR+ (GPS only).
- Position data output:
 - ASCII: NMEA-0183 GSV, RMC, HDT, VHD, GGA, GSA, ZDA, VTG, GST, PJK, PTNL
 - ComNav Binary update to 20 Hz

Physical

- Size(W×H): 15.8 cm × 7.5 cm
- Weight: 0.95 kg (include 2 batteries)

Environmental

- Operating temperature: -40 °C to +65 °C (40 °F to 149 °F)
- Storage temperature: -40 °C to +85 °C (40 °F to 185 °F)
- Humidity: 100% condensation
- Waterproof and dust proof: IP67 protected from temporary immersion to depth of 1 meter, floats
- Shock: survives a 2 meter drop on to concrete

Electrical

- Input Voltage: 5-27 VDC
- Power consumption: 2.85 W (3 constellations)³
- Li-ion battery capacity: 2 × 1800 mAh, up to 8 hours typically
- Memory: 256 MB internal with up to 16 GB pluggable memory card

Software

- ComNav field data collection software CGSurvey
- Carlson's SurvCE field data collection software (optional)
- MicroSurvey's FieldGenius field data collection software (optional)

¹ E-RTK, BeiDou B3 signal used in RTK calculate engine; concern the current situation, this mode can be used in APAD.

² 410-470 MHz, 3 frequency range, 410-430, 430-460, 460-470, need to clarify when place the order.

³ Power consumption will increase if using internal radio modem transmitter.

Specifications subject to change without notice.

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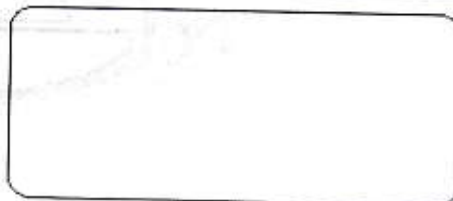
ComNav Technology Ltd.
Building E, No.50 Alley 2080 Lianhua Road
201103 Shanghai - China

Tel: +86 21 64056796

Fax: +86 21 54309582

Email: sales@comnavtech.com

www.comnavtech.com





4.8 Company Profile: Geotrax

Geotrax International Services (www.geotrax.in) is a Professional Land Mapping and Services provider across India established in the year 1999. During the last 14+ years, we had an opportunity to execute a variety of surveying jobs all over India and in the Middle East to various customer specifications for RIS, LIS, and Municipal GIS oriented jobs. Cadastral Surveys using ETS/DGPS and Provision of Ground control conforming to stringent accuracy standards using high end instruments as RTK/GPRS DGPS is our specialty. We also have a UAV (Drone) and Ground Penetrating Radar (on Roaster).

Geotrax is headed by Mr. V.V.S Bandhakavi (Ex-employee, Survey of India) who has more than 40+ years' experience in the field of surveying in India and abroad.

Some of our major clients include:

- Odisha Space Application Centre (ORSAC)
- Steel Authority of India (SAIL)
- National Thermal Power Corporation (NTPC)
- Survey Settlement and Land Records Department (Govt. Of Gujarat)
- Survey Settlement and Land Records Department (Govt. Of Madhya Pradesh)
- Irrigation Dept. (Govt. of Jammu and Kashmir)
- National Remote Sensing Agency (Hyderabad)
- Meinhardt India Private Limited (Delhi),
- Nagarjuna Construction Company (NCC, Hyderabad)
- Consulting Engineering Services (CES, New Delhi)
- Lee Associates of South Asia (LASA, Delhi)
- Power development Corporation (Govt. of Jammu and Kashmir)



Geotrax expertise covers:

- ❖ DGPS Surveys for Mining lease boundary, and Forest Diversion
- ❖ Consultancy services for Mining Plan & EIA
- ❖ Boundary and cadastral surveys using DGPS and Total station;
- ❖ Topographic surveys.
- ❖ Ground control surveys for photogrammetric projects, including Airborne GPS.
- ❖ Only one of the two companies in India who are empanelled by NRSA for DGPS survey for ground control point collection
- ❖ Route and alignment surveys combining conventional and photogrammetric methods.
- ❖ Construction and cross-section surveys (from road design to precision layout and quality control).

Being a client focused organization, Geotrax's combination of survey equipment, personnel, and computer resources allow for the tailoring of the project approach to match the orders of accuracy and precision requirements for each project. Geotrax's equipment resources include 250 DGPS, 33 hand-held GPS units, theodolites, electronic digital and automatic levels, 19 Electronic Total Stations, and data collectors.

On the mapping side, our CAD and GIS professionals assist the survey projects by creating accurate maps. We have dedicated CAD experts who have extensive experience with different CAD software.

5. DGPS Survey Results

For each site identified for compensatory Afforestation in lieu of Relocation of villages from core area of Achanakmar Tiger Reserve, a geo-referenced map showing the boundary of the sites along with an area statement is prepared. The DGPS coordinates of the pillars of each site is in Annexure-1. The geo-referenced maps showing the location of the sites are in Annexure -3.

Total Area Proposed in Mungeli district for CA is 255.300 Ha.

SCHEDULE OF PROPOSED AREA FOR RELOCATION OF VILLAGES						
Sr. No.	Patch No	Division	Range	Compartment Type	Compartment No.	Proposed Area(Ha)
1	Patch No-1	Mungeli	Lormi(T)	Reserve Forest	558	119.389
2	Patch No-2				557	9.411
3	Patch No-3				96	73.253
4	Patch No-4					53.247
Total Proposed Area						255.300

6. Annexure

6.1 Annexure – 1: DGPS Surveyed Pillar coordinates of CA Land Sites- Datum: WGS 84, Projection: UTM Zone 44 N

6.1.1. DGPS Surveyed Pillar coordinates of Village: Bharatpur.

Sr. No.	Patch No	Point ID	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
1	Patch No-1	P-1	573225.151	2470555.141	22°20'21.44528"	81°42'39.93713"
2	Patch No-1	P-2	573240.041	2470569.300	22°20'21.90348"	81°42'40.45998"
3	Patch No-1	P-3	573253.261	2470571.733	22°20'21.98057"	81°42'40.92255"
4	Patch No-1	P-4	573265.775	2470568.237	22°20'21.86493"	81°42'41.35942"
5	Patch No-1	P-5	573279.831	2470549.338	22°20'21.24818"	81°42'41.84768"
6	Patch No-1	P-6	573278.053	2470536.686	22°20'20.83700"	81°42'41.78344"
7	Patch No-1	P-7	573271.647	2470521.769	22°20'20.35287"	81°42'41.55701"
8	Patch No-1	P-8	573263.448	2470516.072	22°20'20.16885"	81°42'41.26948"
9	Patch No-1	P-9	573255.726	2470476.807	22°20'18.89315"	81°42'40.99303"
10	Patch No-1	P-10	573245.333	2470427.917	22°20'17.30480"	81°42'40.62168"
11	Patch No-1	P-11	573228.910	2470364.985	22°20'15.26074"	81°42'40.03719"
12	Patch No-1	P-12	573210.376	2470335.342	22°20'14.29957"	81°42'39.38439"
13	Patch No-1	P-13	573185.115	2470292.222	22°20'12.90116"	81°42'38.49425"
14	Patch No-1	P-14	573157.695	2470250.462	22°20'11.54728"	81°42'37.52882"
15	Patch No-1	P-15	573128.293	2470210.127	22°20'10.24009"	81°42'36.49439"
16	Patch No-1	P-16	573094.879	2470172.932	22°20'09.03558"	81°42'35.32022"
17	Patch No-1	P-17	573050.042	2470117.258	22°20'07.23191"	81°42'33.74370"
18	Patch No-1	P-18	573039.899	2470080.077	22°20'06.02431"	81°42'33.38301"
19	Patch No-1	P-19	573032.780	2470040.792	22°20'04.74782"	81°42'33.12768"
20	Patch No-1	P-20	573023.396	2469991.727	22°20'03.15363"	81°42'32.79159"
21	Patch No-1	P-21	573010.753	2469943.352	22°20'01.58238"	81°42'32.34168"
22	Patch No-1	P-22	572995.651	2469878.074	22°19'59.46183"	81°42'31.80306"
23	Patch No-1	P-23	572992.676	2469836.902	22°19'58.12333"	81°42'31.69229"
24	Patch No-1	P-24	572987.958	2469795.643	22°19'56.78228"	81°42'31.52059"
25	Patch No-1	P-25	572980.366	2469746.287	22°19'55.17835"	81°42'31.24710"
26	Patch No-1	P-26	572977.719	2469696.445	22°19'53.55787"	81°42'31.14639"
27	Patch No-1	P-27	572973.821	2469646.600	22°19'51.93747"	81°42'31.00194"
28	Patch No-1	P-28	572975.273	2469596.802	22°19'50.31778"	81°42'31.04450"
29	Patch No-1	P-29	572967.256	2469547.561	22°19'48.71766"	81°42'30.75618"
30	Patch No-1	P-30	572959.548	2469498.202	22°19'47.11366"	81°42'30.47864"

Sr. No.	Patch No	Point ID	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
31	Patch No-1	P-31	572950.920	2469449.026	22°19'45.51576"	81°42'30.16896"
32	Patch No-1	P-32	572935.334	2469401.718	22°19'43.97964"	81°42'29.61640"
33	Patch No-1	P-33	572917.130	2469355.210	22°19'42.46995"	81°42'28.97243"
34	Patch No-1	P-34	572904.508	2469306.917	22°19'40.90136"	81°42'28.52331"
35	Patch No-1	P-35	572900.457	2469257.254	22°19'39.28692"	81°42'28.37353"
36	Patch No-1	P-36	572919.521	2469224.705	22°19'38.22547"	81°42'29.03459"
37	Patch No-1	P-37	572934.567	2469209.873	22°19'37.74082"	81°42'29.55809"
38	Patch No-1	P-38	572947.956	2469203.636	22°19'37.53597"	81°42'30.02507"
39	Patch No-1	P-39	572949.505	2469197.548	22°19'37.33774"	81°42'30.07822"
40	Patch No-1	P-40	572936.525	2469172.583	22°19'36.52785"	81°42'29.62041"
41	Patch No-1	P-41	572928.292	2469175.642	22°19'36.62859"	81°42'29.33312"
42	Patch No-1	P-42	572925.274	2469198.097	22°19'37.35930"	81°42'29.23130"
43	Patch No-1	P-43	572916.492	2469201.607	22°19'37.47478"	81°42'28.92493"
44	Patch No-1	P-44	572906.657	2469180.163	22°19'36.77890"	81°42'28.57763"
45	Patch No-1	P-45	572915.441	2469164.746	22°19'36.27620"	81°42'28.88213"
46	Patch No-1	P-46	572911.981	2469150.993	22°19'35.82947"	81°42'28.75891"
47	Patch No-1	P-47	572921.904	2469145.508	22°19'35.64957"	81°42'29.10489"
48	Patch No-1	P-48	572924.752	2469134.955	22°19'35.30595"	81°42'29.20270"
49	Patch No-1	P-49	572921.403	2469100.399	22°19'34.18268"	81°42'29.07995"
50	Patch No-1	P-50	572907.399	2469040.237	22°19'32.22830"	81°42'28.58060"
51	Patch No-1	P-51	572891.226	2469050.056	22°19'32.55009"	81°42'28.01687"
52	Patch No-1	P-52	572878.766	2469045.233	22°19'32.39517"	81°42'27.58057"
53	Patch No-1	P-53	572864.817	2469046.413	22°19'32.43567"	81°42'27.09319"
54	Patch No-1	P-54	572868.016	2469021.687	22°19'31.63107"	81°42'27.20095"
55	Patch No-1	P-55	572861.740	2469012.335	22°19'31.32790"	81°42'26.98003"
56	Patch No-1	P-56	572838.036	2469011.340	22°19'31.29914"	81°42'26.15132"
57	Patch No-1	P-57	572838.420	2469001.667	22°19'30.98453"	81°42'26.16315"
58	Patch No-1	P-58	572848.826	2468985.657	22°19'30.46226"	81°42'26.52425"
59	Patch No-1	P-59	572865.044	2468955.007	22°19'29.46303"	81°42'27.08612"
60	Patch No-1	P-60	572879.259	2468949.734	22°19'29.28940"	81°42'27.58215"
61	Patch No-1	P-61	572893.131	2468939.858	22°19'28.96610"	81°42'28.06540"
62	Patch No-1	P-62	572903.622	2468924.411	22°19'28.46214"	81°42'28.42956"
63	Patch No-1	P-63	572922.813	2468879.355	22°19'26.99396"	81°42'29.09299"
64	Patch No-1	P-64	572917.556	2468873.153	22°19'26.79308"	81°42'28.90821"
65	Patch No-1	P-65	572897.518	2468867.826	22°19'26.62291"	81°42'28.20692"
66	Patch No-1	P-66	572855.643	2468828.789	22°19'25.35979"	81°42'26.73683"
67	Patch No-1	P-67	572873.401	2468805.915	22°19'24.61318"	81°42'27.35378"
68	Patch No-1	P-68	572911.500	2468781.545	22°19'23.81486"	81°42'28.68151"
69	Patch No-1	P-69	572928.190	2468802.862	22°19'24.50556"	81°42'29.26838"
70	Patch No-1	P-70	572951.590	2468798.284	22°19'24.35309"	81°42'30.08555"

Sr. No.	Patch No	Point ID	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
71	Patch No-1	P-71	572946.175	2468791.280	22°19'24.12615"	81°42'29.89510"
72	Patch No-1	P-72	572930.690	2468778.458	22°19'23.71154"	81°42'29.35174"
73	Patch No-1	P-73	572932.698	2468758.799	22°19'23.07189"	81°42'29.41872"
74	Patch No-1	P-74	572959.391	2468737.461	22°19'22.37391"	81°42'30.34825"
75	Patch No-1	P-75	572971.718	2468741.269	22°19'22.49584"	81°42'30.77972"
76	Patch No-1	P-76	572976.416	2468756.220	22°19'22.98134"	81°42'30.94641"
77	Patch No-1	P-77	572984.416	2468763.456	22°19'23.21546"	81°42'31.22722"
78	Patch No-1	P-78	572996.830	2468725.762	22°19'21.98773"	81°42'31.65493"
79	Patch No-1	P-79	572988.265	2468714.279	22°19'21.61561"	81°42'31.35368"
80	Patch No-1	P-80	572993.278	2468708.468	22°19'21.42584"	81°42'31.52796"
81	Patch No-1	P-81	572996.098	2468698.484	22°19'21.10073"	81°42'31.62487"
82	Patch No-1	P-82	573004.957	2468690.729	22°19'20.84718"	81°42'31.93325"
83	Patch No-1	P-83	573018.546	2468691.879	22°19'20.88250"	81°42'32.40843"
84	Patch No-1	P-84	573036.357	2468710.076	22°19'21.47157"	81°42'33.03396"
85	Patch No-1	P-85	573043.724	2468708.123	22°19'21.40692"	81°42'33.29115"
86	Patch No-1	P-86	573041.623	2468690.058	22°19'20.81976"	81°42'33.21473"
87	Patch No-1	P-87	573043.340	2468677.960	22°19'20.42607"	81°42'33.27277"
88	Patch No-1	P-88	573054.512	2468662.311	22°19'19.91544"	81°42'33.66070"
89	Patch No-1	P-89	573068.195	2468668.289	22°19'20.10774"	81°42'34.13997"
90	Patch No-1	P-90	573074.073	2468659.665	22°19'19.82639"	81°42'34.34400"
91	Patch No-1	P-91	573070.821	2468653.984	22°19'19.64213"	81°42'34.22941"
92	Patch No-1	P-92	573065.681	2468652.286	22°19'19.58771"	81°42'34.04946"
93	Patch No-1	P-93	573056.537	2468645.244	22°19'19.36011"	81°42'33.72870"
94	Patch No-1	P-94	573010.545	2468631.565	22°19'18.92228"	81°42'32.11887"
95	Patch No-1	P-95	572982.070	2468637.846	22°19'19.13089"	81°42'31.12460"
96	Patch No-1	P-96	572970.250	2468616.013	22°19'18.42268"	81°42'30.70786"
97	Patch No-1	P-97	572953.839	2468605.749	22°19'18.09137"	81°42'30.13254"
98	Patch No-1	P-98	572957.265	2468590.592	22°19'17.59796"	81°42'30.24980"
99	Patch No-1	P-99	572964.962	2468576.619	22°19'17.14237"	81°42'30.51656"
100	Patch No-1	P-100	572985.962	2468567.047	22°19'16.82785"	81°42'31.24900"
101	Patch No-1	P-101	573005.497	2468573.383	22°19'17.03094"	81°42'31.93286"
102	Patch No-1	P-102	573019.135	2468573.180	22°19'17.02223"	81°42'32.40952"
103	Patch No-1	P-103	573033.676	2468568.161	22°19'16.85680"	81°42'32.91695"
104	Patch No-1	P-104	573047.091	2468568.529	22°19'16.86673"	81°42'33.38591"
105	Patch No-1	P-105	573057.563	2468535.579	22°19'15.79356"	81°42'33.74652"
106	Patch No-1	P-106	573052.745	2468536.276	22°19'15.81696"	81°42'33.57822"
107	Patch No-1	P-107	573037.178	2468548.378	22°19'16.21290"	81°42'33.03610"
108	Patch No-1	P-108	573023.683	2468553.539	22°19'16.38282"	81°42'32.56525"
109	Patch No-1	P-109	573002.000	2468544.646	22°19'16.09693"	81°42'31.80590"
110	Patch No-1	P-110	572988.839	2468532.611	22°19'15.70754"	81°42'31.34391"