Quarterly Report on EMF Monitoring

(January - March 2026)

Bhutan InfoComm and Media Authority

Royal Government of Bhutan

March 2026

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1. Background

Electromagnetic Field (EMF) Emissions are the electric and magnetic fields that are produced by radios, microwaves, mobile phones and base stations (mobile towers). Telecommunications transmitters generate electromagnetic fields at radio and microwave frequencies. Transmitters have proliferated with siting of wireless communication networks often co-located among other transmitters and the transmitter used in contact with human bodies. If the EMF exposure is prolonged there may be issues of possible health risks. Such risks must be managed and prevented. Currently International Commission on Non-Ionizing Radiation Protection (ICNIRP) standards and various other standards are adopted on the assessment and compliance of the exposure levels radiated from different electromagnetic spectrum sources according to the permissible levels in order to protect the people from exposure to higher RF radiations. The most sources of exposure include the cellular network using GSM, WCDMA, LTE and others which occupy the VHF, UHF, L and S band frequencies.

The Bhutan InfoComm and Media Authority have always been monitoring and measuring the EMF radiation level of each Telecommunication Base Transceiver station (towers) in the country based on the EMF emission standards. The Authority also certifies the EMF compliance of the mobile towers in the country mainly in urban areas and satellite towns areas.

The EMF emission standard is derived from the EMF radiation threshold developed by ICNIRP and the Authority has standardized the threshold level of EMF radiation exposure based on the regional threshold.

2. Monitoring

The Authority has monitored the EMF from January to March, 2026 in following places;

Sl.No	Name of the Monitored Places	Number of tower Monitored
1	Gasa	2
2	Tsirang	3
3	Dagana	3
4	Nganglam, Pema Gatshel	3
5	Pema Gatshel	1
6	Panbang, Zhemgang	2
7	Zhemgang	3

8	Phuentsholing, Chhukha	5
9	Samdrup Jongkhar	5

The Authority will continue to monitor and measure the mobile towers in the country and will be issued with the certificate of EMF threshold compliance respectively.

3. Objective of the Monitoring

The main objective of the EMF measurement monitoring is:

- To ensure the safe and reliable communication services.
- To test the exposure levels produced by any transmitter or emitter such as telecommunication facilities and mobile telephone base stations for safety purposes and maintain the EMF emission within the standard threshold.
- To ensure that all telecommunication equipment is safe and secure.

4. Details of the Equipment used for EMF Compliance Test

The details of existing EMF monitoring equipment of the Authority are as mentioned below:

Equipment Make/Model:	Narda Safety test solution
Type of the Antenna:	Isotropic Antenna/Type (3-Axis), 420 MHz-6GHz
Spectrum Analyzer:	SRM3006 (9kHz-6GHz)
Calibration details:	Calibrated on 7-03-2024 and valid up to 2 to 3 years

5. Specification of the Equipment/ Instrument

The specification of the above equipment are as mentioned below:

- 3-axis, E-field antenna: 420 MHz to 6 GHz
- Spectrum analyzer SRM 3006: 9 kHz to 6GHz
- A 1.5 meter cable to separate the antenna from the meter
- Tripod to hold the antenna

Figure 1: EMF Monitoring

6. Measurement Parameter

The following quantities are measured while monitoring:

- Electric Field strength E in **V/m**

7. Methodology

The following methodology processes are followed while carrying out the monitoring:

- The measurement is done around 10 meters to 30 meters away from the sectoral antenna's BTS towers facing towards the measurement equipment which is based on the ICNIRP standards measurement.
- The measurement result is taken as the average/Max over a time period of 6 minutes.
- The measurement is done for 2G, 3G, 4G and 5G BTS Tower for both the telecom operators.
- Measurement values will be recorded and compare the measurement values with the reference level as per the international standard ICNIRP.
- Measurement is done through broadband measurement and if the exposure ratio is higher than the exposure ratio limits, the frequency selective measurement is recommended.

8. Reference Standards and Regulation/ICNIRP limits

According to Section 10(1), and 10(2) of the "Standard for the Establishment of Telecommunications Tower"

- 10 (1): *All telecommunication and broadcasting sites shall ensure compliance with the ICNIRP Procedures and Standards for general public exposure and take immediate actions to rectify any non-compliant Sites.*

- 10(2): *Antennas in all sites shall not emit the EMF radiation more than the standards shown in the table below*;

Frequency range	**Electric field-strength (V/m)**		**Equivalent plane wave power-density S_{eq}(W/m^2)**	
	general public	**occupational**	**general public**	**Occupational**
0.1 - 30 Hz	$300/(10^{0.5}*f^{0.7)}$ MHz)	$600/(10^{0.5}*f^{0.7}$MHz)	NA	NA
>30 – 400 MHz	$27.7/10^{0.5}$	$61/10^{0.5}$	0.2	1
>400 - 2000 MHz	$(1.375f^{0.5}$(MHz)$)/10^{0.5}$	$(3f^{0.5}$ (MHz))$/10^{0.5}$	(f/2000)	(f/400)
>2 - 300 GHz	19.289	43.323	1	5

9. Findings and Permissible limits of Electric Field and Exposure Ratio

The EMF measurement of the BTS tower was carried out in **Phuentsholing, Samdrup Jongkhar, Pemagatshel, Zhemgang, Gasa, Tsirang, and Dagana** town Area. It is found that the maximum exposures around all of the base stations are **very low** than exposure limits. The detailed measurement readings , findings, electric field and exposure ratio results are attached below in **Annexure 1** and screenshots of each measurement result are attached in **Annexure 2.**

10. Satellite View of the Measurement Location/Telecom site

The satellite view of the measurement location of each telecom site or transmitter is attached in **Annexure 3.**

Annexure 1 (Measurement Results)

The detailed measurement readings of Electric Field and Exposure Ratio are attached below;

1. Gasa (Bhutan Telecom Limited)

Sl.No	Site Name	Latitude	Longitude	Frequency Band	Field Strength Measurement Value (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1	Gasa Dzong	27°49'44.7'' N	89°43'49.7'' E	LTE 700	0.304	19.29	0.0157	0.5	Below the Limits
				LTE 1800	0.222	18.49	0.0119		
				UMTS 850	0.450	12.87	0.0349		
				5G	0.1961	19.29	0.0101		

2.	Goenteygang	27°49'44.7'' N	89°43'49.7'' E	LTE 700	0.659	19.29	0.0351	**0.5**	**Below the Limits**
				GSM 900	0.158	13.27	0.0119		
				LTE 1800	0.8493	18.64	0.0455		
				5G	0.1875	19.29	0.0097		
				UMTS 850	2.670	12.87	0.2074		

2. Tsirang Bhutan Telecom Limited

Sl. No	Site Name	Latitude	Longitude	Frequency Band	Field Strength MeasurementValue (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1	Mendrelgang, Dupi	26°57'30.1'' N	90°8'37.3'' E	LTE 1800	0.5391	18.64	0.0289	**0.5**	**Below the Limits**
				5G	0.1824	19.29	0.0094		
				GSM 900	0.4188	13.27	0.0315		
				UMTS 850	0.4399	12.87	0.0341		
				LTE 700	0.1069	19.29	0.0054		

3. Tsirang (Tashi InfoComm Limited)

Sl. No	Site Name	Latitude	Longitude	Frequency Band	Field Strength Measurement Value (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1	Mendrelgang, Dupi	26°57'30.1'' N	90°8'37.3'' E	LTE 700	0.1149	19.29	0.0059	0.5	Below the Limits
				LTE 1800	0.7910	18.64	0.0424		
				UMTS 850	0.4084	12.87	0.0317		
				5G	0.1889	19.29	0.0097		
				GSM 900	0.7249	13.27	0.0546		

4. Dagana Bhutan Telecom Limited

Sl. No	Site Name	Latitude	Longitude	Frequency Band	Field Strength Measurement Value (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1	Dagana Dzong	27°4'21.1'' N	89°52'48.4'' E	LTE 700	0.3951	19.29	0.0204	0.5	Below the Limits
				GSM 900	0.3132	13.27	0.0236		
				LTE 1800	0.6931	18.64	0.0371		
				5G	0.931	19.29	0.0482		
2	Dagapela, Telecom Exchange	26°56'04.8'' N	89°57'21.4'' E	LTE 1800	0.6756	18.64	0.0362	0.5	Below the limits
				5G	0.1879	19.29	0.0974		
				GSM 900	0.2489	13.27	0.0187		
				LTE 700	0.9488	19.29	0.0491		

5. Dagana (Tashi InfoComm Limited)

Sl. No	Site Name	Latitude	Longitude	Frequency Band	Field Strength Measurement Value (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1	Dagana Dzong	27°4'21.1" N	89°52'48.4" E	LTE 700	0.1131	19.29	0.0058	0.5	Below the Limits
				LTE 1800	1.614	18.64	0.0865		
				GSM 900	0.4006	13.27	0.0304		
				5G	1.492	19.29	0.0773		
				UMTS 850	0.2830	12.87	0.0219		

6. Pema Gatshel (Bhutan Telecom Limited)

Sl. No	Site Name	Latitude	Longitude	Frequency Band	Field Strength Measurement Value (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1.	Near BHU, Nganglam, Pema Gatshel	26°50'38.5" N	91°14'57.7" E	LTE 700	0.3931	12.14	0.032	**0.5**	**Below the Limits**
				GSM 900	0.1102	13.27	0.008		
				LTE 1800	5.151	18.49	0.278		
				5G	0.1838	19.29	0.009		
2.	Near Forest Range Office, Nganglam, Pema Gatshel	26°50'14.9" N	91°14'54.2" E	LTE 700	0.2518	12.14	0.020	**0.5**	**Below the Limits**
				GSM 900	0.2559	13.27	0.019		
				LTE 1800	0.4719	18.49	0.025		
				5G	0.1874	19.29	0.009		
3.	Nganglam, Pema Gatshel	26°50'18.6" N	91°14'36.1" E	LTE 1800	1.727	18.49	0.093	**0.5**	**Below the Limits**
4.	Near Druk Migyur	27°1'11.8" N	91°23'59.2" E	LTE 700	0.1278	12.14	0.010	**0.5**	**Below the Limits**

	Dechen Dzong, Pema Gatshel			LTE 1800	2.912	18.49	0.157		
				5G	1.705	19.29	0.088		

7. Zhemgang (Bhutan Telecom Limited)

Sl. No	**Site Name**	**Latitude**	**Longitude**	**Frequency Band**	**Field Strength Measurement Value (V/m)**	**BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$**	**Exposure Ratio SQRT (Measured V/Limit Value)^2**	**Exposure Ratio Limits**	**Remark**
1.	Near Police Station, Panbang, Zhemgang	26°50'57.6" N	90°58'06.7" E	LTE 700	0.7227	18.49	0.039	**0.5**	**Below the Limits**
				5G	0.1868	19.29	0.009		
2.	Panbang, Zhemgang	26°50'57.4" N	90°57'40.1" E	LTE 1800	2.206	18.49	0.119	**0.5**	**Below the Limits**
				5G	0.1916	19.29	0.009		
3.	Zhemgang	27°10'11.2" N	90°41'52.5" E	LTE 700	0.1103	12.14	0.009	**0.5**	**Below the Limits**
				LTE 1800	1.355	18.49	0.073		
				5G	0.1904	19.29	0.009		
				LTE 700	0.8664	12.14	0.071		

4.	Below Dzongkhag Court, Zhemgang	27°12'54.9" N	90°39'30.7" E	GSM 900	0.244	13.27	0.018	**0.5**	**Below the Limits**
				LTE 1800	0.7089	18.49	0.038		
				5G	0.5804	19.29	0.030		

8. Zhemgang (Tashi InfoComm Limited)

Sl. No	**Site Name**	**Latitude**	**Longitude**	**Frequency Band**	**Field Strength Measurement Value (V/m)**	**BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$**	**Exposure Ratio SQRT (Measured V/Limit Value)^2**	**Exposure Ratio Limits**	**Remark**
1.	Zhemgang	27°12'54.9" N	90°39'30.7" E	LTE 700	0.1109	11.95	0.009	**0.5**	**Below the Limits**
				GSM 900	0.5003	13.34	0.038		
				UMTS 850	0.5489	12.79	0.043		
				LTE 1800	0.6113	18.64	0.033		
				5G	0.8476	19.29	0.044		

9. Chhukha (Bhutan Telecom Limited)

Sl. No	Site Name	Latitude	Longitude	Frequency Band	Field Strength Measurement Value (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1.	Pipal Dangra, Phuentsholing, Chhukha	26°52'15.0" N	89°23'07.8" E	LTE 700	0.1105	12.14	0.009	**0.5**	**Below the Limits**
				LTE 1800	1.633	18.49	0.088		
				5G	3.274	19.29	0.170		
2.	FCBL Regional Office, Phuentsholing, Chhukha	26°51'58.3" N	89°22'53.2" E	LTE 700	0.9576	12.14	0.079	**0.5**	**Below the Limits**
				GSM 900	0.5699	12.87	0.043		
				UMTS 850	1.009	13.27	0.078		
				LTE 1800	2.24	18.49	0.121		
				5G	0.8278	19.29	0.043		
3.	Phuentsholing, Chhukha	26°51'45.3" N	89°23'04.6" E	LTE 700	0.4982	12.14	0.041	**0.5**	**Below the Limits**
				UMTS 850	0.2027	12.87	0.016		
				LTE 1800	0.2793	18.49	0.015		
				UMTS 1900	0.2225	19.29	0.012		

				5G	0.7459	19.29	0.039		

10. Chhukha (Tashi InfoComm Limited)

Sl. No	Site Name	Latitude	Longitude	Frequency Band	Field Strength Measurement Value (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1.	FCBL Regional Office, Phuentsholing, Chhukha	26°51'57.7" N	89°22'57.6" E	LTE 700	0.1301	11.95	0.011	**0.5**	**Below the Limits**
				UMTS 850	0.07907	12.79	0.006		
				GSM 900	1.183	13.34	0.089		
				LTE 1800	1.331	18.64	0.071		
				TDD 2300	0.0998	19.29	0.005		
				5G	1.041	19.29	0.054		
2.	Phuentsholing, Chhukha	26°51'45.3" N	89°23'04.6" E	LTE 700	0.7507	11.95	0.063	**0.5**	**Below the Limits**
				UMTS 850	0.07628	12.79	0.006		
				GSM 900	0.5382	13.34	0.040		
				LTE 1800	0.233	18.64	0.013		

				5G	1.127	19.29	0.058		

11. Samdrup Jongkhar (Bhutan Telecom Limited)

Sl. No	Site Name	Latitude	Longitude	Frequency Band	Field Strength Measurement Value (V/m)	BICMA Limits V/m ($1.375f^{0.5}$(MHz))/$10^{0.5}$	Exposure Ratio SQRT (Measured V/Limit Value)^2	Exposure Ratio Limits	Remark
1.	Near Dungsamchu old bridge, Samdrup Jongkhar	26°47'44.4" N	91°30'19.0" E	LTE 700	0.4442	12.14	0.037	**0.5**	**Below the Limits**
				GSM 900	0.3528	13.27	0.027		
				LTE 1800	0.9123	18.49	0.049		
				5G	0.3215	19.29	0.017		
2.	BTL Office, Samdrup Jongkhar	26°47'55.4" N	91°30'15.5" E	LTE 700	1.52	12.14	0.125	**0.5**	**Below the Limits**
				UMTS 850	0.07379	12.87	0.006		
				GSM 900	1.18	13.27	0.089		
				LTE 1800	1.899	18.49	0.103		

				UMTS 1900	0.0465	19.29	0.002		
				TDD 2300	0.08046	19.29	0.004		
				5G	0.7711	19.29	0.040		
3.	Near Desuung Quarantine Facility, Samdrup Jongkhar	26°48'29.5" N	91°29'56.1" E	LTE 700	0.5126	12.14	0.042	**0.5**	**Below the Limits**
				LTE 1800	0.7814	18.49	0.042		
				5G	0.8329	19.29	0.043		

12. Samdrup Jongkhar (Tashi InfoComm Limited)

Sl. No	**Site Name**	**Latitude**	**Longitude**	**Frequency Band**	**Field Strength Measurement Value (V/m)**	**BICMA Limits V/m ($(1.375f^{0.5}(MHz))/10^{0.5}$**	**Exposure Ratio SQRT (Measured V/Limit Value)^2**	**Exposure Ratio Limits**	**Remark**
1.	Near SD Eastern Bhutan Ferrous Silicon	26°48'06.2" N	91°30'20.0" E	LTE 700	0.1318	11.95	0.011	**0.5**	**Below the Limits**
				UMTS 850	0.189	12.79	0.015		

	Office Samdrup Jongkhar			GSM 900	0.433	13.34	0.032		
				LTE 1800	0.1596	18.64	0.009		
				5G	3.272	19.29	0.170		
2.	BTL Office, Samdrup Jongkhar	26°48'29.5" N	91°29'56.1" E	LTE 700	0.1208	11.95	0.010	**0.5**	**Below the Limits**
				LTE 1800	1.005	18.64	0.054		
				5G	2.733	19.29	0.142		

Annexure 2 (Screenshot of the result)

The following are the screenshot images of measurement result;

Battery:	GPS: 27°54'18.3" N	Ant: 3AX 0.4-6G	SrvTbl: BTL
05.01.26 14:39:51	89°43'47.0" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Avg
2	UMTS 850	879.000 000 MHz	889.000 000 MHz	450.6 mV/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	304.6 mV/m
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	222.2 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	196.1 mV/m
	Total			619.4 mV/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 300 kHz	Sweep Time: 627 ms Noise Suppr.: Off	Progress: No. of Runs: HOLD AVG: 6 min

Gasa Dzong BTL (Gasa)

Battery:	GPS: 27°49'44.7" N	Ant: 3AX 0.4-6G	SrvTbl: BTL
05.01.26 16:33:49	89°43'49.7" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
2	UMTS 850	879.000 000 MHz	889.000 000 MHz	2.670 V/m
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	849.3 mV/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	659.6 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	187.5 mV/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	158.9 mV/m
	Total			2.719 V/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 300 kHz	Sweep Time: 744 ms Noise Suppr.: Off	Progress: No. of Runs: HOLD AVG: 6 min

Goenteygang BTL(Gasa)

Battery:	GPS: 26°58'07.5" N	Ant: 3AX 0.4-6G	SrvTbl: TICPL
06.01.26 15:36:05	90°7'42.3" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 845.000 000 MHz	1 880.000 000 MHz	941.8 mV/m
6	5G	3 400.000 000 MHz	3 500.000 000 MHz	185.7 mV/m
1	LTE 700	758.000 000 MHz	778.000 000 MHz	110.6 mV/m
	Total			962.2 mV/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 300 kHz	Sweep Time: 514 ms	Progress:
		Noise Suppr.: Off	No. of Runs: HOLD
			AVG: 6 min

Near Station, Rangthaling TICPL (Tsirang)

Battery:	GPS: 26°57'30.1" N	Ant: 3AX 0.4-6G	SrvTbl: BTL
09.01.26 10:45:59	90°8'37.3" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
3	GSM 900	935.000 000 MHz	945.000 000 MHz	418.8 mV/m
2	UMTS 850	879.000 000 MHz	889.000 000 MHz	439.9 mV/m
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	539.1 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	182.4 mV/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	106.9 mV/m
	Total			697.4 mV/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 300 kHz	Sweep Time: 745 ms	Progress:
		Noise Suppr.: Off	No. of Runs: 504
			AVG: 6 min

Dupi, Mendrelgang BTL (Tsirang)

Battery:	GPS: 26°57'30.1" N	Ant: 3AX 0.4-6G	SrvTbl: TICPL
09.01.26 10:54:21	90°8'37.3" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
3	GSM 900	945.000 000 MHz	955.000 000 MHz	724.9 mV/m
4	LTE 1800	1 845.000 000 MHz	1 880.000 000 MHz	791.0 mV/m
2	UMTS 850	869.000 000 MHz	879.000 000 MHz	408.4 mV/m
6	5G	3 400.000 000 MHz	3 500.000 000 MHz	188.9 mV/m
1	LTE 700	758.000 000 MHz	778.000 000 MHz	114.9 mV/m
	Total			1.014 V/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 300 kHz	Sweep Time: 753 ms Noise Suppr.: Off	Progress: No. of Runs: 508 AVG: 6 min

Dupi, Mendrelgang TICPL (Tsirang)

Battery:	GPS: 27°4'21.1" N	Ant: 3AX 0.4-6G	SrvTbl: BTL
07.01.26 12:26:58	89°52'48.4" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	693.1 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	931.0 mV/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	313.2 mV/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	395.1 mV/m
	Total			973.3 mV/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 300 kHz	Sweep Time: 627 ms Noise Suppr.: Off	Progress: No. of Runs: HOLD AVG: 6 min

Daga Dzong BTL (Dagana)

Battery:	GPS: 27°4'21.1" N	Ant: 3AX 0.4-6G	SrvTbl: TICPL
07.01.26 12:36:32	89°52'48.4" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 845.000 000 MHz	1 880.000 000 MHz	1.614 V/m
6	5G	3 400.000 000 MHz	3 500.000 000 MHz	1.492 V/m
3	GSM 900	945.000 000 MHz	955.000 000 MHz	400.6 mV/m
2	UMTS 850	869.000 000 MHz	879.000 000 MHz	283.0 mV/m
1	LTE 700	758.000 000 MHz	778.000 000 MHz	113.1 mV/m
	Total			1.815 V/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 300 kHz	Sweep Time: 753 ms Noise Suppr.: Off	Progress: No. of Runs: HOLD AVG: 6 min

Daga Dzong TICPL (Dagana)

Battery:	GPS: 26°56'04.8" N	Ant: 3AX 0.4-6G	SrvTbl: BTL
07.01.26 15:20:55	89°57'21.4" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
1	LTE 700	783.000 000 MHz	803.000 000 MHz	948.8 mV/m
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	675.6 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	187.9 mV/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	248.9 mV/m
	Total			1.087 V/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 300 kHz	Sweep Time: 627 ms Noise Suppr.: Off	Progress: No. of Runs: HOLD AVG: 6 min

Dagapela Telecom Exchange BTL,(Dagana)

Battery:		GPS:	26°50'38.5" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
29.03.26	09:14:11		91°14'57.7" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	5.151 V/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	393.1 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	183.8 mV/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	110.2 mV/m
	Total			5.156 V/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	635 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Near BHU, Nganglam, Pema Gatshel (BTL)

Battery:		GPS:	26°50'14.9" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
29.03.26	09:33:33		91°14'54.2" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	471.9 mV/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	255.9 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	187.4 mV/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	251.8 mV/m
	Total			561.6 mV/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	653 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Near Forest Range Office, Nganglam, Pema Gatshel (BTL)

Battery:		GPS:	26°50'18.6" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
29.03.26	09:50:27		91°14'36.1" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	1.727 V/m
	Total			1.727 V/m

Isotropic

Safety Evaluation

				Sweep Time:	185 ms	Progress:	
MR:	20 V/m	RBW:	200 kHz	Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Nganglam, Pema Gatshel (BTL)

Battery:		GPS:	27°1'11.8" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
26.03.26	17:17:30		91°23'59.2" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	2.912 V/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	1.705 V/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	127.8 mV/m
	Total			3.149 V/m

Isotropic

Safety Evaluation

				Sweep Time:	509 ms	Progress:	
MR:	20 V/m	RBW:	200 kHz	Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Near Druk Migyur Dechen Dzong, Pema Gatshel (BTL)

Battery:		GPS:	26°50'57.6" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
29.03.26	12:38:27		90°58'06.7" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	722.7 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	186.8 mV/m
	Total			744.0 mV/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	394 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Near Police Station, Panbang, Zhemgang (BTL)

Battery:		GPS:	26°50'57.4" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
29.03.26	12:50:41		90°57'40.1" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Avg
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	1.216 V/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	181.0 mV/m
	Total			1.229 V/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	385 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Panbang, Zhemgang (BTL)

Battery:		GPS:	27°10'11.2" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
29.03.26	16:24:42		90°41'52.5" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	1.355 V/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	190.4 mV/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	110.3 mV/m
	Total			1.370 V/m

Isotropic

Safety Evaluation

				Sweep Time:	509 ms	Progress:	
MR:	20 V/m	RBW:	200 kHz	Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Zhemgang (BTL)

Battery:		GPS:	27°12'54.9" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
29.03.26	17:50:25		90°39'30.7" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
1	LTE 700	783.000 000 MHz	803.000 000 MHz	866.4 mV/m
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	708.9 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	580.4 mV/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	244.0 mV/m
	Total			932.2 mV/m

Isotropic

Safety Evaluation

				Sweep Time:	633 ms	Progress:	
MR:	20 V/m	RBW:	200 kHz	Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Below Dzongkhag Court, Zhemgang *(BTL)*

Battery:		GPS:	27°12'54.9" N	Ant:	3AX 0.4-6G	SrvTbl:	TICPL
29.03.26	17:58:07		90°39'30.7" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
3	GSM 900	945.000 000 MHz	955.000 000 MHz	500.3 mV/m
2	UMTS 850	869.000 000 MHz	879.000 000 MHz	548.9 mV/m
6	5G	3 400.000 000 MHz	3 500.000 000 MHz	847.6 mV/m
4	LTE 1800	1 845.000 000 MHz	1 880.000 000 MHz	611.3 mV/m
1	LTE 700	758.000 000 MHz	778.000 000 MHz	110.9 mV/m
	Total			976.1 mV/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	759 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Zhemgang (TIPL)

Battery:		GPS:	26°52'15.0" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
24.03.26	14:25:31		89°23'07.8" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	3.274 V/m
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	1.633 V/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	110.5 mV/m
	Total			3.358 V/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	522 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Pipal Dangra, Phuentsholing, Chhukha (BTL)

Battery:	GPS: 26°51'58.3" N	Ant: 3AX 0.4-6G	SrvTbl: BTL
24.03.26 14:57:03	89°22'53.2" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	2.240 V/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	957.6 mV/m
2	UMTS 850	879.000 000 MHz	889.000 000 MHz	1.009 V/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	569.9 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	827.8 mV/m
	Total			2.530 V/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 200 kHz	Sweep Time: 756 ms Noise Suppr.: Off	Progress: No. of Runs: HOLD AVG: 6 min

FCBL Regional Office, Phuentsholing, Chhukha (BTL)

Battery:	GPS: 26°51'45.3" N	Ant: 3AX 0.4-6G	SrvTbl: BTL
24.03.26 15:13:10	89°23'04.6" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
1	LTE 700	783.000 000 MHz	803.000 000 MHz	498.2 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	745.9 mV/m
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	279.3 mV/m
2	UMTS 850	879.000 000 MHz	889.000 000 MHz	202.7 mV/m
5	UMTS 1900	2 110.000 000 MHz	2 120.000 000 MHz	222.5 mV/m
	Total			827.8 mV/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 200 kHz	Sweep Time: 758 ms Noise Suppr.: Off	Progress: No. of Runs: 479 AVG: 6 min

Phuentsholing, Chhukha (BTL)

Battery:	GPS: 26°51'57.7" N	Ant: 3AX 0.4-6G	SrvTbl: TICPL
24.03.26 14:43:31	89°22'57.6" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
3	GSM 900	945.000 000 MHz	955.000 000 MHz	1.183 V/m
4	LTE 1800	1 845.000 000 MHz	1 880.000 000 MHz	1.331 V/m
6	5G	3 400.000 000 MHz	3 500.000 000 MHz	1.041 V/m
1	LTE 700	758.000 000 MHz	778.000 000 MHz	130.1 mV/m
5	TDD 2300	2 350.000 000 MHz	2 390.000 000 MHz	99.80 mV/m
2	UMTS 850	869.000 000 MHz	879.000 000 MHz	79.07 mV/m
	Total			1.779 V/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 200 kHz	Sweep Time: 910 ms Noise Suppr.: Off	Progress: No. of Runs: HOLD AVG: 6 min

FCBL Regional Office, Phuentsholing, Chhukha (TIPL)

Battery:	GPS: 26°51'45.3" N	Ant: 3AX 0.4-6G	SrvTbl: TICPL
24.03.26 15:20:25	89°23'04.6" E	Cable: SRM 5 m	Stnd: U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
1	LTE 700	758.000 000 MHz	778.000 000 MHz	0.751 V/m
6	5G	3 400.000 000 MHz	3 500.000 000 MHz	1.127 V/m
3	GSM 900	945.000 000 MHz	955.000 000 MHz	538.2 mV/m
4	LTE 1800	1 845.000 000 MHz	1 880.000 000 MHz	233.0 mV/m
2	UMTS 850	869.000 000 MHz	879.000 000 MHz	76.28 mV/m
	Total			1.336 V/m

Isotropic

Safety Evaluation

MR: 20 V/m	RBW: 200 kHz	Sweep Time: 758 ms Noise Suppr.: Off	Progress: No. of Runs: HOLD AVG: 6 min

Phuentsholing, Chhukha (TIPL)

Battery:		GPS:	26°47'44.4" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
26.03.26	11:04:05		91°30'19.0" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	912.3 mV/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	444.2 mV/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	352.8 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	321.5 mV/m
	Total			985.9 mV/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	633 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Near Dungsamchu old bridge, Samdrup Jongkhar(BTL)

Battery:		GPS:	26°47'55.4" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
26.03.26	11:20:15		91°30'15.5" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	1.899 V/m
3	GSM 900	935.000 000 MHz	945.000 000 MHz	1.180 V/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	1.520 V/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	771.1 mV/m
6	TDD 2300	2 310.000 000 MHz	2 350.000 000 MHz	80.46 mV/m
2	UMTS 850	879.000 000 MHz	889.000 000 MHz	73.79 mV/m
5	UMTS 1900	2 110.000 000 MHz	2 120.000 000 MHz	46.50 mV/m
	Total			2.190 V/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	1.070 s	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

BTL Office, Samdrup Jongkhar (BTL)

Battery:		GPS:	26°48'29.5" N	Ant:	3AX 0.4-6G	SrvTbl:	BTL
26.03.26	11:57:41		91°29'56.1" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
4	LTE 1800	1 815.000 000 MHz	1 845.000 000 MHz	781.4 mV/m
1	LTE 700	783.000 000 MHz	803.000 000 MHz	512.6 mV/m
7	5G	3 500.000 000 MHz	3 600.000 000 MHz	832.9 mV/m
	Total			959.6 mV/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	509 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Near Desuung Quarantine Facility, Samdrup Jongkhar (BTL)

Battery:		GPS:	26°48'06.2" N	Ant:	3AX 0.4-6G	SrvTbl:	TICPL
26.03.26	11:32:59		91°30'20.0" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
6	5G	3 400.000 000 MHz	3 500.000 000 MHz	3.272 V/m
3	GSM 900	945.000 000 MHz	955.000 000 MHz	433.0 mV/m
2	UMTS 850	869.000 000 MHz	879.000 000 MHz	189.0 mV/m
1	LTE 700	758.000 000 MHz	778.000 000 MHz	131.8 mV/m
4	LTE 1800	1 845.000 000 MHz	1 880.000 000 MHz	159.6 mV/m
	Total			3.297 V/m

Isotropic

Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	759 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

Near SD Eastern Bhutan Ferrous Silicon Office Samdrup Jongkhar (TIPL)

Battery:		GPS:	26°48'29.5" N	Ant:	3AX 0.4-6G	SrvTbl:	TICPL
26.03.26	11:50:10		91°29'56.1" E	Cable:	SRM 5 m	Stnd:	U_BICMA

Table View: Detailed

Index	Service	Fmin	Fmax	Max
6	5G	3 400.000 000 MHz	3 500.000 000 MHz	2.733 V/m
4	LTE 1800	1 845.000 000 MHz	1 880.000 000 MHz	1.005 V/m
1	LTE 700	758.000 000 MHz	778.000 000 MHz	120.8 mV/m
	Total			2.803 V/m

Isotropic

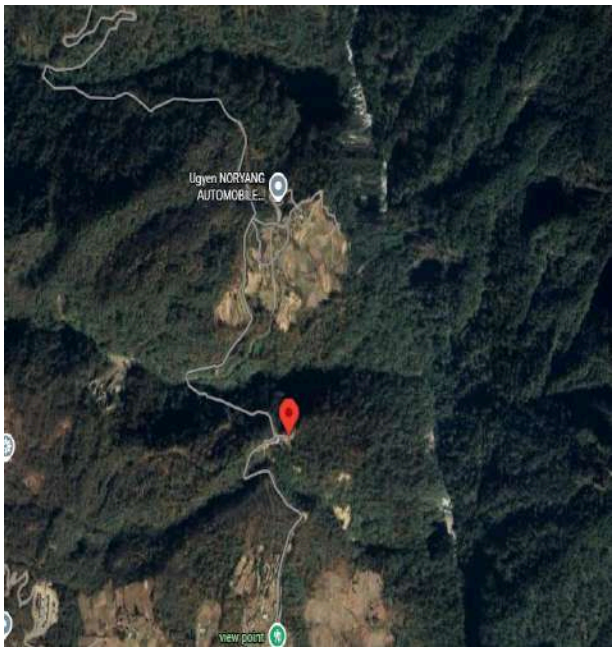
Safety Evaluation

MR:	20 V/m	RBW:	200 kHz	Sweep Time:	509 ms	Progress:	
				Noise Suppr.:	Off	No. of Runs:	HOLD
						AVG:	6 min

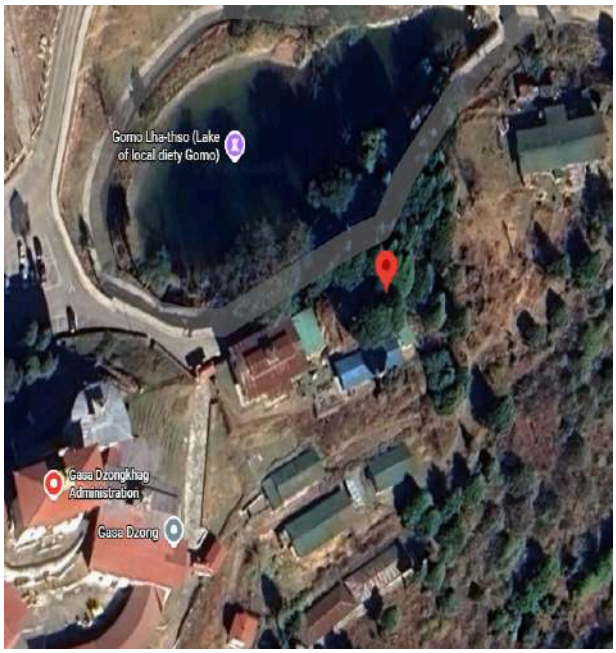
BTL Office, Samdrup Jongkhar (TIPL)

Annexure 3 (Satellite View of Location of Monitored Sites)

The following are the satellite view of the measurement location of the each Telecom site transmitter;



Gasa Dzong



Goenteygang, Gasa

Mendrelgang, Dupi

Near Station, Rangthaling

Dagana Dzong

Dagapela,Telecom Exchange

Near BHU, Nganglam, Pema Gatshel

Near Forest Range Office, Nganglam

Nganglam View point

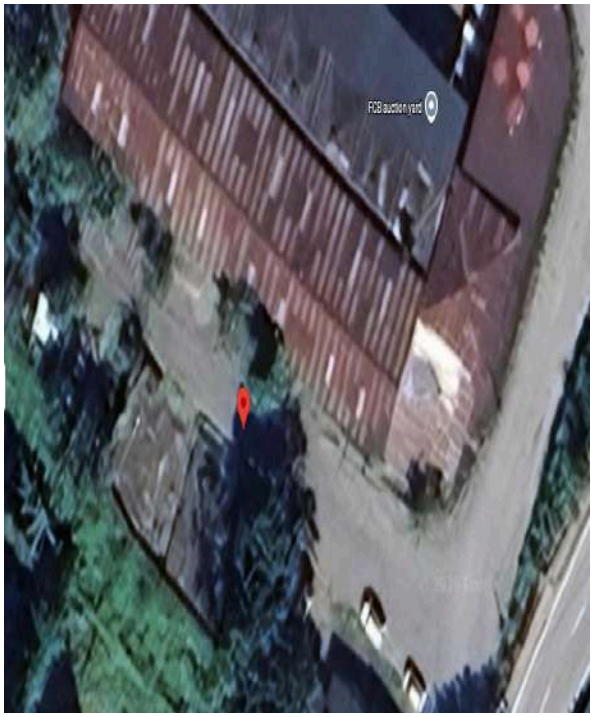
Denchi Pemagatshel

Near Police Station, Panbang, Zhemgang

Panbang, Zhemgang

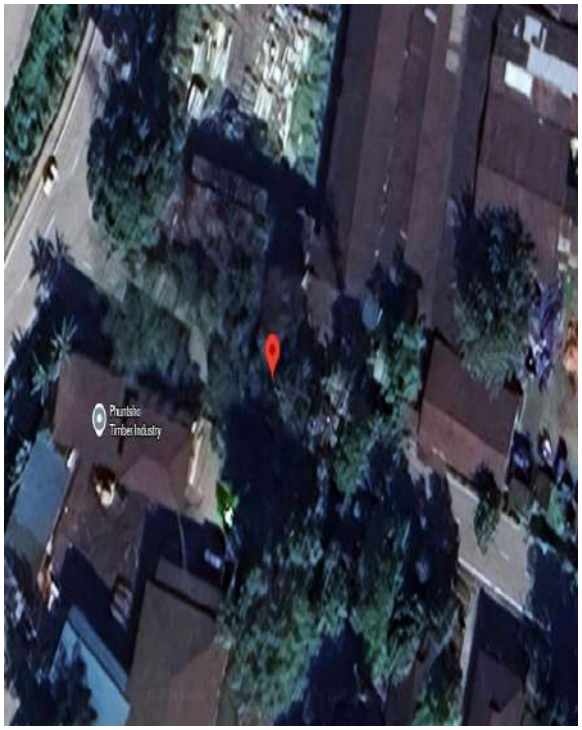
Zhemgang Town

Pipal Dangra, Phuentsholing, Chhukha

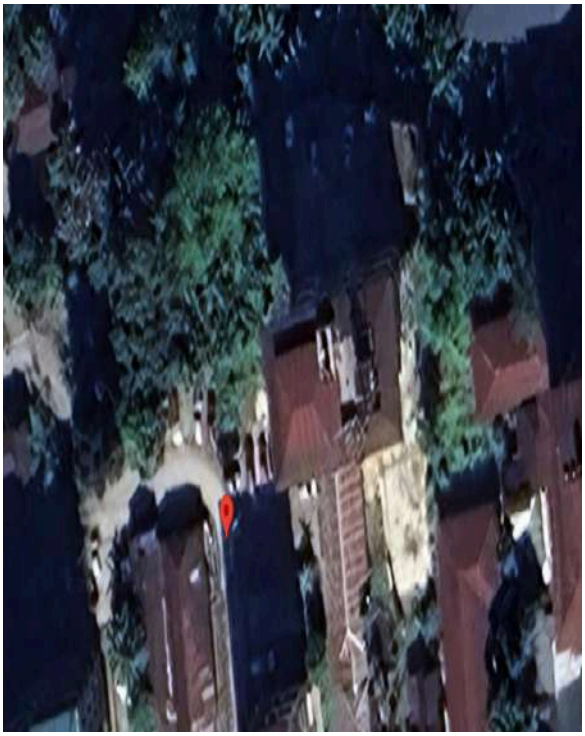


FCBL Regional Office, Phuentsholing

Phuentsholing Town



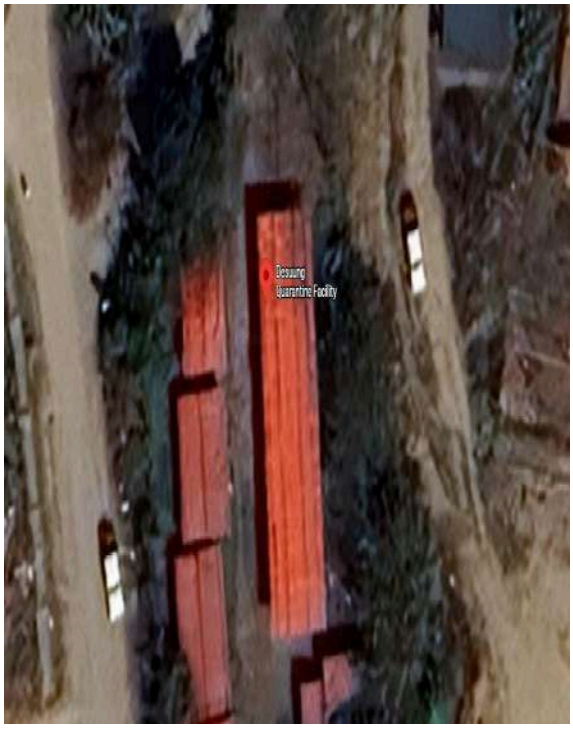
FCBL Regional Office, Phuentsholing



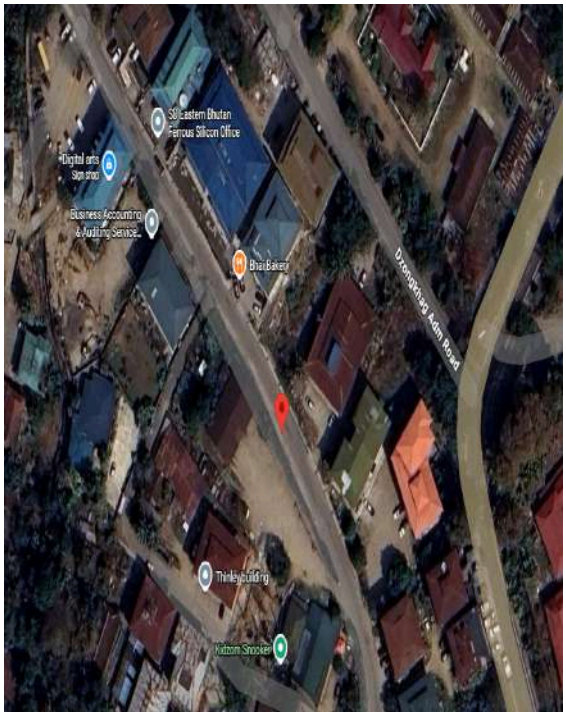
Phuentsholing Town

Near Dungsamchu old bridge, SJ

BTL Office, SJ



Near Desuung Quarantine Facility, SJ



Near SD Eastern Bhutan Ferrous Silicon Office

Near BoD, SJ

Annexure 4 (Image of Monitored BTS)

The following are the images of the each Telecom BTS transmitters;

Gasa Dzong BTL (Gasa)

Goenteygang BTL(Gasa)

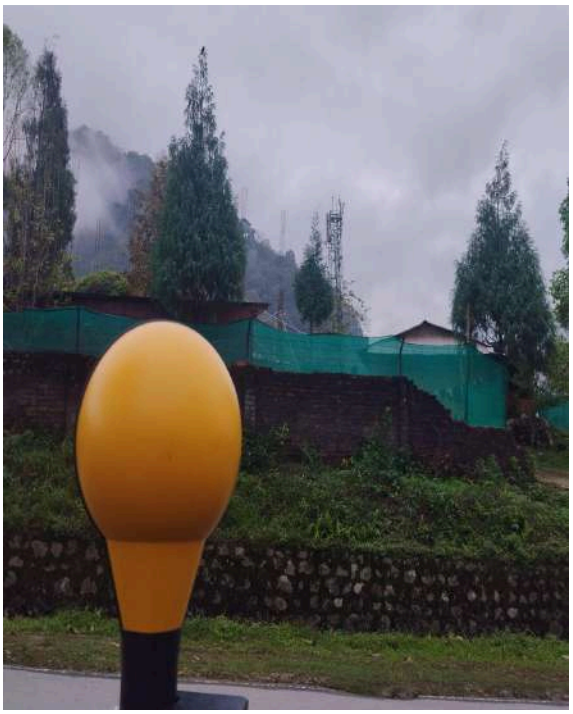
Near Station, Rangthaling TICPL (Tsirang)

Dupi, Mendrelgang BTL (Tsirang)

Dupi, Mendrelgang TICPL (Tsirang)

Daga Dzong BTL/TICPL(Dagana)

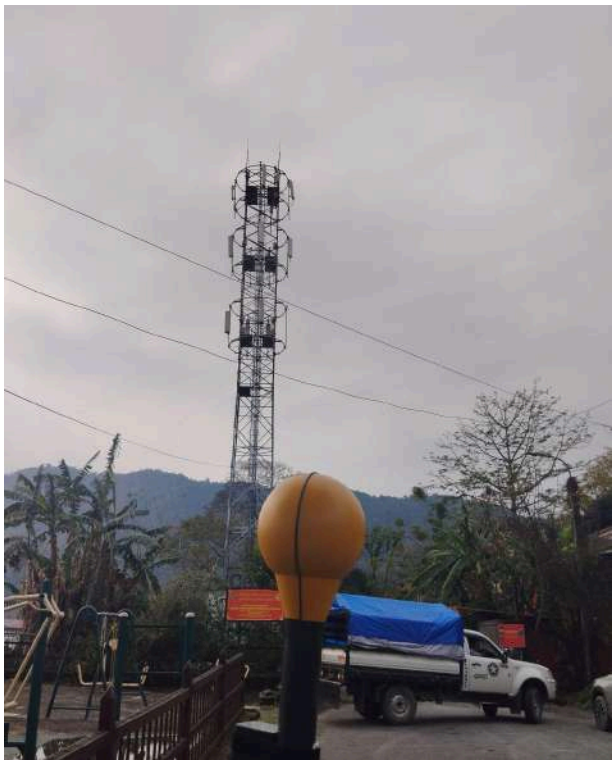
Near BHU, Nganglam, Pema Gatshel BTL



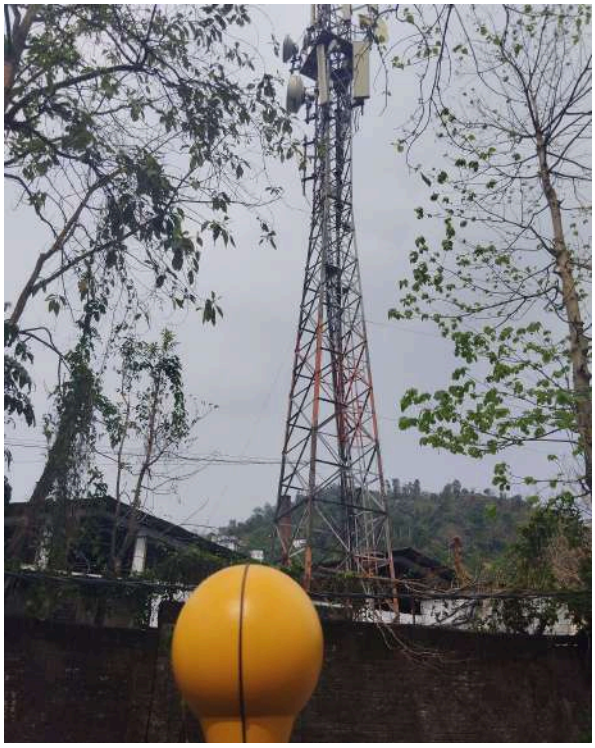
Above school, Nganglam BTL

Denchi Town, Pema Gatshel BTL

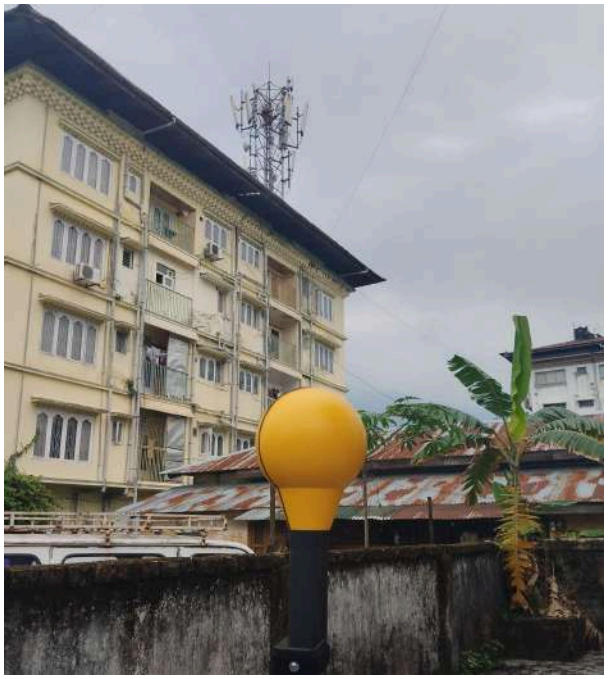
BOD, Phuentsholing(TIPL)



FCBL Regional Office, Phuentsholing BTL



FCBL Regional Office, Phuentsholing TIPL

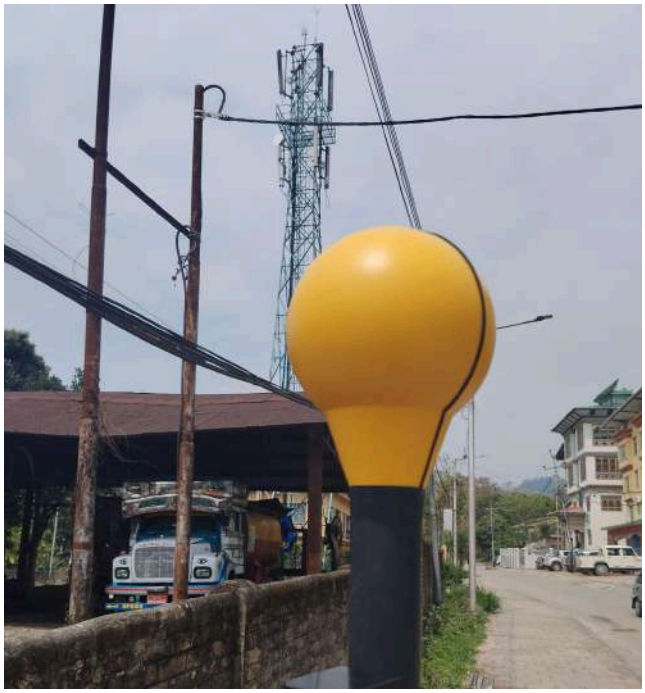


Phuentsholing Town TIPL

Phuentsholing Town BTL

Pipal Dangra, Phuentsholing BTL

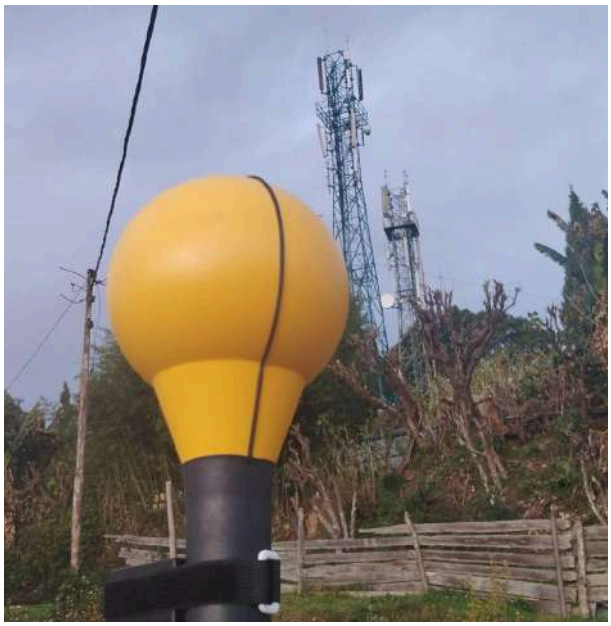
Desuung Quarantine Facility, S/Jongkhar, TIPL



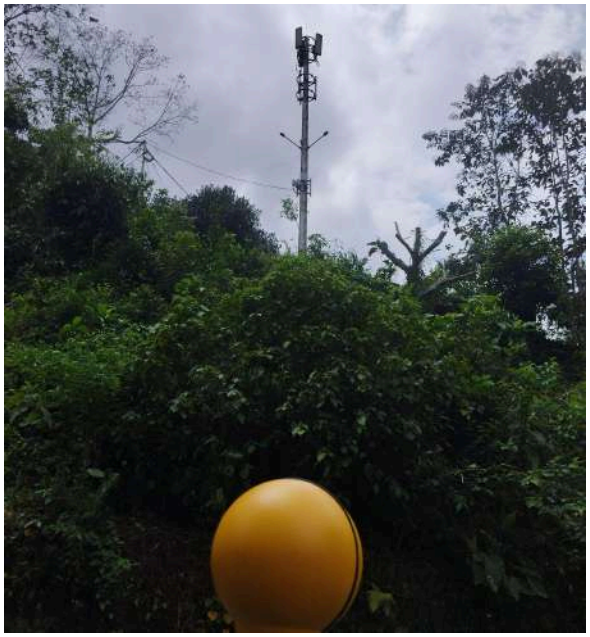
SD Eastern Bhutan Ferrous Silicon, S/Jongkhar, TIPL

BTL office, S/Jongkhar, BTL

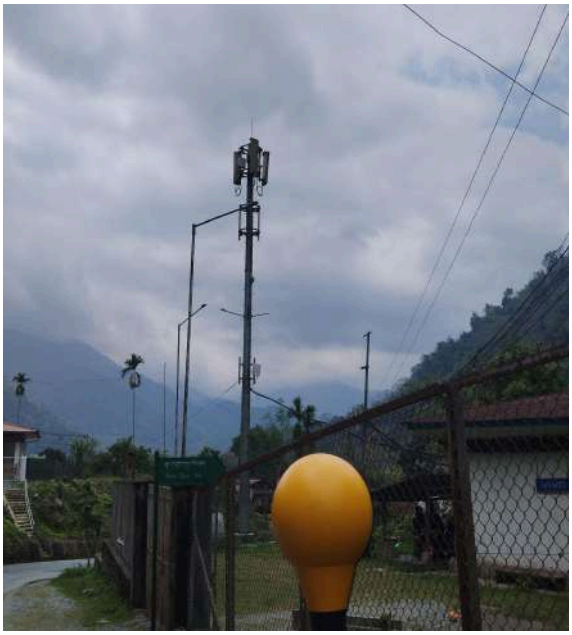
S/Jongkhar BTL



Below Dzongkhag Court Zhemgang TIPL



Near Police Station, Panbang BTL



Panban, Zhemgang BTL

Nanglam, BTL