

Cellular mast emissions survey: Fort Regent



Document details

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Contents page

1	Executive summary	3
2	Site details.....	4
2.1	Site location	4
2.2	Site description	4
2.3	Site photo.....	5
2.4	Test location.....	5
3	Survey results.....	6
3.1	800 MHz band	6
3.2	900MHz band	7
3.3	1800 MHz band	8
3.4	2100MHz band	9
3.5	2600MHz band	10

Lists of figures

Figure 1 – Map of the site area	4
Figure 2 – Location of the peak and where emission levels were measured	5
Figure 3 – Survey area with spot measurement markers.....	5
Figure 4 – 800MHz band spectrum scan.....	6
Figure 5 – 900MHz band spectrum scan.....	7
Figure 6 – 1800MHz spectrum scan.....	8
Figure 7 – 2100MHz band spectrum scan.....	9
Figure 8 – 2600MHz band spectrum scan.....	10

List of tables

Table 1 – Cumulative exposure quotient.....	3
Table 2 – 800MHz band exposure quotient at Fort Regent.....	6
Table 3 – 900MHz band exposure quotient at Fort Regent.....	7
Table 4 – 1800MHz band exposure quotient at Fort Regent.....	8
Table 5 – 2100MHz band exposure quotient at Fort Regent.....	9
Table 6 – 2600MHz band exposure quotient at Fort Regent.....	10

1 Executive summary

The Jersey Competition and Regulatory Authority or JCRA regularly monitors emission levels from the cellular masts in Jersey¹ to ensure the mobile network operators who operate their services from those masts comply with their license obligations in terms of power levels and that the levels from the sites meet the internationally recognised standards and guidelines regarding health and safety limits for the public.

In 2017, JCRA commissioned EM emission level surveys at all the sites within the island. The surveys were repeated in each subsequent year for all new sites and sites where major changes were made by the operators in the previous year. This report presents the results of the survey conducted at the Fort Regent site in 2021.

The Fort Regent site was used by two operators at the time of the survey: Sure and JT. Surveys were conducted at all cellular frequency bands (800, 900, 1800, 2100 and 2600MHz) for all mobile cellular technologies (GSM, 3G and 4G) and for all three cellular operators as a routine procedure. Even though the reported levels are expected to be predominantly emitted from this site, the test equipment does not discriminate between nearby sites which means that the levels are cumulated over all site emissions detected by the test instrument.

The survey established that the emission levels around the site were very low and well below the safety limits for the public advised by internationally recognised standards.

The values shown hereafter are the maximum levels recorded around the site following a peak search. The levels were found to be lower at all the other locations round this site. The recorded values are true at the time of testing and can go up or down depending on the level of user activity on the site.

The total Exposure Quotient (EQ) for the site recorded across all detected cellular frequency bands is given at the bottom of the summary table below. A total EQ close to 1 (one) for the site would mean that emission levels approach the safety limit advised by ICNIRP in their guidelines.

Table 1 – Cumulative exposure quotient

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Fort Regent	800	0.9778	Sure	40	0.004801482	1/ 208
	900	3.432	JT	12	0.019803109	1/ 50
	1800	1.956	Sure	30	0.015077349	1/ 66
	2100	0.3237	Sure	188	0.000180726	1/ 5533
	2600	0.5014	Sure	122	0.000673784	1/ 1484
Total Site EQ					0.04053645	1/ 25

The results show that the total EQ was measured at 1/25 and therefore remains well below the ICNIRP guidelines.

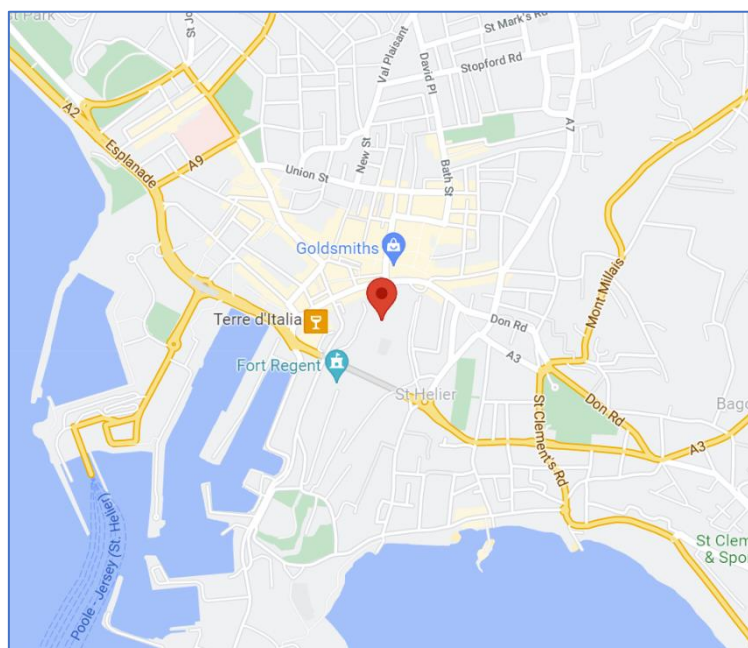
The graphs which follow show the activity on all the frequency bands surveyed. The plots are colour-coded for easy identification of the three main operators: Airtel in red, Sure in dark blue, and Jersey Telecom in light blue. The graphs are also supported by the equivalent statistical figures derived from the measured levels at the site for added clarity.

¹ Prior to 1 July 2020, the JCRA and the Guernsey Competition & Regulatory Authority coordinated their activities in the Channel Islands as the Channel Islands Competition and Regulatory Authorities (CICRA). Earlier reports may refer to CICRA rather than JCRA.

2 Site details

2.1 Site location

Figure 1 – Map of the site area



Site name:	Fort Regent
Site address:	Fort Regent Road, St Helier, Jersey
Site latitude:	49.182592
Site longitude:	-2.105053

2.2 Site description

Operators:	Sure, JT
Antenna types:	Directional
Approximate height:	Various heights up to 8m
Site type:	Mixed
Description:	The antennas at Fort Regent are located in a restricted access compound on various structures (poles, lattice masts) and are positioned at the top of the structures. Public access to the antenna is not possible without a climbing aid.

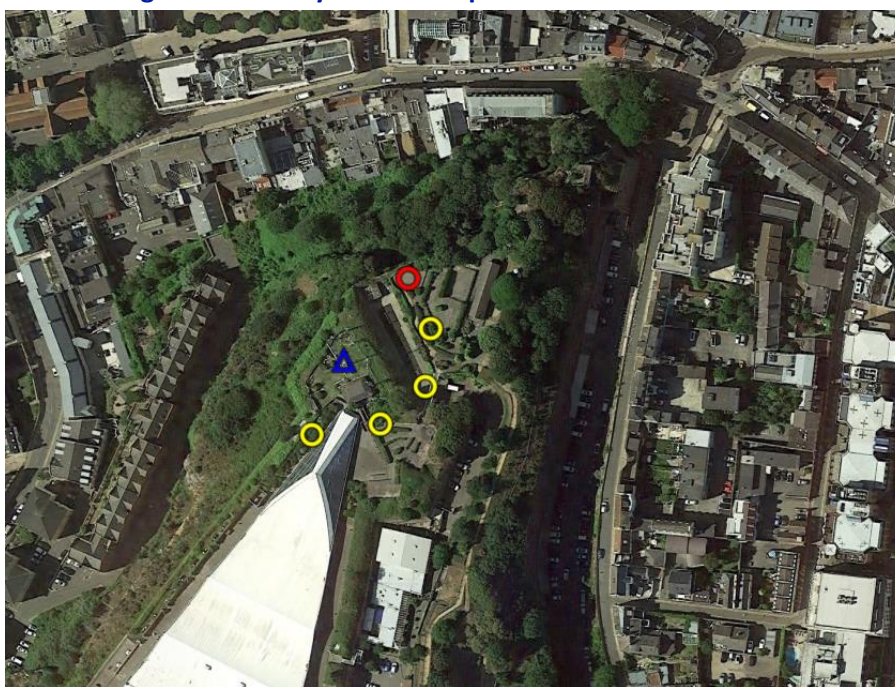
2.3 Site photo

Figure 2 – Location of the peak and where emission levels were measured



2.4 Test location

Figure 3 – Survey area with spot measurement markers



The blue triangle is the site location, the yellow circles are intermediate locations measured at during the peak search and the red circle is the spot where the highest spot search reading was obtained and where the detailed survey was carried out.

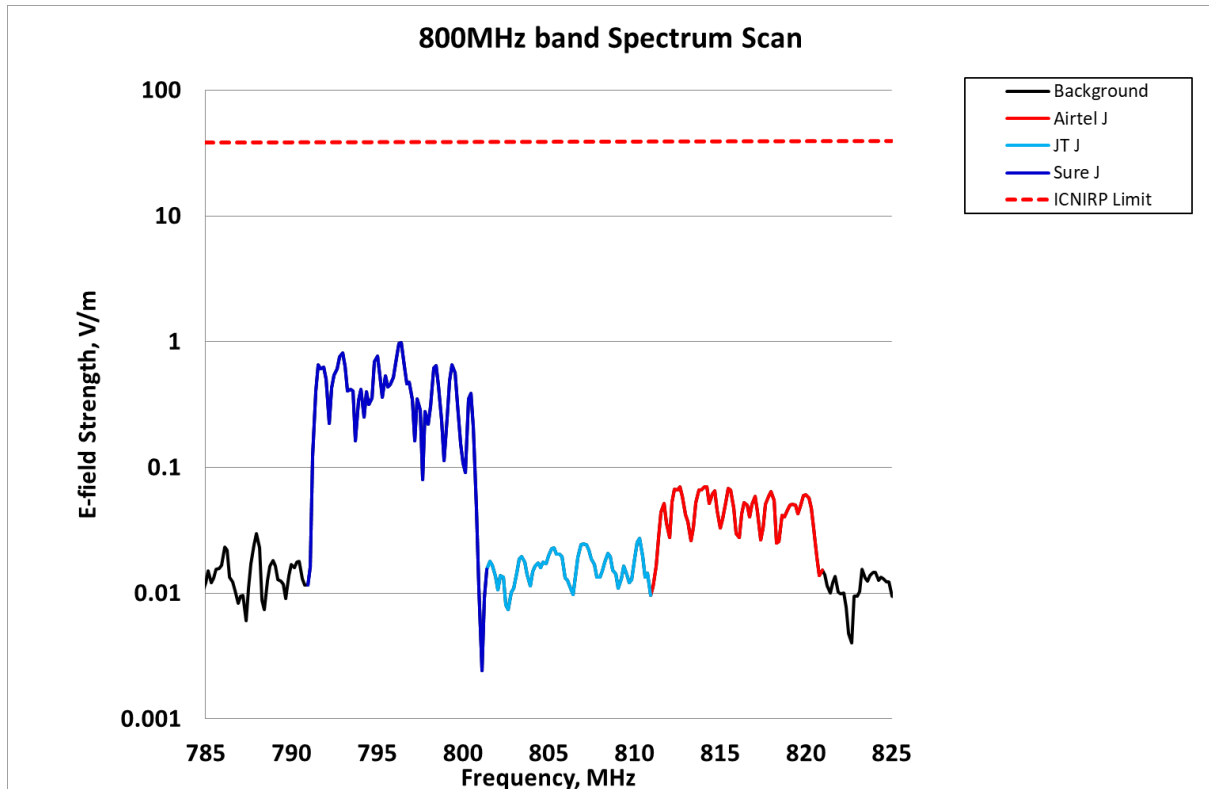
As part of the peak search procedure, spot measurements were taken at locations around the antennas as shown on the above sketch. The reported spectrum scans were taken at the peak location (shown in red above) where the highest readings were recorded. The spectrum readings reported further down this report were recorded over a period of six minutes as advised by ICNIRP.

3 Survey results

3.1 800MHz band

The graph for the 800MHz activity is shown below with the E-field strength levels measured at the site plotted on a logarithmic scale.

Figure 4 – 800MHz band spectrum scan



The red line on the scan represents the Airtel activity, the light blue is JT and the dark blue is Sure. ICNIRP's reference level for the general public is also shown as the straight dashed line at the top of the graph. For clarity, each step on the vertical axis represents a 10-fold increase. The same scaling and colour scheme will be used throughout this report.

No field level recorded across the band was higher than 0.9778 V/m (Sure), which is 40 times smaller than the ICNIRP guideline level in this frequency band.

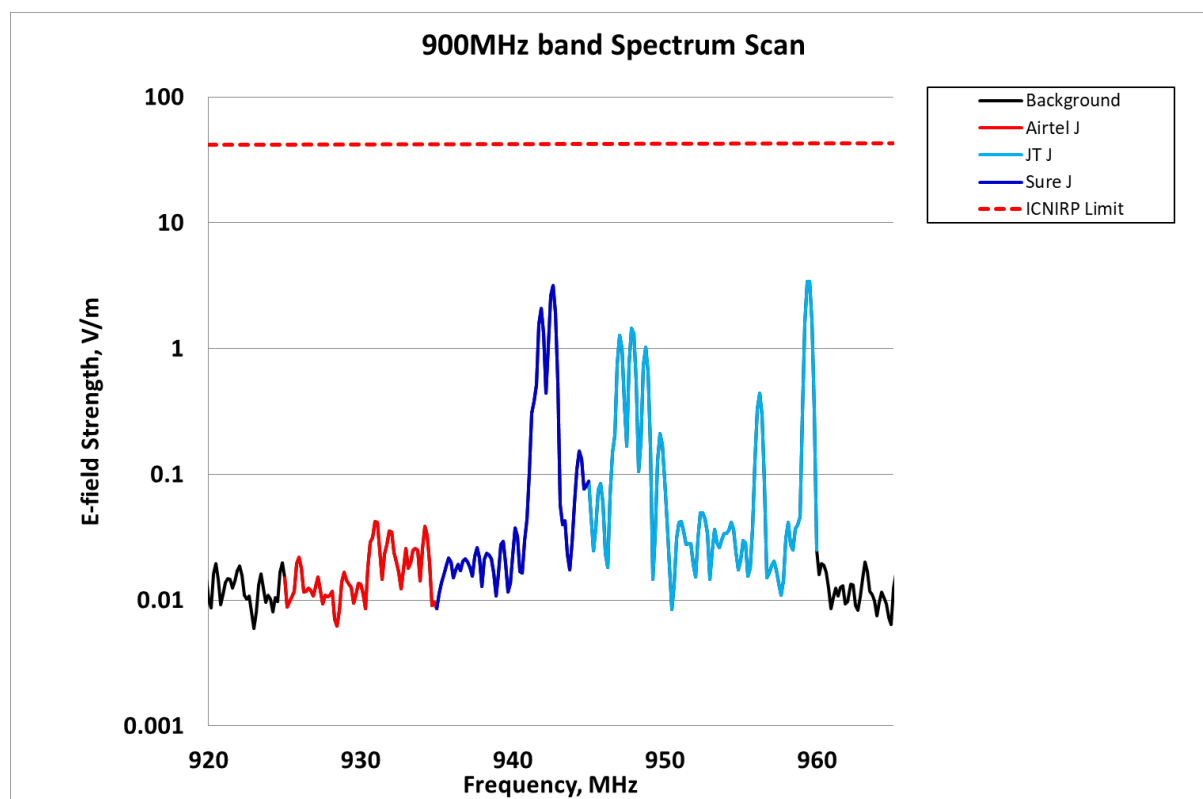
Table 2 – 800MHz band exposure quotient at Fort Regent

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Fort Regent	Airtel	800	0.06989	556	4.85794E-05	1/ 20585
	JT		0.02725	1427	5.76855E-06	1/ 173354
	Sure		0.9778	40	0.004747134	1/ 211
total band EQ					0.004801482	1/ 208

3.2 900MHz band

The graph for the 900MHz activity is shown below.

Figure 5 – 900MHz band spectrum scan



No field level recorded across the band was higher than 3.432 V/m (JT), which is 12 times smaller than the ICNIRP guideline level.

The EQ results for the 900MHz band are shown below.

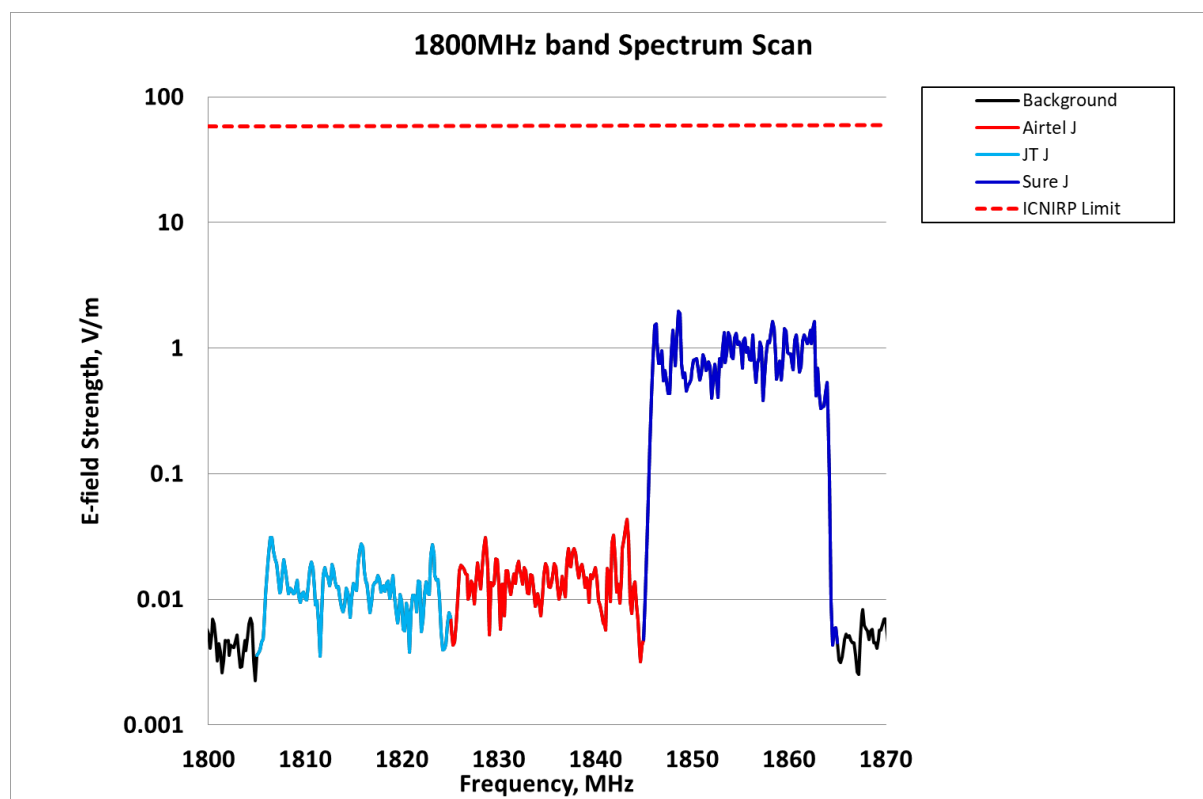
Table 3 – 900MHz band exposure quotient at Fort Regent

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Fort Regent	Airtel	900	0.04186	985	7.06312E-06	1/ 141580
	JT		3.432	12	0.010996044	1/ 91
	Sure		3.175	13	0.008800002	1/ 114
total band EQ					0.019803109	1/ 50

3.3 1800MHz band

The graph for the 1800MHz activity around the site is shown below.

Figure 6 – 1800MHz spectrum scan



No field level recorded across the band was higher than 1.956 V/m (Sure), which is 30 times smaller than the ICNIRP guideline level.

The EQ results for the 1800MHz band are shown below.

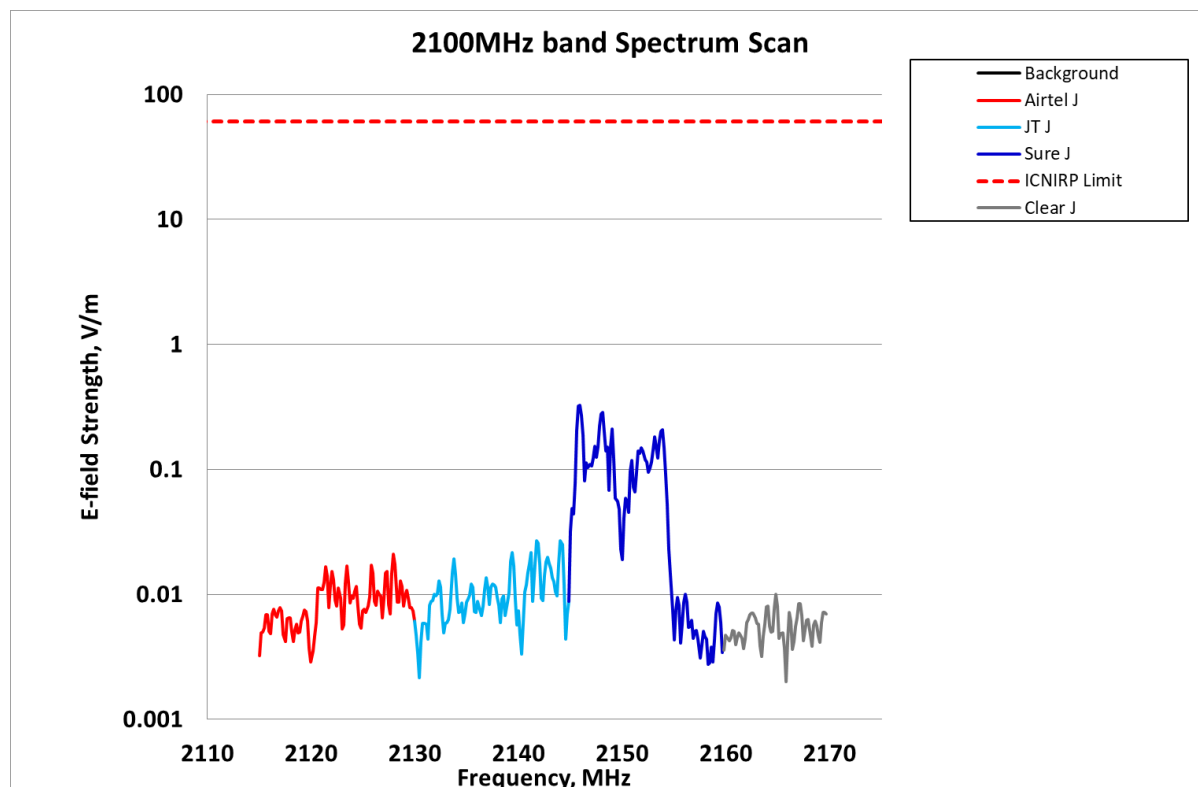
Table 4 – 1800MHz band exposure quotient at Fort Regent

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Fort Regent	Airtel	1800	0.04321	1350	4.90418E-06	1/ 203908
	JT		0.03114	1873	3.49927E-06	1/ 285774
	Sure		1.956	30	0.015068946	1/ 66
total band EQ					0.015077349	1/ 66

3.4 2100MHz band

The graph for the 2100MHz band activity around the site is shown below.

Figure 7 – 2100MHz band spectrum scan



No field level recorded across the band was higher than 0.3237 V/m (Sure), which is 188 times smaller than the ICNIRP guideline level.

The EQ results for the 2100MHz band are shown below.

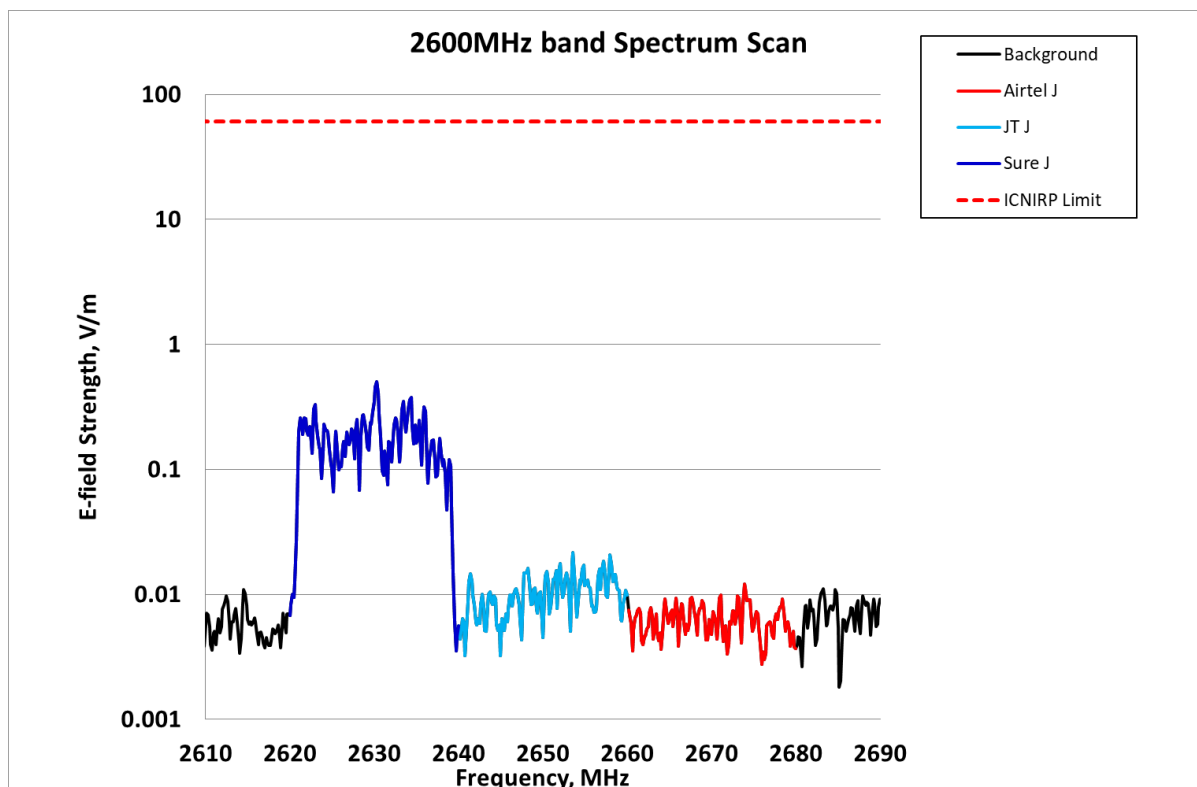
Table 5 – 2100MHz band exposure quotient at Fort Regent

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Fort Regent	Airtel	2100	0.02091	2917	1.15269E-06	1/ 867537
	Clear		0.009972	6117	2.82002E-07	1/ 3546075
	JT		0.02695	2263	1.84809E-06	1/ 541098
	Sure		0.3237	188	0.000177443	1/ 5636
total band EQ					0.000180726	1/ 5533

3.5 2600MHz band

The graph for the 2600MHz band activity around the site is shown below.

Figure 8 – 2600MHz band spectrum scan



No field level recorded across the band was higher than 0.5014 V/m (Sure), which is 122 times smaller than the ICNIRP guideline level.

The EQ results for the 2600MHz band are shown below.

Table 6 – 2600MHz band exposure quotient at Fort Regent

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Fort Regent	Airtel	2600	0.01211	5037	1.46288E-06	1/ 683584
	JT		0.02173	2807	2.05591E-06	1/ 486402
	Sure		0.5014	122	0.000670265	1/ 1492
total band EQ					0.000673784	1/ 1484

END