Cellular Mast Emissions Survey: South Exchange (Jersey)

DOCUMENT DETAILS

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Executive Summary

CICRA regularly monitors radiowave emissions from the cellular masts in the Bailiwicks of Guernsey and Jersey 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 emissions from the sites comply with internationally recognised standards and guidelines regarding Health & Safety limits for the public.

In 2017, CICRA commissioned iWireless Solutions to conduct the emission surveys at all sites within the two Bailiwicks. This report is for the South Exchange site located in Jersey.

The South Exchange site was used by one operator at the time of the survey: JT J. Surveys were however 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.

The survey established that the emissions around this 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 that were recorded around the site following a peak search. In most other locations, the levels were lower. The recorded values are only true at the time of testing and can go up or down depending on the level of user activity on the cell.

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

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
South Exchange	800	0.01335	Airtel J	2913	2.22693E-06	1/ 449049
	900	0.9331	JT J	44	0.000733653	1/ 1363
	1800	0.1388	JT J	420	0.000107692	1/ 9286
	2100	0.2035	JT J	300	0.000256928	1/ 3892
	2600	0.002636	JT J	23141	1.09233E-07	1/ 9154744
				Total Site EQ	0.001100609	1/ 909

Table 1 - Cumulative Exposure Quotient

The results show that the cumulative EQ was measured at 1/909 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 J in red, Sure J in dark blue, and Jersey Telecom J 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. Site Details

1.1 Site Location

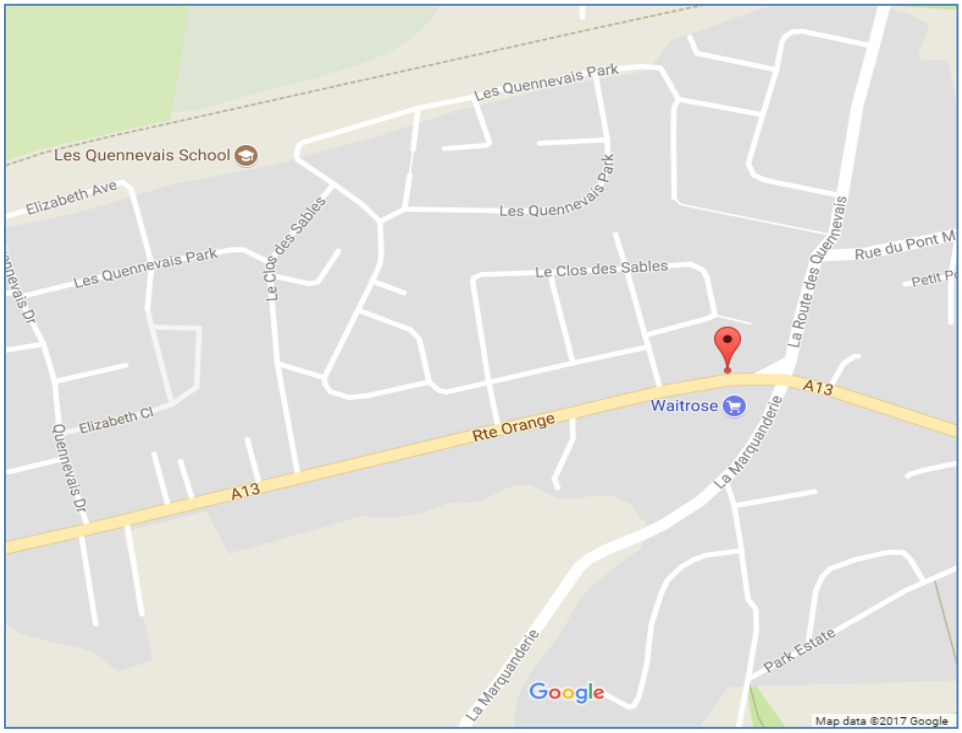

Figure 1 - Map of the Site Area

Site name	South Exchange
Site address	South Exchange, Route Orange
Site Latitude	49.1906
Site Longitude	-2.20106

1.2 Site Description

Operators	JT J
Antenna types	Omni directional
Approximate height	10m
Site type	Rooftop
Description	The antennas at South Exchange are located on the roof of the main building, out of reach of the public

1.3 Site Photo

Figure 2 – Peak Measurement Location

1.4 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 site, 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 6 minutes as advised by ICNIRP.

2. Survey Results

2.1 800 MHz Band

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

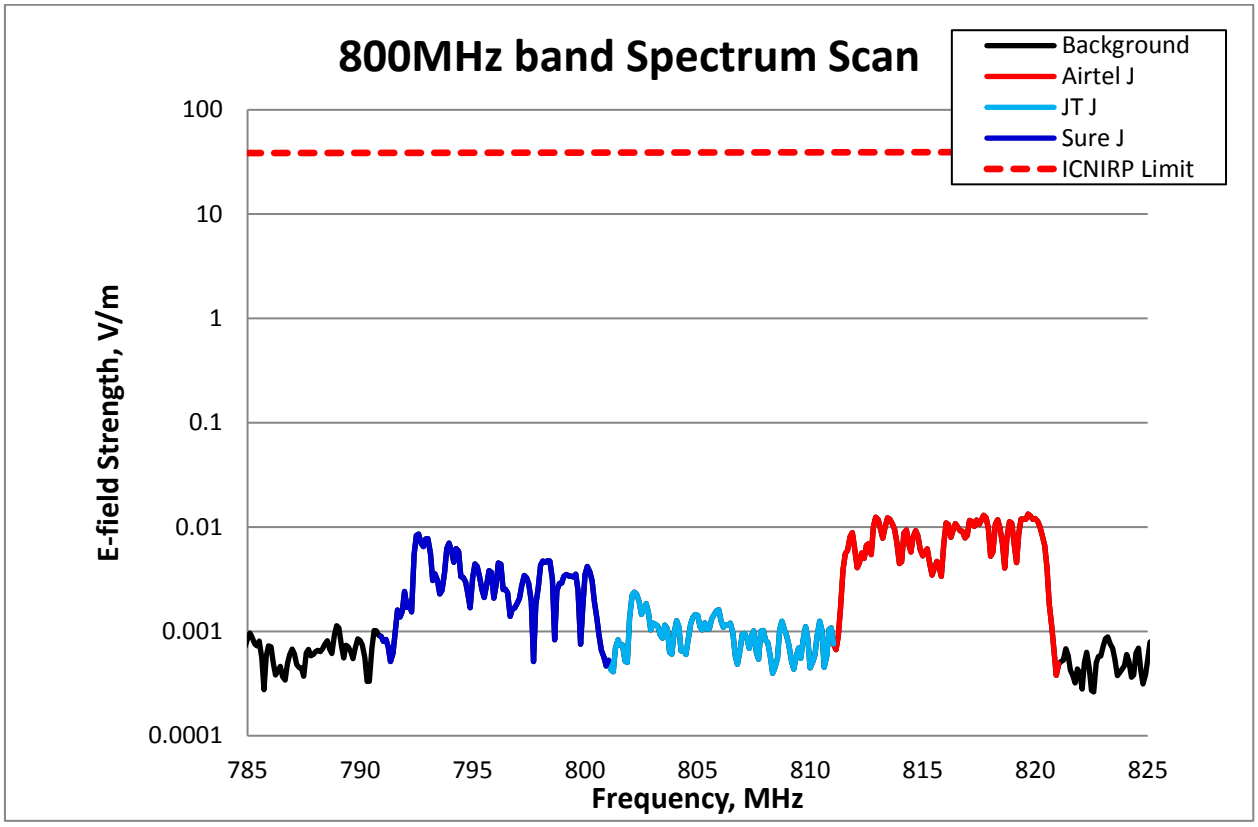

Figure 4 - 800MHz band Spectrum Scan

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 activity was recorded in the 800MHz as no operator appears to transmit in this band at this site.

The Exposure Quotient results for the 800MHz band are shown below:

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
South Exchange	Airtel J	800	0.01335	2913	1.85432E-06	1/ 539281
	JT J		0.002376	16368	2.92257E-08	1/ 34216442
	Sure J		0.00859	4527	3.43383E-07	1/ 2912202
				total band EQ	2.22693E-06	1/ 449049

Table 2– 800MHz band Exposure Quotient at South Exchange

2.2 900 MHz Band

The graph for the 900 MHz activity is shown below:

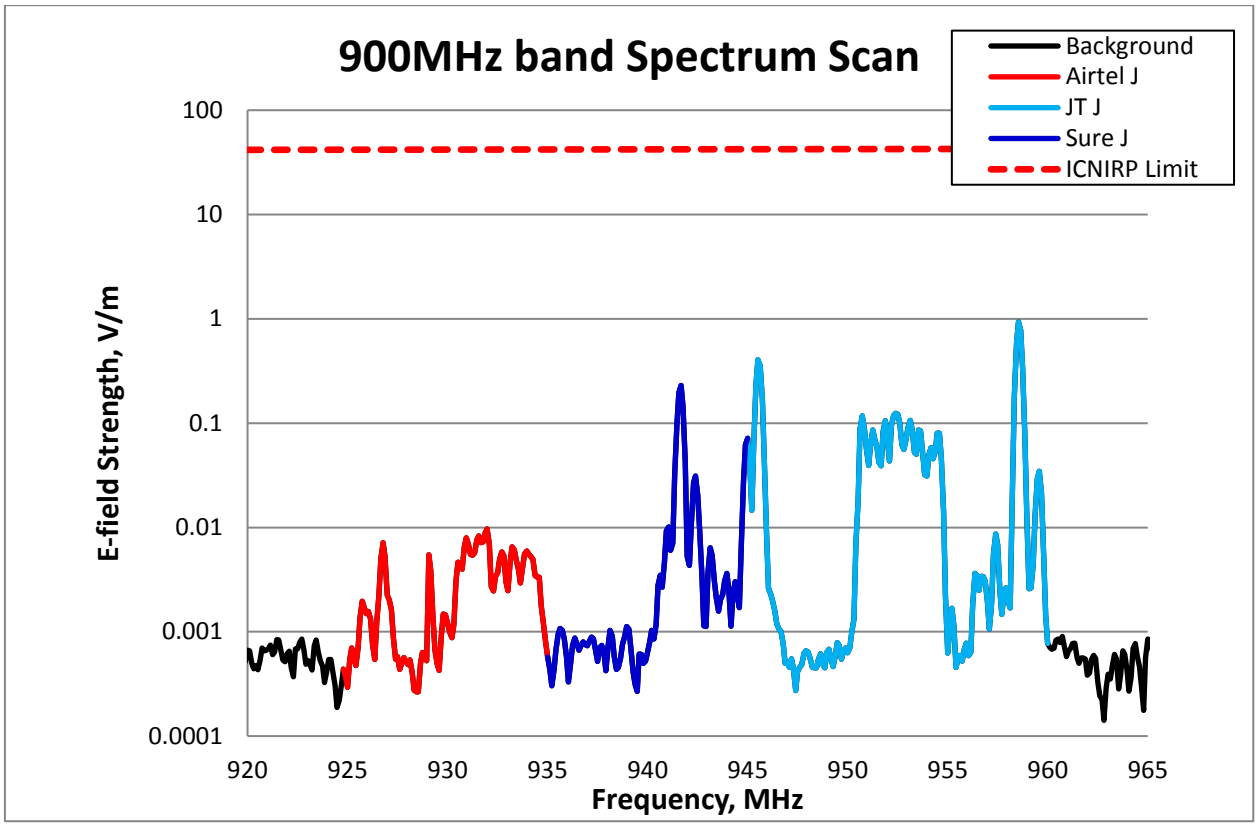

Figure 5 - 900MHz band Spectrum Scan

No field level recorded across the band was higher than 0.9331 V/m (JTJ), which is 44 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 900MHz band are shown below:

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
South Exchange	Airtel J	900	0.00967	4266	3.92331E-07	1/ 2548868
	JT J		0.9331	44	0.000696608	1/ 1436
	Sure J		0.2299	179	3.6652E-05	1/ 27284
				total band EQ	0.000733653	1/ 1363

Table 3– 900MHz band Exposure Quotient at South Exchange

2.3 1800 MHz Band

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

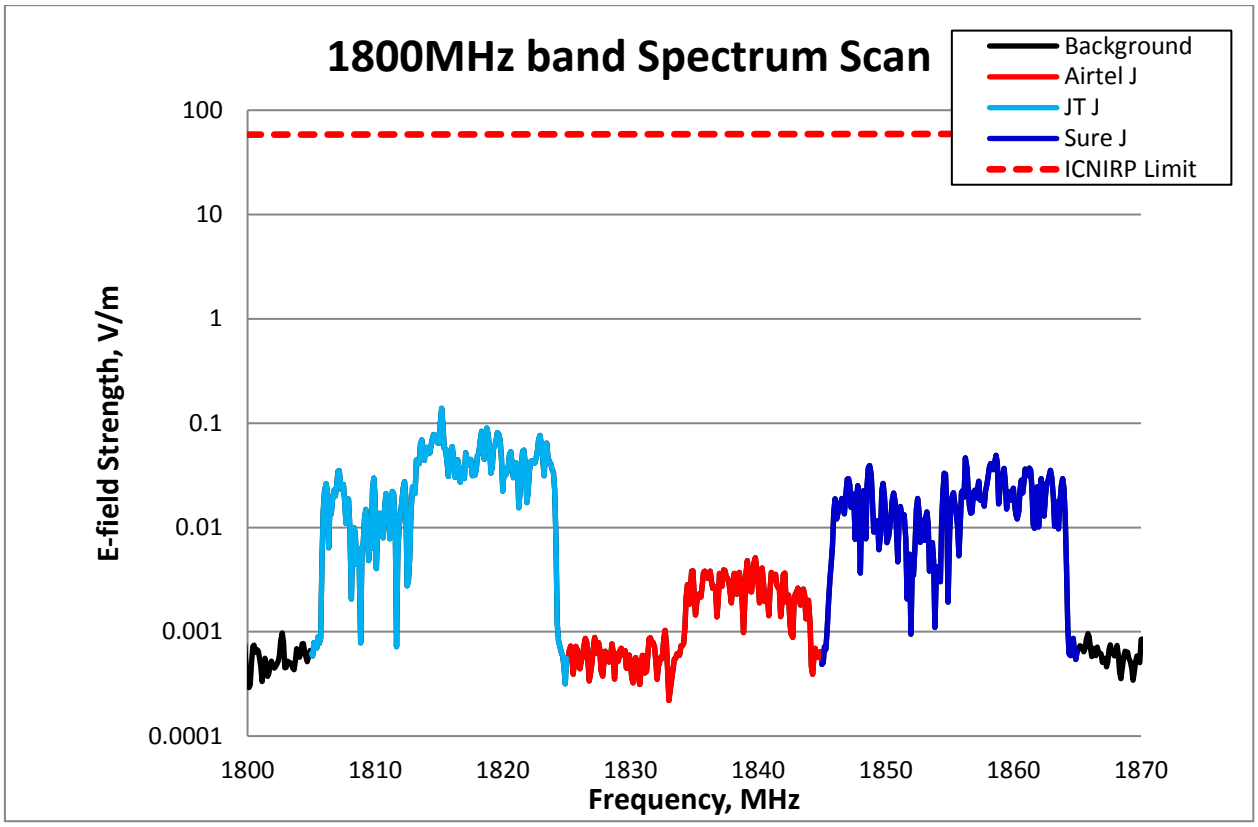

Figure 6 - 1800MHz Spectrum Scan

No field level recorded across the band was higher than 0.1388 V/m (JT J), which is 420 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 1800MHz band are shown below:

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
South Exchange	Airtel J	1800	0.005122	11389	2.13644E-07	1/ 4680689
	JT J		0.1388	420	8.64516E-05	1/ 11567
	Sure J		0.04917	1186	2.10265E-05	1/ 47559
				total band EQ	0.000107692	1/ 9286

Table 4 – 1800MHz band Exposure Quotient at South Exchange

2.4 2100MHz Band

The graph for the UMTS activity around the site is shown below:

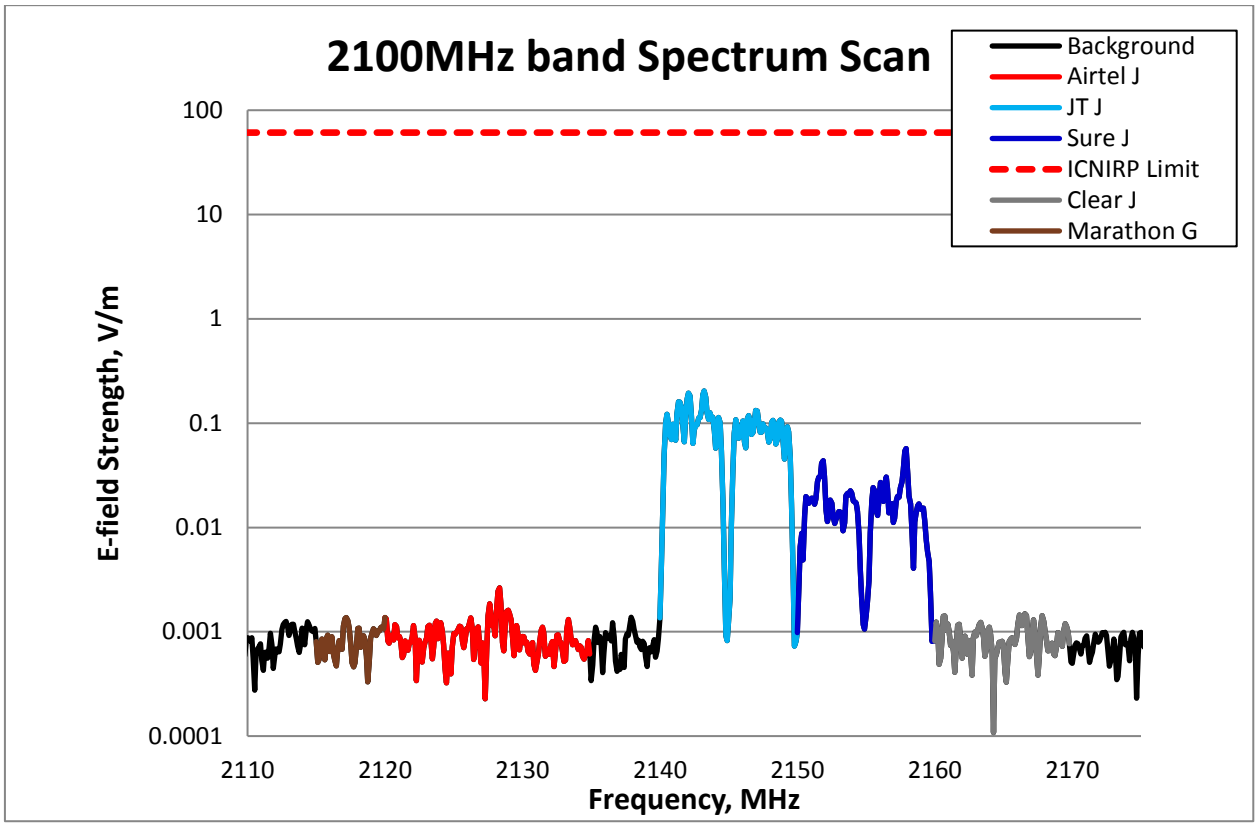

Figure 7 – 2100MHz band Spectrum Scan

No field level recorded across the band was higher than 0.2035 V/m (JT J), which is 300 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 2100MHz band are shown below:

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
South Exchange	Airtel J	2100	0.002635	23150	3.55008E-08	1/ 28168371
	Clear J		0.001486	41050	2.14602E-08	1/ 46597795
	JT J		0.2035	300	0.000247052	1/ 4048
	Marathon J		0.001372	44461	9.96903E-09	1/ 100310704
	Sure J		0.05711	1068	9.80924E-06	1/ 101945
				total band EQ	0.000256928	1/ 3892

Table 5 – 2100MHz band Exposure Quotient at South Exchange

2.5 2600MHz band

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

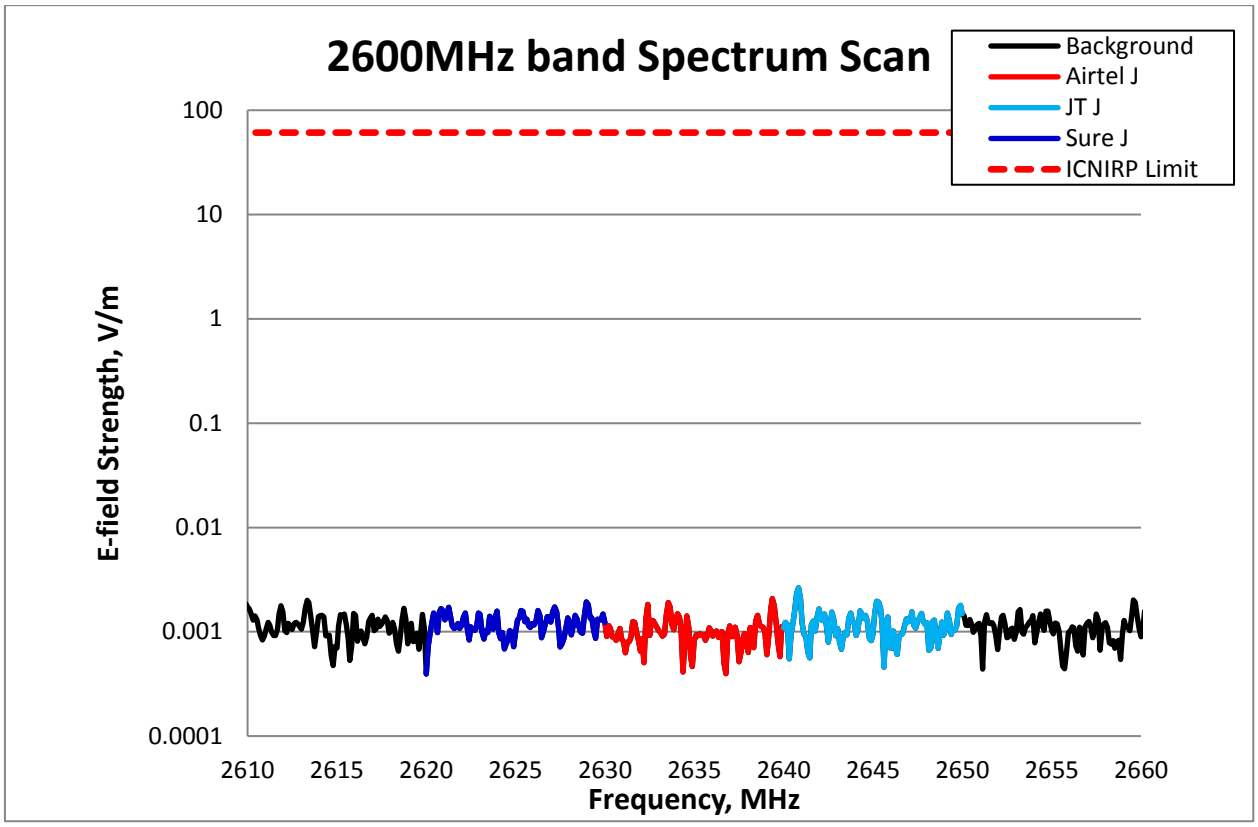

Figure 8 – 2600MHz band Spectrum Scan

No activity was recorded in the 2600MHz as no operator appears to transmit in this band at this site.

The Exposure Quotient results for the 2600MH band are shown below:

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
South Exchange	Airtel J	2600	0.002082	29299	2.91245E-08	1/ 34335335
	JT J		0.002636	23141	4.03412E-08	1/ 24788554
	Sure J		0.00193	31606	3.97673E-08	1/ 25146308
				total band EQ	1.09233E-07	1/ 9154744

Table 6 – 2600MHz band Exposure Quotient at South Exchange

End