

Cellular Mast Emissions Survey: St Catherine's Bay (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 EM emission surveys at all sites within the two Bailiwicks. The surveys were repeated in 2018 for a small selection of sites where changes were made by the operators. This report is for the St Catherine's Bay site located in Jersey.

The St Catherine's Bay site was used by all three mobile operators at the time of the 2018 survey: Airtel J, JT G and Sure G. 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.

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
St Catherine's Bay	800	0.2854	Sure J	136	0.000211845	1/ 4720
	900	0.7982	Sure J	52	0.000522891	1/ 1912
	1800	0.06178	JT J	944	2.6724E-05	1/ 37420
	2100	0.02908	Sure J	2098	5.22018E-06	1/ 191564
	2600	0.005439	Airtel J	11215	6.18449E-07	1/ 1616949
Total Site EQ					0.000767299	1/ 1303

Table 1 - Cumulative Exposure Quotient

The results show that the cumulative EQ was measured at 1/1303 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	St Catherine's Bay
Site address	St Catherine's Bay Breakwater, St Martin, Jersey
Site Latitude	49.22229
Site Longitude	-2.01079

1.2 Site Description

Operators	Airtel J, JT J, Sure J
Antenna types	Directional
Approximate height	6 – 10m
Site type	Lattice Tower
Description	The lattice tower at St Catherine's Bay is located at the end of the pier, access is open to the public.

1.3 Site Photo

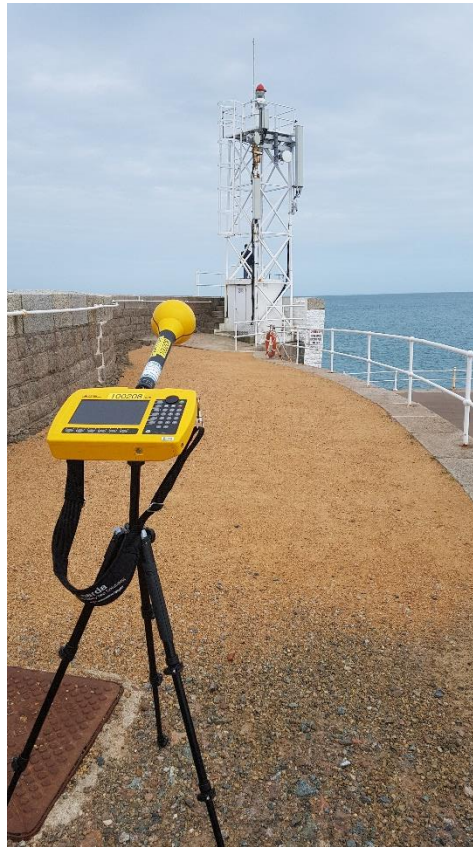


Figure 2 – Peak Measurement Location

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.

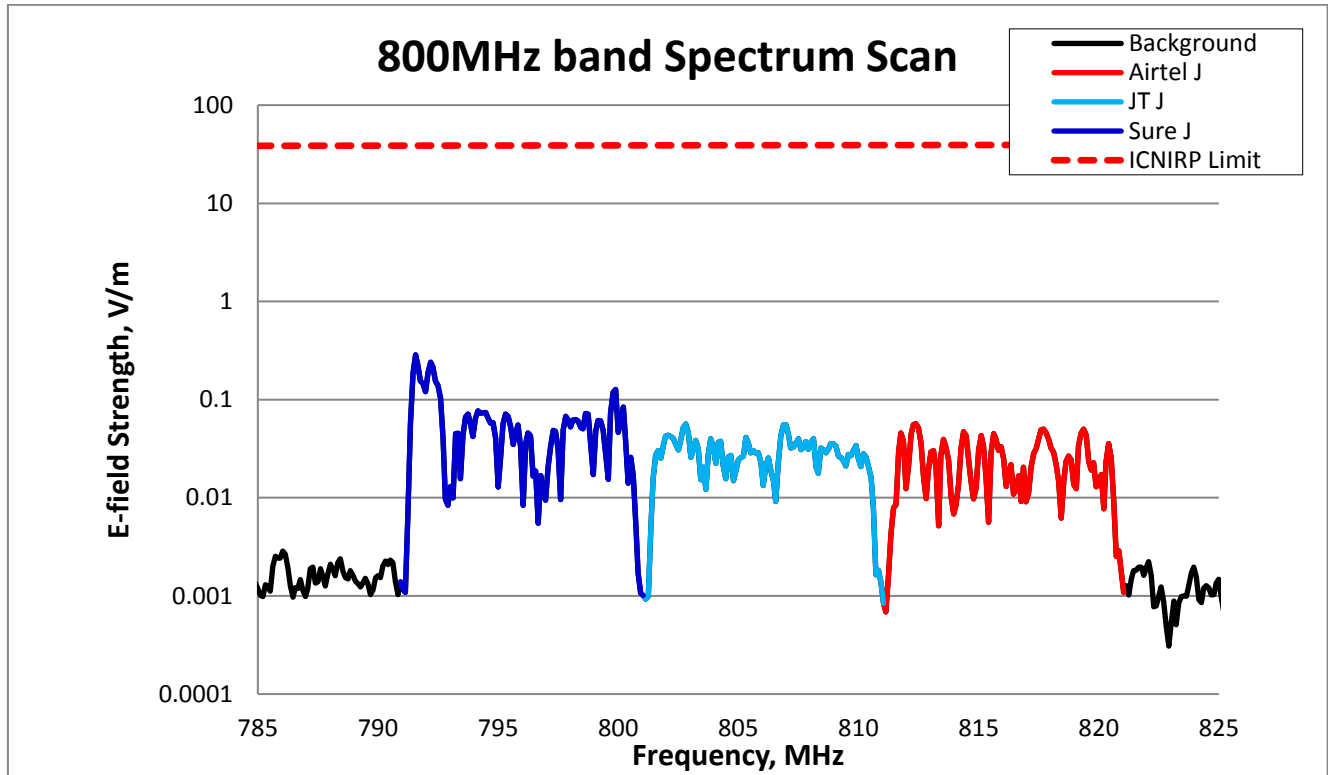


Figure 4 - 800MHz band Spectrum Scan

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 field level recorded across the band was higher than 0.2854 V/m (Sure J), which is 136 times smaller than the ICNIRP Reference level. 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
St Catherine's Bay	Airtel J	800	0.05662	687	1.98929E-05	1/ 50269
	JT J		0.05619	692	2.34818E-05	1/ 42586
	Sure J		0.2854	136	0.00016847	1/ 5936
total band EQ					0.000211845	1/ 4720

Table 2– 800MHz band Exposure Quotient at St Catherine's Bay

2.2 900 MHz Band

The graph for the 900 MHz activity is shown below:

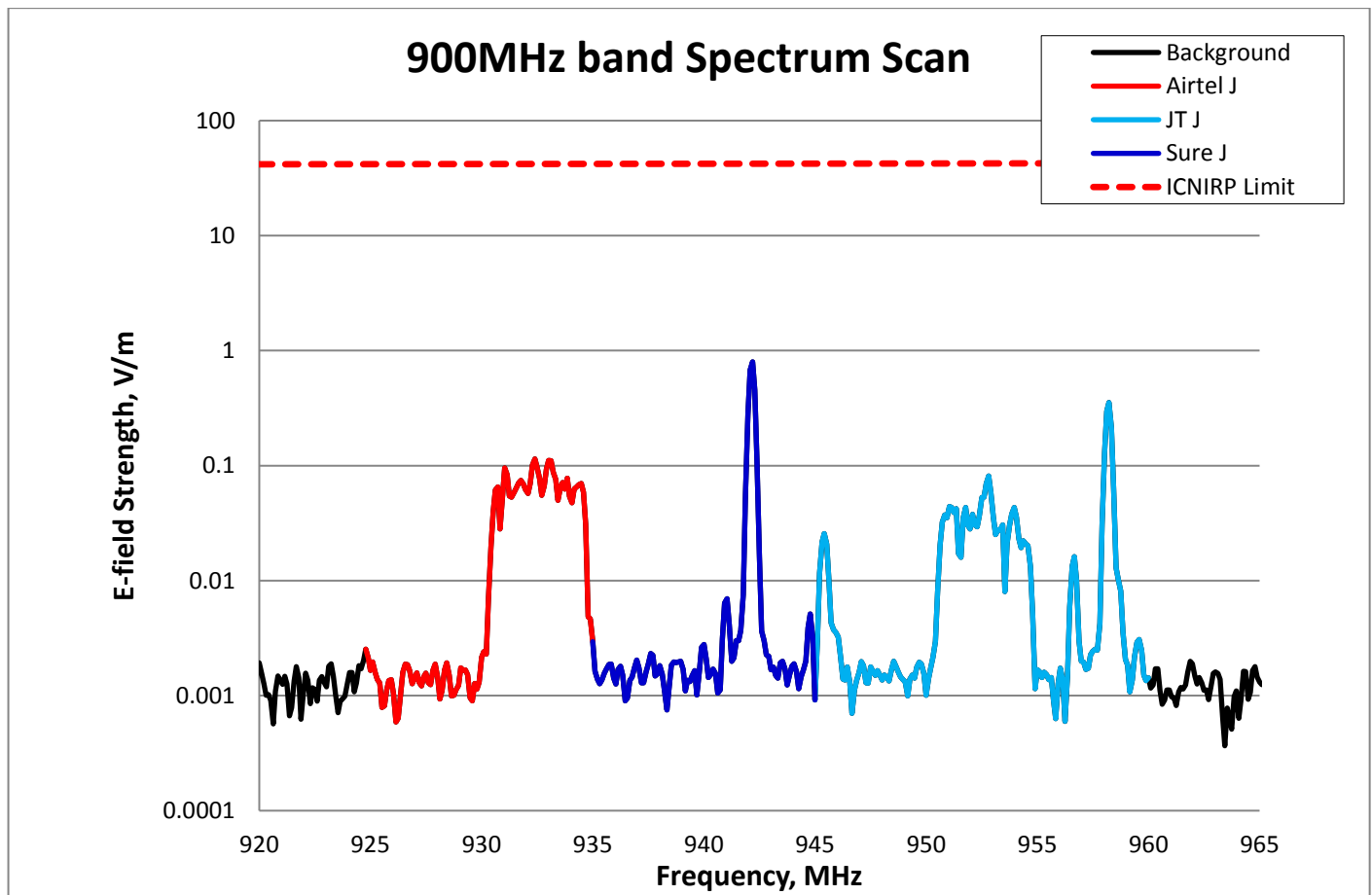


Figure 5 - 900MHz band Spectrum Scan

No field level recorded across the band was higher than 0.7982 V/m (Sure J), which is 52 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 900MHz 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
St Catherine's Bay	Airtel J	900	0.1142	361	5.70077E-05	1/ 17542
	JT J		0.3534	117	9.06747E-05	1/ 11028
	Sure J		0.7982	52	0.000375209	1/ 2665
total band EQ					0.000522891	1/ 1912

Table 3– 900MHz band Exposure Quotient at St Catherine's Bay

2.3 1800 MHz Band

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

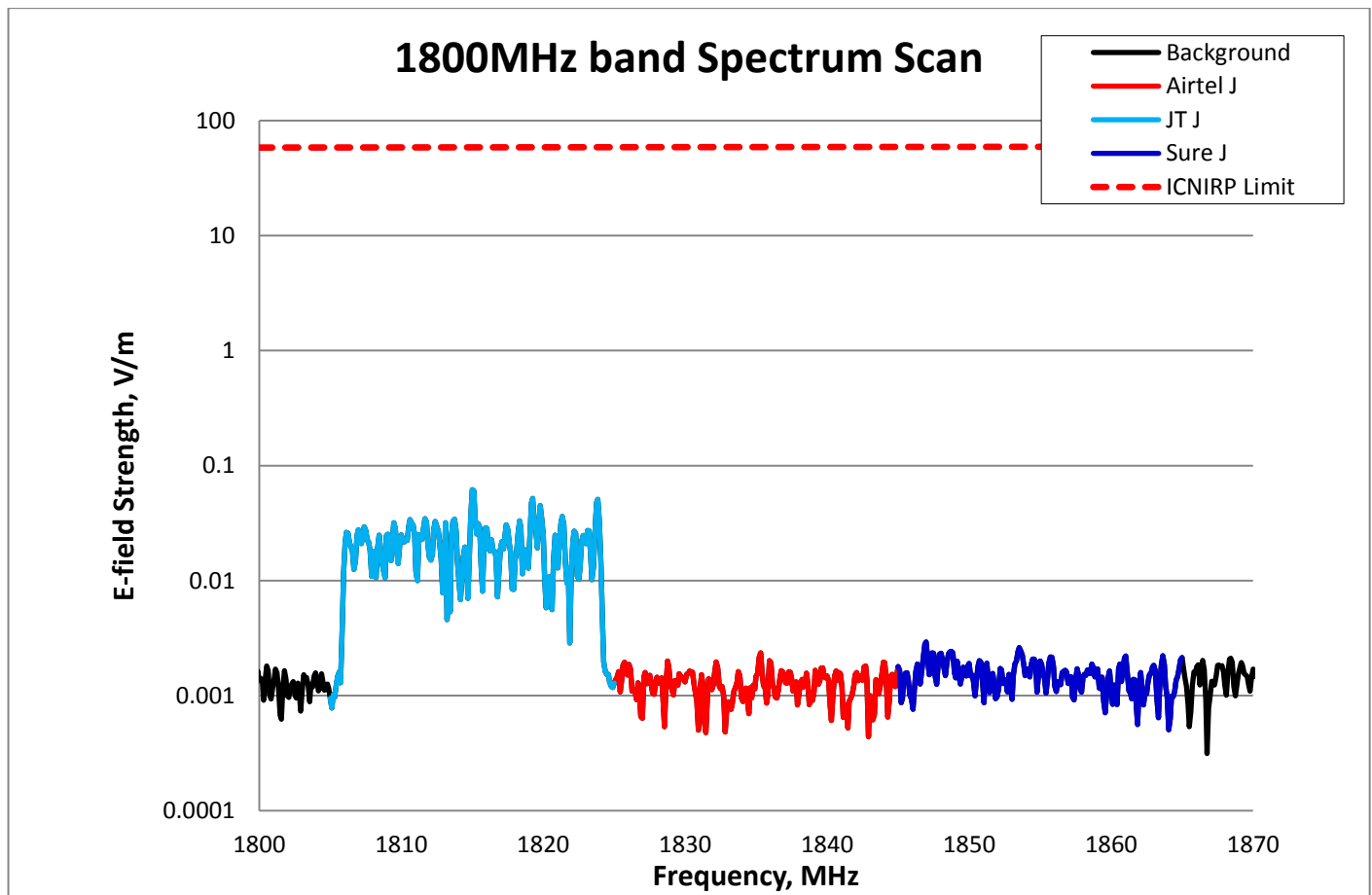


Figure 6 - 1800MHz Spectrum Scan

No field level recorded across the band was higher than 0.06178 V/m (JT J), which is 994 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 1800MHz 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
St Catherine's Bay	Airtel J	1800	0.002357	24750	8.97226E-08	1/ 11145458
	JT J		0.06178	944	2.65037E-05	1/ 37731
	Sure J		0.002933	19890	1.30546E-07	1/ 7660158
total band EQ					2.6724E-05	1/ 37420

Table 4 – 1800MHz band Exposure Quotient at St Catherine's Bay

2.4 2100MHz Band

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

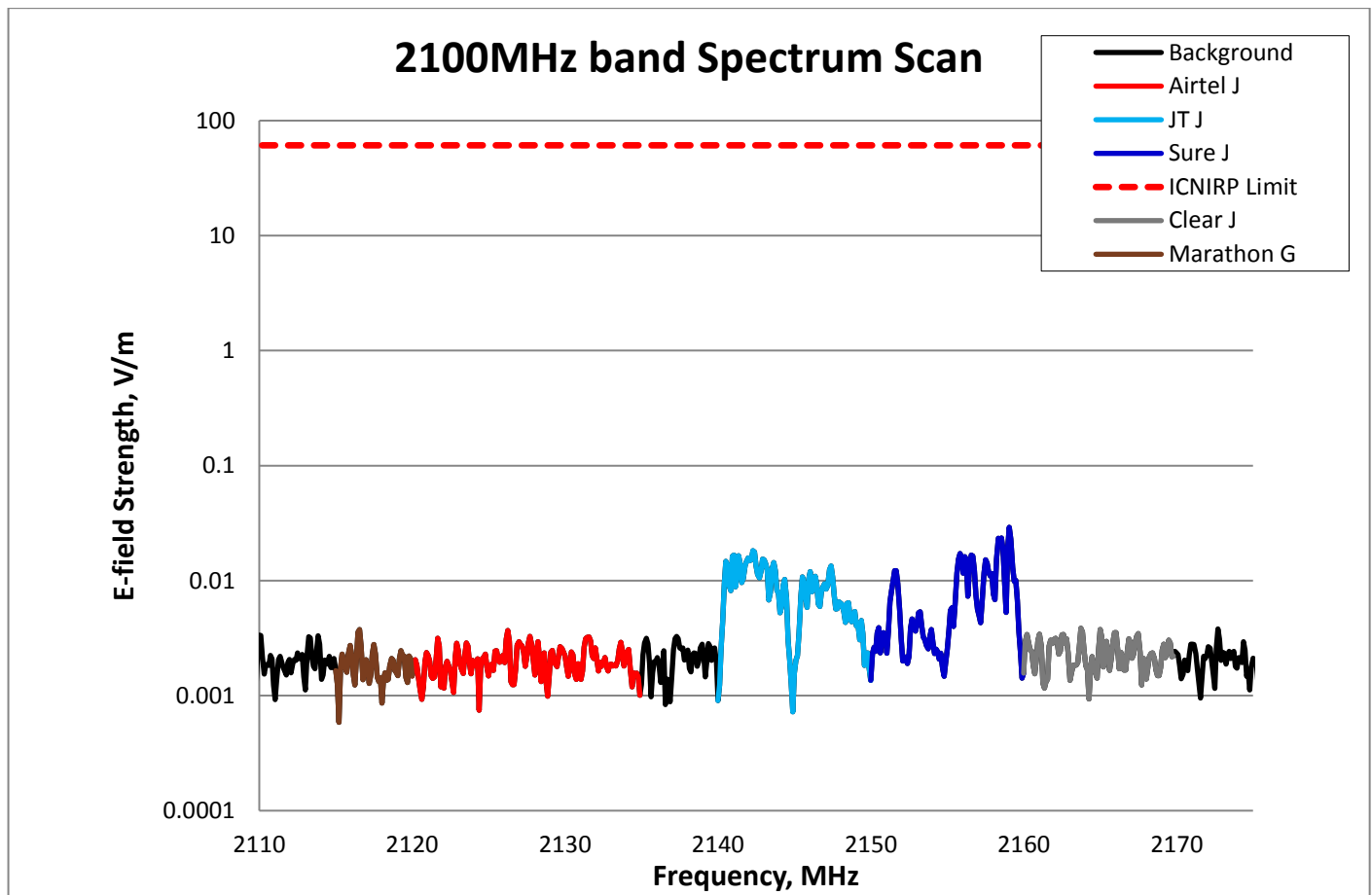


Figure 7 – 2100MHz band Spectrum Scan

No field level recorded across the band was higher than 0.02908 V/m (Sure J), which is 2098 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 2100MHz 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
St Catherine's Bay	Airtel J	2100	0.00368	16576	1.69096E-07	1/ 5913785
	Clear J		0.003851	15840	1.52228E-07	1/ 6569114
	JT J		0.01823	3346	2.34286E-06	1/ 426829
	Marathon J		0.003749	16271	5.0209E-08	1/ 19916763
	Sure J		0.02908	2098	2.50579E-06	1/ 399075
total band EQ					5.22018E-06	1/ 191564

Table 5 – 2100MHz band Exposure Quotient at St Catherine's Bay

2.5 2600MHz band

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

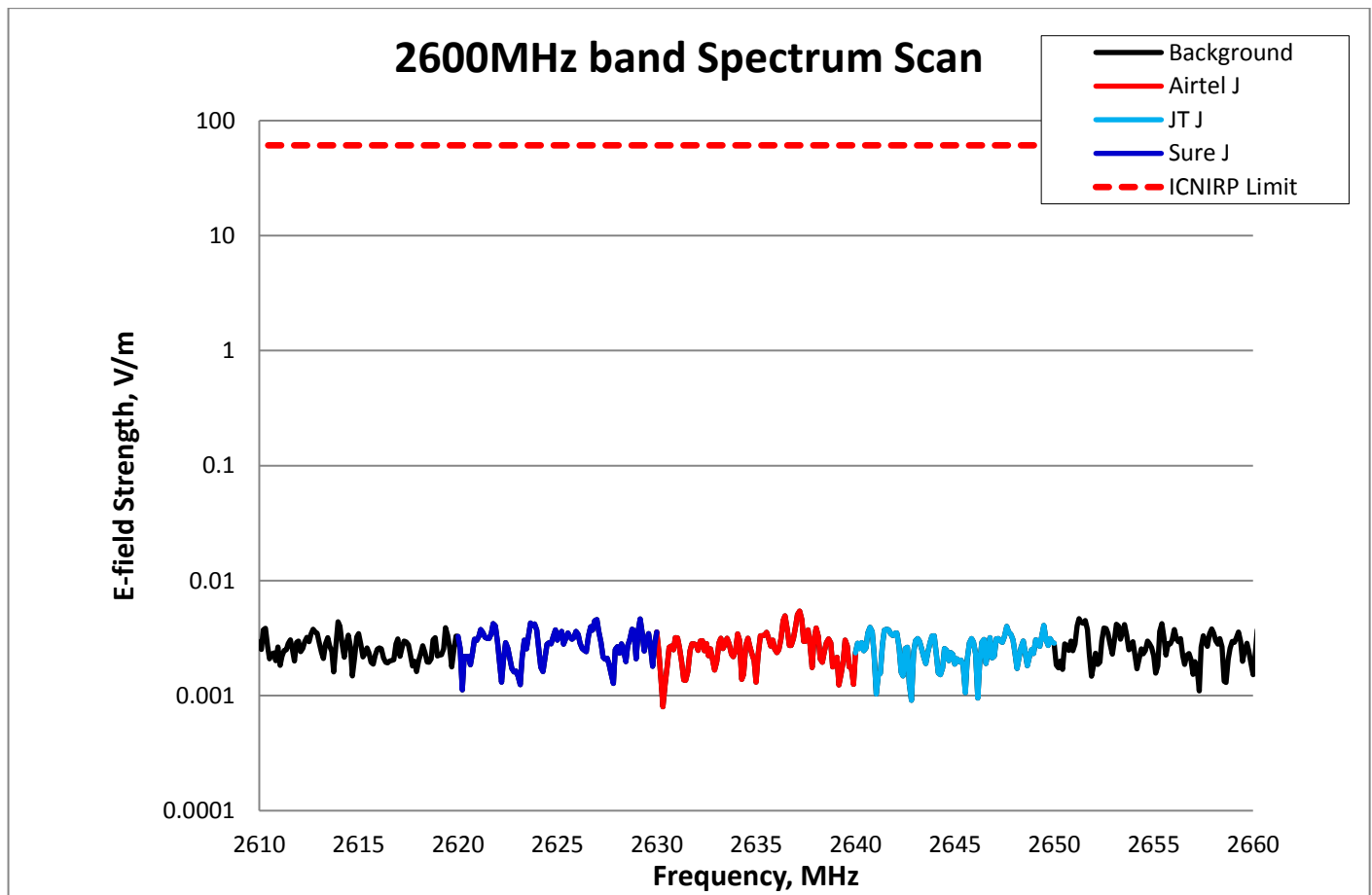


Figure 8 – 2600MHz band Spectrum Scan

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 2600MHz 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
St Catherine's Bay	Airtel J	2600	0.005439	11215	2.01886E-07	1/ 4953290
	JT J		0.004082	14944	1.88269E-07	1/ 5311542
	Sure J		0.004644	13135	2.28293E-07	1/ 4380326
total band EQ					6.18449E-07	1/ 1616949

Table 6 – 2600MHz band Exposure Quotient at St Catherine's Bay

End