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5G The facts – written by Alasdair Philips, Technical Director of EMFields Solutions Ltd

Many people are very concerned about the roll-out of 5G. We attempt to address some of the issues.

1. Our current Acoustimeter (AM10) and Acousticom2 (AC2) measure 5G signals up to 8 GHz. The main new 5G frequency bands are in the range 3.4 - 4.2 GHz. Some even lower frequency bands already in use for 2G and 3G mobile phones will be re-used for 5G. At present, the only use of 'mmWaves' (above 30 GHz) will be for localised experimental testing and other purposes.

2. In a few limited places in the USA, Verizon has launched its own '5G' variant in the 28 GHz high-band. The 2.6 and 3.5 GHz bands will be increasingly used in the USA during 2019. Other than in the centre of some main cities until at least 2022 anyone with a 5G mobile phone will usually be connected by 4G, not 5G. Many more base-stations/masts located close together are required for widespread use of 5G and this will take some years to roll-out.

3. High-band (above 24GHz) and mmWave (above 30 GHz) frequencies do not travel through trees, buildings or into vehicles. They will not be used as the main 5G mobile phone network, but instead will provide local 'hot-spots' in the home and open areas where there are many active users. For example, Verizon's current 'Home 5G' is available in a few places in the USA where a high-band-mast is within a few hundred meters in clear line of sight to an external antenna on your home.

4. 'mmWave' 5G will also be used to connect base stations to satellites. Individual mobile phones will still connect to these base stations using lower band (below 6 GHz) frequencies.

5. No scientific studies of the effects of 5G on cells and living beings have yet been carried out and published. The evidence on 2G, 3G and 4G suggests that adverse effects from 5G will be greater than those from the earlier technologies. If you are concerned, we suggest you avoid purchasing 5G mobile phones, tablets and 5G WiFi routers and Access Points for some years until new research has been carried out and properly evaluated.

6. As mobile technology is evolving, the technical team at EMFields Solutions Ltd are continuing to test new high-band sensors as they become available. So far, most of them are far from ideal for broad-band portable metering (due to relatively low sensitivity and high power consumption). Our first 5G product is likely to only measure the high-band (above 24 GHz) signals and will be needed in addition to, and not as a replacement of, the AM10 and AC2. Most microwave radiation that we are surrounded by and affected by will still be located in the lower frequency bands.

We hope these notes will help answer many of your questions regarding the measurement of 5G.