



Telstra Submission to ACMA Consultation: Review of the 850 MHz and 1800 MHz spectrum licence technical frameworks

Public submission

27 March, 2026



Executive Summary

We welcome the opportunity to provide our submission to the ACMA's consultation on **Review of the 850 MHz and 1800 MHz spectrum licence technical frameworks**.

In the main, we consider the existing licence conditions, section 145 determinations and Radiocommunications Advisory Guidelines (RAGs) are fit for purpose. There are only a few modifications required for the renewal of our ESLs.

Our submission advocates for the following:

- 850 MHz licence:
 - We support the ACMA implementing the 1 MHz downshift, by changing the frequency ranges in Table 1 of Schedule 1 in each licence, and amending descriptions of the band-edge in the schedules;
 - We ask that registration exemption is lifted to accommodate 3GPP Power Class 1 (PC-1) High Power User Equipment (HPUE);
 - We also ask that the 844 – 845 MHz band, once vacated, be also left as a guard band to provide improved protection to our mobile broadband network receivers; and
 - We recommend the change to registration exemption to accommodate HPUE is transcribed into licences for the extended 850 MHz band (3GPP Band 26).
- 1800 MHz licence:
 - Our strong first preference is for the ACMA's Option 2 (i.e., "3GPP Category B Option 1") for unwanted emission limits for the upper 1800 MHz frequency segment, however we recognise this may not be acceptable for rail communication use of the band. While the ACMA's Option 2 remains our strong first preference, we propose a new "Option 4" to add to the ACMA's three options (adoption of 3GPP Category B, Option 2 in all geographic locations), which we consider should be acceptable to rail communication use; and
 - We support the removal of rail-specific conditions in Schedule 2 of 1800 MHz licences.
- We support the ACMA's proposal to introduce a licensing mechanism to acknowledge and accommodate unwanted emissions from wideband amplifiers within other defined IMT bands. We support AMTA's position for some minor clarifications to be made to the ACMA's proposed text for our licences.
- Two other matters:
 - We support AMTA's proposal to establish agreements to mutually manage interference between licensees on either side of the existing 1800 MHz Regional/Remote spectrum border, and we refer the ACMA to AMTA's submission in this regard; and
 - We ask the ACMA change to registration exemption to accommodate HPUE in the 1800 MHz band (3GPP Band 3).



Contents

Executive Summary	2
1 Introduction.....	4
2 850 MHz Band	5
2.1 1 MHz Down-shift technical conditions	5
2.2 Power Class 1 device registration exemption	6
3 1800 MHz Band	7
3.1 General Spurious Emission Limits – No changes required from rail move to PTS licensing	7
3.2 Changes to unwanted emission limits in the upper 1800 MHz frequency segment.....	7
3.2.1 ACMA Option 1 – “Do Nothing” (Red line in Fig 1 & 2). Not supported	7
3.2.2 ACMA Option 2 – “Align with 3GPP Category B Option 1” (Yellow line in Fig 1 & 2). Telstra's first preference.....	8
3.2.3 ACMA Option 3 – “Bespoke 3GPP Category B Option 1”. Not Supported	8
3.2.4 Telstra Option 4 – “Align with 3GPP Category B Option 2 everywhere” (Green Line in Fig 1 & 2) - Telstra's second preference	8
3.3 Removal of Rail Specific conditions within the licence	11
4 Matters affecting both 850 and 1800 MHz bands	12
4.1 850 & 1800 MHz s.145 determinations & Advisory Guidelines	12
4.2 Wideband amplifiers	12
5 Issues not considered by this consultation	13
5.1 Managing the PTS Remote/Spectrum-licence boundary in the 1800 MHz band.....	13
5.2 Registration exemption limit to support Power Class 1 in the 1800 MHz band.....	13
6 Appendix 1: Response to consultation questions.....	14
6.1 Question 1 – s.145 determinations & advisory guidelines.....	14
6.2 Question 2 – Wideband amplifier provisions	14
6.3 Question 3 – 850 MHz Downshift	14
6.4 Question 4 – Removing rail conditions from 1800 MHz spectrum licences	14
6.5 Question 5 & 6 – 1800 MHz unwanted emissions.....	15
6.6 Question 7 – 1800 MHz rail services licensing framework.....	15
6.7 Question 8 – 850 & 1800 MHz framework impacts to other services	16
6.8 Question 9 & 10 – Issues not considered in this consultation	16



1 Introduction

We welcome the opportunity to respond to ACMA's consultation on **Review of the 850 MHz and 1800 MHz spectrum licence technical frameworks**. These spectrum bands are central to the operation of public mobile telephony and wireless broadband networks in Australia. It is important therefore to consider any changes with a view to maximizing continuity of service for the Australian community of these critical services.

We also note the arrangements being proposed for the conversion of rail operator spectrum licences to apparatus licences. Fundamentally, we ask that ACMA manage this transition noting the future desire of the mobile industry to see spectrum used for rail applications returned to public MNO use in the future, once rail transition to FRMCS networks on the 1900 MHz band is complete.

Our submission is structured as follows:

- Section 2 considers impacts specific to the 850 MHz band licences;
- Section 3 considers impacts specific to the 1800 MHz band licences;
- Section 4 considers matters that affect both bands;
- Section 5 discusses items that ACMA has not considered as part of this consultation; and
- Section 6 provides answers to the specific questions asked by ACMA.



2 850 MHz Band

Telstra has held spectrum in this band since the beginning of cellular mobile services using Analogue Mobile Phone Service (AMPS, “1G”) technology in 1987 and has managed the evolution of this spectrum through multiple technology generations for nearly four decades.

Telstra has also supported the ACMA’s long term strategy for the 803-960 MHz band and welcomes the fact that we have reached the end of this process to maximise the band’s utility for the Australian community. Specifically, Telstra supports the proposed final spectrum allocation arrangements to shift the 870-890 MHz band down 1 MHz to 869-889 MHz.

Creating a formal 1 MHz guard band between the 850 and 900 MHz network bands will:

- Improve the utility of the spectrum by providing a guard band between the 850 MHz and 900 MHz bands.
- Make the 850 MHz spectrum band contiguous with the 850 MHz expansion band.
- Maximise alignment with internationally harmonised 3GPP frequency band standards, which will improve the ability for all cellular networks to operate in close geographic proximity to each other.

One outcome sought by Telstra is the establishment of one single consistent set of technical operating conditions that covers operation across the entire 30+30 MHz of the unified 850 MHz band (i.e., 3GPP Bands 5 and 26). That is, we request common attributes across the entire base-station receive (814-844 MHz) and base-station transmit (859-889 MHz) elements of the FDD pair.

2.1 1 MHz Down-shift technical conditions

We have reviewed the proposed technical condition changes regarding operating frequency and non-spurious emissions and agree with the proposals made by ACMA. Specifically:

- Transmitters or receivers operating in the range 870–890 MHz be changed to 869–889 MHz.
- Transmitters or receivers operating in the range 825–845 MHz be changed to 824–844 MHz.
- Unwanted emissions that apply inside or outside the range 849–890 MHz be changed to 849–899 MHz.

In this regard, we believe that the last dot point at the bottom of pg. 13 of the consultation paper has two small typographical errors:

- “Unwanted emissions that apply inside or outside the range 849–~~890~~ 900 MHz be changed to 849–~~889~~ 899 MHz”.

In addition, we have reviewed the unwanted emission limits in the Core conditions (in Schedule 2) of an 850 MHz spectrum licence,¹ for upper band (BS) transmitters, and found the following errors:

- Core condition #8 specifies the limits on spurious emissions outside the range 849-899/900 MHz, for non-AAS transmitters. The description provided is: “*The unwanted emission limits in Table 3, measured over the measurement bandwidth, apply to non-AAS transmitters operating in the frequency range 870 MHz-890 MHz ~~from~~ for emissions falling ~~into~~ outside the frequency range 849 MHz-900 MHz*”.
- Core condition #9 specifies the limits on spurious emissions outside the range 849-900 MHz for AAS transmitters. The description provided is: “*The unwanted emission limits in Table 4, measured over the measurement bandwidth, apply to radiocommunications transmitters with*

¹ For example, Telstra’s (updated) licence 9263433, dated 9 Feb, 2023.



AAS operating in the frequency range 870 MHz-890 MHz ~~from~~ for emissions falling ~~into~~ outside the frequency range 849 MHz-900 MHz”.

- Thirdly, the emission limits are specified in terms of dBm EIRP; which needs to be changed to **“Total Radiated Power / TRP (dBm)”**.

Finally, we ask that the 844–845 MHz band, once vacated, be also left as a guard band to provide improved protection to our mobile broadband network receivers from the existing fixed link and trunked land mobile users operating in the 845-854 MHz band.

2.2 Power Class 1 device registration exemption

Telstra is concerned that the registration exemption limit proposed for the new 850 MHz licences imposes a significant utility reduction compared to the current licence conditions. This affects future access to higher power user equipment (HPUE) being specified by 3GPP and developed by industry. HPUE show promise in improving support for Public Safety Mobile Broadband (PSMB) applications in Australia.

Currently, Schedule 3 Section 4 of our 875-890 MHz licences says user equipment is exempt from the registration requirement if it operates with a radiated power of 30 dBm EIRP per 1 MHz. Given the ~15-year term of the future 850 MHz licences, and the expected developments in 3GPP to support HPUE operation for certain use cases (including supporting Public Safety Mobile Broadband (PSMB) higher power mobile broadband terminals), it is Telstra’s position that expiring licences should be re-issued with the ability to operate at 3GPP Power Class 1 (PC-1) level.

We therefore request the ACMA lift the proposed registration exemption limit from 30 dBm EIRP per 1 MHz (as per current Band 5 licences) to **33 dBm TRP per occupied channel**, in the renewed licences band.

Consistent with our request for a single, consistent set of licence conditions across the entire 850 MHz band (i.e., both 3GPP Bands 5 and 26), we also request the registration exemption limit in the Band 26 (i.e., 859-869 / 814-824 MHz) extended band is also amended to 33 dBm TRP per occupied bandwidth to accommodate future 3GPP PC-1 devices.



3 1800 MHz Band

We broadly support the intent of the ACMA to retain the existing licence **technical conditions** on the renewed 1800 MHz spectrum licences for MNOs. This is important given that the conditions previously applied to the entire 1710-1785 MHz / 1805-1880 MHz band and as a result all deployed network equipment has been certified against those technical conditions.

3.1 General Spurious Emission Limits – No changes required from rail move to PTS licensing

One key concern of Telstra is to ensure that ACMA does not make any adverse changes to the spectrum emission band limits that would affect already deployed equipment, despite the conversion of part of the spectrum licence band to PTS licensing.

Telstra asks that the following clauses in the renewed 1800 MHz licence **remain as they are today**, to facilitate continued operation of existing networks following licence renewal.

Specifically, we ask for the following to remain as is:

- Schedule 2 Part 6, 7, 10 & 11 (a) “operating inside the 1805-1880 MHz frequency band”;
- Schedule 2 Part 6, 7, 10 & 11 (b) “within the 1795-1890 MHz frequency band” and the corresponding values in Table 3, Table 4, Table 7 and Table 8 to be unchanged;
- Schedule 2 Part 8, 9, 12 & 13 (a) “operating inside the 1710-1785 MHz frequency band”;
- Schedule 2 Part 13 (b) “at frequencies outside the 1795-1890 MHz frequency band” and the corresponding values in Table 10 to be unchanged;
- Schedule 2 Part 15 (a) “for receivers operating inside the 1710-1785 MHz frequency band”;
- Schedule 2 Part 15 (b) “at frequencies outside the 1795-1890 MHz frequency band”; and
- Schedule 2 Part 16 “The unwanted emission limits in Table 11 apply to all radiocommunications receivers operating inside the 1805-1880 MHz frequency band”.

While the MNOs will not operate above 1865 MHz in the areas where the spectrum licence will be converted to PTS apparatus licenses for the rail operators, we cannot accept a change in the frequency range over which the unwanted emissions requirements apply in those geographic areas – as that is determined by the hardware capabilities of the existing 1800 MHz MNO networks.

3.2 Changes to unwanted emission limits in the upper 1800 MHz frequency segment

Telstra notes the ACMA has offered to consider once more the long-standing industry position that we prefer emission standards based on 3GPP specifications and corresponding ETSI standards are used. We thank the ACMA for considering our request. Aligning to 3GPP and ETSI standards allows MNOs to procure “off-the-shelf” standardised equipment, without need for modification or operating at reduced power levels to meet bespoke Australian standards. This allows MNOs to tap into “global” economies of scale, reduces operator costs (more base stations are otherwise required at lower power), which keeps prices lower for Australian consumers.

In the case of unwanted emission limits in the upper 1800 MHz frequency segment, Telstra offers the following views on each of the ACMA options proposed.

3.2.1 ACMA Option 1 – “Do Nothing” (Red line in Fig 1 & 2). Not supported

Given the mobile industry long held position, and increasing difficulties in sourcing equipment that meets the bespoke Australian standards, Telstra does not support ACMA Option 1. The current unwanted



emission limits in certain cases either require us to add external filtering to 3GPP Band 3 transmitters, or more likely, reduce the overall transmitter power until unwanted emissions fall below the limits, which results in inefficient use of the spectrum. Either choice is a suboptimal outcome, so maintaining the licence emission requirements as they currently are will, in time, increasingly devalue the band. We do not support maintaining the status quo.

3.2.2 ACMA Option 2 – “Align with 3GPP Category B Option 1” (Yellow line in Fig 1 & 2). Telstra’s first preference

ACMA Option 2 proposes emissions standards aligned with 3GPP Category B Option 1 base station specifications for our renewed 1800 MHz licences. Alignment with 3GPP specifications is important as it removes restrictions on what equipment can be used on the band, and maximises our ability to migrate the spectrum to new technologies in the future – such as 6G which is expected to commence in the early 2030s.

Option 2 is our first preference because it offers the greatest flexibilities for MNOs to deliver service to Australian consumers using this spectrum. Changing the licence conditions now also supports the long-term outcome where we expect to see mixed GSM-R / LTE use of the band cease within 5-7 years, in line with the rail networks moving to the dedicated 1900 MHz FRMCS technology for critical rail communications and signalling use cases. Given this is a long-term licence, this would then establish the correct conditions to support future uses of the band.

3.2.3 ACMA Option 3 – “Bespoke 3GPP Category B Option 1”. Not Supported

ACMA Option 3 proposes to introduce 3GPP Category B Option 1 limits, but then modifies them to revert to the ACMA Option 1 bespoke limits above either 1865 MHz in Brisbane, Sydney, Perth and Melbourne or 1870 MHz in Adelaide. While this option introduces a solution that facilitates ACMA Option 2 except in areas with rail corridors that are licenced where ACMA Option 1 is applied, this approach still places unnecessary restrictions on deployable hardware throughout each of these major metropolitan markets.

Due to the complexities this option creates for deployment planning, and the creation of a situation where different licence conditions apply at different segments of the band, we do not support this option. Situations where technical conditions apply differently in different parts of a single band reduces future spectrum trading opportunities, which is viewed as a negative outcome for the industry, especially since the opportunity to acquire the GSM-R spectrum may arise in the future.

3.2.4 Telstra Option 4 – “Align with 3GPP Category B Option 2 everywhere” (Green Line in Fig 1 & 2) - Telstra’s second preference

While Telstra’s first preference is ACMA Option 2, we do recognise that this option is likely to cause concern for the existing GSM-R rail users on the band. Therefore, Telstra recommends consideration of an alternative to ACMA Options 2 and 3 that meets the MNOs’ long-term objectives for this spectrum while minimising the impacts on rail industry spectrum users.

To substantially address concerns from the GSM-R network operators, we propose that the ‘3GPP Category B Option 2’ base station emission specification, as defined for the European market, could instead be adopted for the 1800 MHz band in Australia as opposed to ‘3GPP Category B Option 1’.

The European unwanted emission framework was architected in an environment where GSM/LTE coexistence in 1800 MHz was the dominant real-world constraint, and that reality strongly shaped:

- CEPT’s preference for absolute spurious limits
- ETSI’s conservative harmonised standards
- 3GPP’s need for a Europe specific option in TS 38.104

These organisations recognised that the spectrum environment was very crowded in Europe, as it is today in Australia. The resulting standards reflected the need to manage spectrum sharing and co-

existence carefully. This is why we believe a move to 3GPP Category B Option 2 unwanted emission standards is a worthy alternative.

**3GPP TS 38.104 V19.3.0 (2025-12) Category B Base Station Unwanted Emissions Option 2
(Extract)**

6.6.4.2.2.2 Category B requirements (Option 2)

The limits in this clause are intended for Europe and may be applied regionally for BS operating in bands n1, n3, n7, n8, n38, n65, n100, n101.

For a BS operating in bands n1, n3, n8, n65 or BS type 1-C operating in bands n7, n38, n100 or n101, *basic limits* are specified in Tables 6.6.4.2.2.2-1 and 6.6.4.2.2.2-1a.

Table 6.6.4.2.2.2-1: Regional Wide Area BS operating band unwanted emission limits for above 3 MHz channel bandwidth for Category B

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Basic limits (Note 1, 2)	Measurement bandwidth
$0 \text{ MHz} \leq \Delta f < 0.2 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.215 \text{ MHz}$	-14 dBm	30 kHz
$0.2 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.215 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	$-14 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.215 \right) \text{ dB}$ (Note 5)	30 kHz
(Note 4)	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.5 \text{ MHz}$	-26 dBm (Note 5)	30 kHz
$1 \text{ MHz} \leq \Delta f \leq \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$1.5 \text{ MHz} \leq f_{\text{offset}} < \min(10.5 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-13 dBm (Note 5)	1 MHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm (Note 3) (Note 5)	1 MHz
<p>NOTE 1: For a BS supporting <i>non-contiguous spectrum</i> operation within any <i>operating band</i>, the minimum requirement within <i>sub-block gaps</i> is calculated as a cumulative sum of contributions from adjacent <i>sub-blocks</i> on each side of the <i>sub-block gap</i>, where the contribution from the far-end <i>sub-block</i> shall be scaled according to the <i>measurement bandwidth</i> of the near-end <i>sub-block</i>. Exception is $\Delta f \geq 10 \text{ MHz}$ from both adjacent <i>sub-blocks</i> on each side of the <i>sub-block gap</i>, where the minimum requirement within <i>sub-block gaps</i> shall be -15dBm/1MHz. For BS supporting multi-band operation, either this limit or -16dBm/100kHz (f_{offset} adjusted according to the measurement bandwidth), whichever is less stringent, shall apply at $\Delta f \geq 10 \text{ MHz}$ for operating bands <1GHz.</p> <p>NOTE 2: For a <i>multi-band connector</i> with <i>Inter RF Bandwidth gap</i> $< 2 \cdot \Delta f_{\text{offset}}$, the minimum requirement within the <i>Inter RF Bandwidth gaps</i> is calculated as a cumulative sum of contributions from adjacent <i>sub-blocks</i> or RF Bandwidth on each side of the <i>Inter RF Bandwidth gap</i>, where the contribution from the far-end <i>sub-block</i> or RF Bandwidth shall be scaled according to the <i>measurement bandwidth</i> of the near-end <i>sub-block</i> or RF Bandwidth.</p> <p>NOTE 3: The requirement is not applicable when $\Delta f_{\text{max}} < 10 \text{ MHz}$.</p> <p>NOTE 4: This frequency range ensures that the range of values of f_{offset} is continuous.</p> <p>NOTE 5: For BS supporting multi-band operation, either this limit or -16dBm/100kHz (f_{offset} adjusted according to the measurement bandwidth), whichever is less stringent, shall apply for operating bands <1GHz.</p>			

The following charts compare the outcome of selecting this as the preferred solution. Telstra has made a comparison chart based on a non-AAS transmitter site consisting of 4 parallel transmitter ports per sector. This is a real-world deployment scenario used across Telstra's networks on this band where MIMO techniques have been utilised. (It should be noted that the baseline for this chart as a result is different to what has been presented by ACMA which based their presented options on a single transmitter port scenario when converting from EIRP to measured emissions.) For clarity, we have presented separate non-AAS and AAS charts in Figures 1 and 2 below.

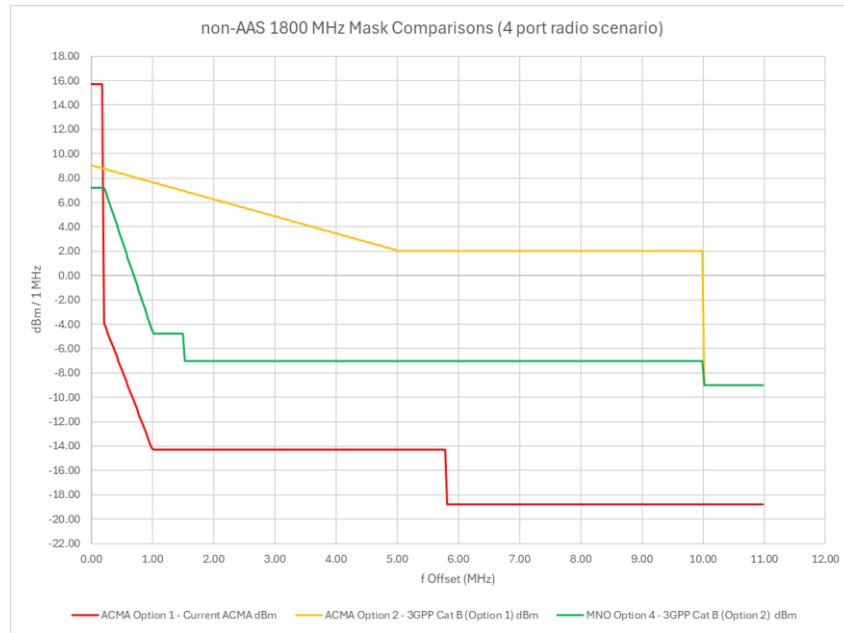


Figure 1: Options for unwanted emission limits for non-AAS transmitters

From this chart, it can firstly be seen that '3GPP Category B Option 2', has significant benefits (between 9 and 13dB) over the ACMA Option 2 '3GPP Category B Option 1' proposal in terms of adjacent channel unwanted emissions. It is acknowledged, however, that it is still an increase over the existing ACMA licence levels.

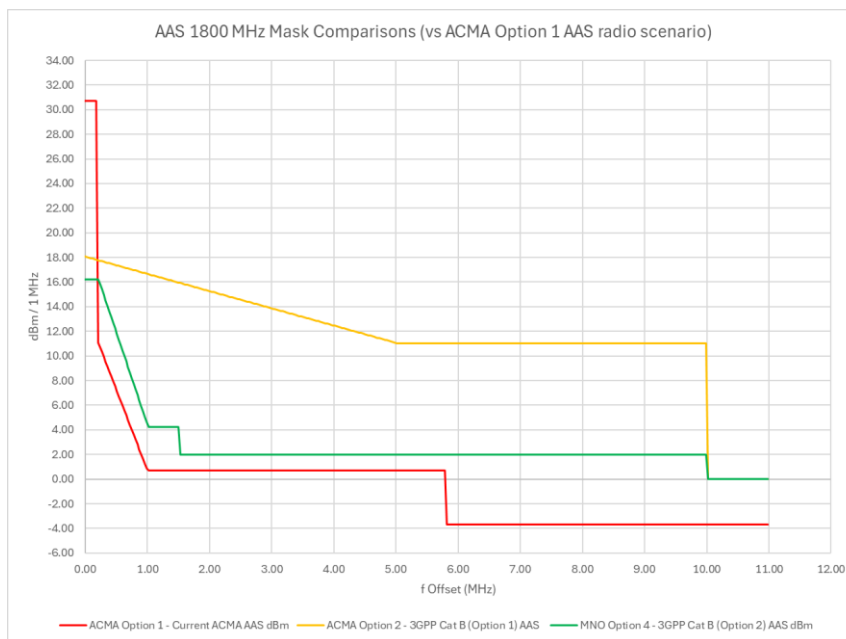


Figure 2: Options for unwanted emission limits for AAS transmitters

When comparing the results for AAS antenna solutions, the difference between the current ACMA limits and the proposed new AAS limits is much less. This is a result of us benchmarking the new proposed Cat B emissions against a 4 port non-AAS equivalent site. The good news with the AAS version is that the difference between the current and the proposed Category B Option 2 standards is relatively minor compared with Option 2 and 3 proposed by ACMA.



We also see that implementing 3GPP Category B Option 2 standards may require some additional coordination requirements defined to ensure coordination with rail spectrum users is maintained. We would welcome the opportunity to discuss any additional measures with the ACMA and rail operators using GSM-R technology. We consider this can be implemented through RALI and/or RAG changes, which can be done after the ESL process is completed for the 1800 MHz band.

3.3 Removal of Rail Specific conditions within the licence

We support the ACMA's proposed changes to remove from the 1800 MHz band, licence conditions that related solely to rail operators. Specifically, we support the removal of the following sections referencing GSM-R transmitters in the 1800 MHz spectrum licences:

- Schedule 2 Section 20 Part (a)
- Schedule 2 Section 21 Part (a)

We also support the removal of GSM-R references in 4(b) and 4(c) however we would draw attention to the fact that Part 4(c) effectively granted the equivalent of Power Class 1 to the rail network operators, something that as an MNO would like to see extended to all owners of spectrum licences in this band. (refer to section 5.2 for further information).



4 Matters affecting both 850 and 1800 MHz bands

4.1 850 & 1800 MHz s.145 determinations & Advisory Guidelines

We support the proposal by ACMA to not alter the existing s.145 determination conditions specified for both the 850 & 1800 MHz bands.

Further, we also support the ACMA proposal not to make changes to the existing advisory guidelines for either band.

4.2 Wideband amplifiers

Telstra supports the proposal by the ACMA to introduce a licensing mechanism to acknowledge and accommodate unwanted emissions from wide band amplifiers in mobile networks. We note that the proposed changes to the 850 MHz and 1800 MHz licences are commensurate with the ACMA's conditional regulatory forbearance for wideband amplifiers.

We consider there are some minor drafting changes that should be made to the proposed text for inclusion in our licences, and we agree with and support AMTA's position to provide greater flexibility and clarity including that:

- a) the transmitter does not necessarily need to be *operating* in both applicable bands for the provision to apply;
- b) that the provisions should expand to situations where the two relevant licences may be held by different licensees, but there is an agreement between them;
- c) the provisions reflect that the unwanted emissions permitted to be exceeded are the generic spurious emission limits that apply to very broad frequency ranges, e.g. 1 GHz to 12.75 GHz, and not any deliberate unwanted emission limits specifically introduced with a view to facilitate certain coexistence scenarios; and
- d) that any unwanted emission limits on the other licence that are applicable to user equipment (UE) are not required to be adhered to by base station transmitters (and vice versa).

Additional detail on the proposed amendments to the ACMA's draft text can be found in AMTA's submission.



5 Issues not considered by this consultation

5.1 Managing the PTS Remote/Spectrum-licence boundary in the 1800 MHz band

We support the AMTA proposals for improving the utility of the 1800 MHz Spectrum licence boundary, with regards to being able to establish agreements to mutually manage interference between licensees on either side of the existing 1800 MHz Regional/Remote spectrum border. Indeed, we would like to see the same arrangements extended to the 2 GHz spectrum licence boundary in the future.

5.2 Registration exemption limit to support Power Class 1 in the 1800 MHz band

While ACMA has decided not to consider Power Class 1 (PC-1) extension in the two bands at this time, we propose that, for administrative efficiency, this is the right time to facilitate this change.

Some spectrum licence holders (the rail operators) already have conditions on their spectrum licence that facilitate PC-1 operation. In this case, extending the allowance a further 5 dB from the current +28 dBm TRP per occupied bandwidth (1800 MHz licences) to +33 dBm TRP per occupied bandwidth for all users, and noting that this does not raise out of band emission standards, it should be clear that such a change is negligible in nature.

Future high power UE band use cases are developing within the 3GPP ecosystem for this technology, including support for future vehicle based mobile broadband and fixed wireless broadband (including in particular support for PSMB use cases). Given the length of time the licences will be renewed for, support for these newer use cases, particularly as the spectrum moves towards 5G and 6G in the next decade should be under active consideration.

In considering the likely impact of a change to allow registration exempt operation up to 33 dBm TRP per occupied channel, the ACMA should note that spurious and out of band emissions remain fixed at PC-3 levels in the 3GPP specifications. Thus, compliant PC-1 equipment produce no greater unwanted emissions than a PC-3 device, and therefore should have no greater impact on adjacent services. It is also worth noting that not all devices will be able to operate at PC-1. In particular, the fact that mobile handsets are not platforms able to be configured for this power class (due to EMR limitations) mean that the probability of a suitable PC-1 device coming physically close enough to a vulnerable victim receiver, and then demanding access to the full PC-1 power allocation, is always going to be much lower than the chance someone walks by with a handheld UE in their pocket.



6 Appendix 1: Response to consultation questions

6.1 Question 1 – s.145 determinations & advisory guidelines

Question 1

Do you agree that the existing section 145 determinations and advisory guidelines for the 850 MHz and 1800 MHz band can remain unchanged to support the renewed spectrum licences?

As per section 4.1 above, we agree with the ACMA position to retain the s.145 Determination, and the two RAGs unchanged.

6.2 Question 2 – Wideband amplifier provisions

Question 2

Do you think that that the proposed condition to support the operation of wideband amplifiers would facilitate scenarios envisioned by licensees? In which frequency bands do licensees intend to operate wideband amplifiers? Should these arrangements also be included in the technical framework for AWL and/or PTS apparatus licences?

Telstra supports the proposal by the ACMA to introduce a licensing mechanism to acknowledge and accommodate unwanted emissions from wide band amplifiers in mobile networks. We consider there are some minor drafting changes that should be made to the proposed text for inclusion in our licences, and we agree with and support AMTA's position to provide greater flexibility and clarity. Further detail can be found in section 4.2 of this submission.

6.3 Question 3 – 850 MHz Downshift

Question 3

Do you agree with the proposed changes to incorporate the frequency downshift in renewed 850 MHz band licences?

Telstra agrees with the proposed changes but recommends the details be reviewed as per our feedback in section 2 of our submission.

6.4 Question 4 – Removing rail conditions from 1800 MHz spectrum licences

Question 4

What are your views on the proposed removal of rail-specific conditions from renewed 1800 MHz band spectrum licences?

Telstra agrees with removing the rail specific conditions from the spectrum licence technical conditions.



6.5 Question 5 & 6 – 1800 MHz unwanted emissions

Question 5

What are your views on the proposed options for unwanted emissions for transmitters in the upper 1800 MHz frequency segment?

Telstra's strong first preference is to adopt ACMA "Option 2", which introduces 3GPP Category B Option 1 unwanted emission limits in all geographic locations (i.e., no geographic restriction on the use of 3GPP Category B Option 1). However, we recognise that this is likely to be unacceptable to rail network operators still using GSM-R protocols. We note that in Europe, the need to coexist between LTE and GSM in mobile bands (in part, to accommodate GSM-R) resulted in the development of 3GPP Category B Option 2 unwanted emission limits. We observe that the ACMA has not included this mask (3GPP Category B Option 2) amongst its options for unwanted emission limits, so we propose a fourth option ("Telstra Option 4") which would introduce 3GPP Category B Option 2 as the unwanted emissions limit.

As an alternative to our first preference of 3GPP Category B Option 1 (i.e., "ACMA Option 2"), we would accept 3GPP Category B Option 2 (i.e., "Telstra Option 4") in all geographic locations.

We also see that implementing 3GPP Category B Option 2 standards may still require some additional coordination requirements defined to reduce the impact to rail spectrum users back to existing levels. We would welcome the opportunity to discuss any additional measures with the ACMA and rail operators using GSM-R technology. We consider this can be implemented through RALI and/or RAG changes, which can be done after the ESL process is completed for the 1800 MHz band.

Further details can be found in section 3.2.4 of our submission.

Question 6

Can you provide any analysis or other evidence on coexistence with adjacent band services that would support consideration of Option 3?

Telstra does not support option 3. See section 3.2.4 of our submission for details.

6.6 Question 7 – 1800 MHz rail services licensing framework

Question 7

What are your views on the proposed high-level licensing and technical arrangements for rail services in the 1800 MHz band, which are intended to apply after the expiry of spectrum licences?

Telstra requires that the new rail conditions do not in any way increase the regulatory constraints on the renewed MNO spectrum licences.

In addition, Telstra is of the view that the new rail PTS Apparatus licences should only be issued for 5 years, with subsequent renewals after that offered on a reduced cadence. We understand that rail industry support for GSM-R will cease in Europe from 2035² and as a result, we are of the view that the temporary use of the spectrum as apparatus PTS licences for existing rail networks should be structured so as to encourage migration to the new FRMCS 1900 MHz service band rather than prolong the loss of value of the 1800 MHz band.

² According to the International Union of Railways website, "End of support for GSM-R is expected around 2035". See <https://uic.org/rail-system/telecoms-signalling/frmcs>



Finally, we are of the view that renewal or creation of new PTS Rail licences should only occur where existing infrastructure has been deployed. Commencing any new rail network deployment on this band post 2026 in our view conflicts with the efforts being made to support rail industry access to the 1900 MHz FRMCS band.

6.7 Question 8 – 850 & 1800 MHz framework impacts to other services

Question 8

What are your views on the potential effect that the proposed changes to the 850 MHz and 1800 MHz band technical frameworks may have on other services?

As we are supportive of maintaining the existing technical frameworks, we do not see any new impacts arising for other adjacent band services.

6.8 Question 9 & 10 – Issues not considered in this consultation

Question 9

What are your views on the issues not being considered by this consultation?

We support the AMTA position describing a way forward for how to better utilise the 1800 MHz regional spectrum licence band where they form a border with the remote area PTS licencing arrangements. The current ACMA arrangements are very wasteful and need to consider improved ways of unlocking as much spectrum value for the community as a whole.

Question 10

Do you have further information on the use cases and coexistence of PC-1 devices with other services that can assist in the future consideration of this issue?

3GPP PC-1 has effectively been permitted on the band for many years, through the allowance of rail cabin radios operating at 31 dBm transmit power. In addition, it is worth noting that the 3GPP unwanted and spurious emissions specification for PC-1 UE devices is unchanged compared with PC-3 devices. Therefore, given the long period of time that PC-1 devices have been active in at least part of the band, and the fact that out of band impacts are unchanged when comparing PC-1 and PC-3 devices, we believe there is a clear justification to allow PC-1 device access for all spectrum licence holders on the band, not just rail networks.

See section 5.2 of our submission for further detail.