FM broadcasting services band in the Perth RA1 licence area

Options paper

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Executive summary

The Australian Communications and Media Authority (ACMA) is considering replanning FM frequencies in the Perth RA1 licence area. For many years, the full use of the FM broadcasting services band in Perth has been constrained due to VHF Band II analog TV on channels 3 and 5 in Bunbury. These channels have not been used for television since the switchover to digital TV in 2013, creating an opportunity to make additional high-power/wide-coverage FM frequencies available in Perth. The replanning should enable more efficient spectrum use while minimising required changes to the existing services in the Perth licence area or surrounding areas.

*The future delivery of radio: Final report*[[1]](#footnote-2) released in March 2020 states that the ACMA will:

… continue to progress to public consultation our work on the potential for replanning the Perth FM band to potentially enable conversion of all commercial and national radio broadcasting services to FM. This could overcome Perth’s unique geographic circumstances, which result in poor AM propagation.

The ABC and the 2 commercial AM broadcasters have previously sought a solution to the poor AM reception in Perth, which is due to the soil conductivity, geography of the area and impulse noise from electric rail and powerlines.

This paper identifies options to enable the use of additional high-power/wide-coverage FM frequencies in the Perth RA1 licence area. Our initial engineering assessment has identified up to 5 additional high-power/wide-coverage frequencies that could be used to convert existing radio services from AM to FM and/or to allocate new commercial, national, community or narrowcasting services.

To achieve this outcome, some existing FM services in Perth would need to be replanned (that is, change frequency), so that new frequencies suitable for high-power operation fall in the most appropriate part of the FM band to manage interference. In addition, the availability of 2 of the potential 5 additional FM frequencies relies upon making suitable arrangements for the FM repeaters currently operated by or potentially planned for 2 Perth AM commercial broadcasters – 6IX and 6PR. Depending on the possible arrangements, up to 5 additional high-power/wide-coverage FM frequencies in the Perth RA1 licence area plan (LAP) could be made available.

We are seeking comments on 5 planning options identified for the potential replanning of the FM broadcasting services band in the Perth RA1 licence area, specified in the Licence Area Plan – Perth Radio.[[2]](#footnote-3) The options allow for different arrangements for FM services, with varying levels of impact on other services and required changes:

**Option 1**:Convert to FM both commercial services (6IX and 6PR) and the national ABC AM services (6PB, 6WF and 6RN).

**Option 2**:Convert to FM the 3 national ABC AM services (6PB, 6WF and 6RN) only. Under this option, the commercial AM services would not convert to FM.

**Option 3**: Convert to FM both commercial AM services (6IX and 6PR) and plan (and subsequently allocate licences for) 3 new high-power FM services in the Perth licence area for commercial radio broadcasting, national radio broadcasting and/or open narrowcasting services. Under this option, the ABC AM services would not convert to FM.

**Option 4**:Convert to FM one of the 3 national ABC AM services (6PB, 6WF or 6RN). Under this option, the other 2 national ABC AM services and the commercial AM services (6IX and 6PR) would not convert to FM. This option would minimise changes to the existing services.

**Option 5**:Plan (and subsequently allocate licences for) 3 new high power FM services in the Perth LAP for commercial radio broadcasting, national radio broadcasting, community broadcasting and/or open narrowcasting services. Under this option, the ABC and commercial AM services would not convert to FM.

**Assessment of options**

Option 1 is intended to resolve the longstanding issues for existing services regarding the poor AM reception in the Perth area due to its adverse environmental conditions for AM propagation and impulse noise from electric rail and powerlines. It will better utilise the radiocommunications spectrum by using all 5 identified additional high-power/wide-coverage frequencies. However, we acknowledge that this option would require a number of consequential changes to other services in the area and the business impact to these services must be considered.

Option 4 is identified as having the least impact and would minimise the number of changes to existing services.

Each of the other options explore to differing degrees the opportunities to achieve changes for national, commercial and/or community broadcasting licensees.

We note that each of the options requires changes (of varying degrees) to transmission towers or frequencies, which are likely to incur some costs for affected broadcasters. For this reason, it is important that there is licensee agreement about the proposed changes.

The submissions to this options paper will inform the ACMA’s further decisions regarding replanning the FM broadcasting services band in the Perth RA1 licence area. This could lead to the ACMA consulting on a formal variation the Perth RA1 licence area plan.

# Issues for comment

We welcome comments from interested stakeholders on the issues raised in this paper, or on any other issues relevant to replanning FM spectrum in the Perth RA1 licence area.

Details on making a submission can be found at [Invitation to comment](#_Invitation_to_comment) at the end of this document.

# Introduction

## Background

The Perth RA1 licence area is a unique planning environment due to the availability of spectrum, its geography, the adverse environmental conditions for AM propagation and impulse noise from electric rail and powerlines. The AM radio services in Perth have long experienced reception problems due to poor ground conductivity. The soil in Perth is essentially sand, which impedes groundwave propagation of AM signals. For many years, the ABC and the 2 commercial AM broadcasters have sought a solution to the poor AM reception in Perth. The full use of FM broadcasting services band in Perth was constrained by presence of VHF Band II analog TV on channels 3 and 5 in Bunbury. These channels have not been used for television since the switchover to digital TV in 2013, creating an opportunity to make additional wide-coverage FM frequencies available in Perth.

## Planning of broadcasting services

The ACMA’s broadcasting planning functions are set out in Part 3 of the *Broadcasting Services Act 1992* (the BSA). In performing its planning functions, the ACMA must promote the objects of the BSA (section 3), including the economic and efficient use of radiofrequency spectrum. The ACMA must also consider the planning criteria set out in section 23 of the BSA. When planning broadcasting services, the ACMA refers to its *General Approach to Analog Planning*[[3]](#footnote-4), which provides an overview of the regulatory framework, policy objectives and planning process for analog broadcasting services.

## Identification of additional high-power/wide-coverage frequencies

The frequency arrangements for FM broadcasting services in the Perth area have evolved over time. They have been significantly constrained by the historical need to share the band with Bunbury VHF Band II television services on channel 3 (85–92 MHz) and channel 5 (101–108 MHz). These channels overlap the lower and upper parts of the FM radio band, respectively.

The current FM band plan has a block of high-power/wide-coverage national, commercial and community services with effective radiated power (ERP) levels of typically 100 kW, 40 kW or 16 kW, respectively, on FM broadcast frequencies between 92.1 and 100.9 MHz. Lower-powered community and high-power open narrowcasting (HPON) services have been accommodated on either side of this central block of frequencies in the spectrum that was formerly used by channel 3 and channel 5 television services.

The switch-off of analog TV in 2013 resulted in an opportunity to make additional high-power/wide-coverage FM frequencies available in the Perth RA1 licence area.

We have performed an engineering analysis to identify options for replanning the frequency arrangements for FM broadcasting services and make additional high-power/wide-coverage FM frequencies available in the Perth area. Each option aims to enable efficient FM spectrum use while minimising required changes to the existing services in the Perth licence area or surrounding areas.

Five additional high-power/wide-coverage FM frequencies have been identified for potential use in the Perth RA1 licence area. However, depending on the possible arrangements, up to 5 additional high-power/wide-coverage FM frequencies in the Perth RA1 licence area can be made available. These frequencies could be used for a variety of purposes, including new commercial, national, community or narrowcasting services. The frequencies could alternatively be used for the conversion of existing broadcasting services from AM to FM – Figure 1 depicts the potential arrangement.

The possible replanning of the Perth RA1 licence area would require several changes, some of which are interdependent. The required changes are detailed in the *Engineering analysis outcomes* section.

The availability of 2 of the potential additional FM frequencies relies upon making suitable arrangements for the 6IX and 6PR FM repeaters.

1. Perth FM replanning: 5 potential new FM frequencies (the relative heights indicate different power levels but are not to scale)



103.3

104.9

104.1

104.1

102.5

91.3

# Engineering analysis

## Objective

Our engineering analysis aimed to identify potential frequencies that could be suitable for high-power/wide-coverage services in the Perth licence area while minimising changes to, or impacts on, the existing services in the Perth licence area or surrounding areas.

The analysis identified potential high-power/wide-coverage omni-directional (OD) antenna pattern services (notionally for national services) and directional antenna (DA) pattern services (notionally for commercial services). In practice, the planning constraints on each of the channels will be similar so the frequencies will, most likely, be interchangeable and could also be used for community services or HPONs in addition to commercial or national services.

## Planning approach/assumptions

As a starting point, it was assumed that that all services, and especially high-power services, would be planned on an 800 kHz raster.[[4]](#footnote-5)

When using an 800 kHz raster, there is potential for adjacent channel interference between non-co-sited high-power wide-coverage and local services that cover licence areas that fall inside the Perth RA1 licence area. Because there are several non-co-sited transmitters with overlapping coverage areas within the Perth area, the planning approach:

Organises all high-power/wide-coverage services into a single block (to minimise high-power to adjacent low-power interference).

* Places 40 kW ERP directional services[[5]](#footnote-6) (rather than 100 kW OD services) at the edge of the block of high-power services to ease 800 kHz adjacent compatibility with HPON or low-powered community services that are adjacent to the high-power block.

The study modelled a notional 100 kW omni-directional FM service from the Broadcast Australia tower at Bickley using an antenna pattern based on the 6ABCFM/6JJJ antenna with an antenna height of 120 metres AGL. A notional 40 kW directional service was modelled on an existing FM service transmitted from the FM antenna array on the mast at the TXA site Bickley (an RFS 904CP-8B 4-bay, 2-sided panel array, with the panels pointing at 265°T and 355°T) with an antenna height of 105 metres. The coverage of the notional high-power services was equivalent to the coverage of the existing FM services. The draft technical specifications can be found in Appendix A.

## Engineering analysis outcomes

The engineering analysis has identified frequencies for up to 5 high-power/wide-coverage FM services in the Perth RA1 licence area (details on these frequencies are listed below). The availability of these frequencies is subject to some consequential changes affecting existing services.

### 102.5 MHz: high-power 100 kW omni-directional FM service

To make this frequency available:

The Kalamunda 6KCR community 102.5 MHz frequency needs to be vacated before other changes can be made. It is assumed the Kalamunda 6KCR community service will change its frequency from 102.5 MHz to 88.9 MHz.

The Perth 6SEN community 101.7 MHz service needs to relocate from its current Ardross site to a new site at Bickley and increase ERP from 8 kW to 16 kW. This will minimise the potential interference to 6SEN service in the vicinity of the transmission towers. These potential interference concerns could be resolved, or substantially reduced, if the 6SEN service operated from the same site (or failing that, at a nearby site) as the potential Perth 100 kW service.

The Lancelin 6FMS commercial service needs to move from 102.3 MHz to 102.9 MHz to minimise potential interference to the fringes of the Lancelin coverage and the potential high-power service.

The 102.5 MHz Leeman 6FMS commercial service will be allowed to increase ERP from 30 W to 50 W to minimise co-channel interference affecting the perimeter of the Leeman coverage area.

This would allow a high-power/wide-coverage service up to 100 kW OD to be made available on 102.5 MHz.

### 103.3 MHz: high-power 100 kW omni-directional FM service

To make this frequency available:

The Perth City HPON needs to move from 103.3 MHz to 106.5 MHz as it cannot operate on the same frequency as the potential high-power service.

This would allow a high-power/wide-coverage service up to 100 kW OD to be made available on 103.3 MHz.

### 104.1 MHz: high-power 100 kW omni-directional FM service

To make this frequency available:

The Lancelin 6SAT commercial service needs to move from 103.9 MHz to 104.5 MHz to reduce interference to Lancelin coverage affecting fringes of the Lancelin and the potential Perth 100 kW coverage areas.

The Leeman 6SAT 104.1 MHz commercial service increases ERP from 15 W to 50 W to minimise interference affecting the perimeter of the Leeman coverage area.

This would allow a high-power/wide-coverage service up to 100 kW OD to be made available on 104.1 MHz.

### 91.3 MHz: high-power 40 kW directional FM service

This frequency has been earmarked as a ‘translator’ or infill service for the 6PR AM commercial radio service and, in practice, will not be available if the 6PR AM service is not converted to FM. To make this frequency available:

The 6WSM Fremantle community service must move from 91.3 MHz to 107.0 MHz (with the possible ERP increase from 200 W to 600 W) to reduce potential interference from 6HFM Armadale service at 107.3 MHz.

This would allow a high-power/wide-coverage service of up to 40 kW DA to be made available on 91.3 MHz.

### 104.9 MHz: high-power 40 kW directional FM service

The availability of this frequency is subject to the cessation or re-location of the FM repeaters operated by the AM commercial broadcaster 6IX. In practice, this frequency will not be available if the 6IX AM service is not converted to FM. To make this frequency available:

The 105.7 MHz Wanneroo and Rockingham 6IX commercial repeaters need to be switched off (subject to 6IX AM service converting to FM).

The Perth City HPON must move from 104.9 MHz to 105.7 MHz, with a possible ERP increase from 50 W to 200 W to minimise potential interference from the potential 40kW service.

This would allow a 40 kW DA high power/wide coverage service to be made available on 104.9 MHz.

Draft technical specifications for the potential new services and revised technical specifications are included in Appendix A.

Perth frequency replanning study outcomes for Option 1

KEY: green = community services, blue = commercial services, brown = national services, dark green = HPONs, yellow = new high-power/wide-coverage services. Crossed-out services either cease or change frequency.

****

# Replanning options

The identified frequencies could potentially be used in the conversion of existing broadcasting services from AM to FM and/or planning of new commercial, national, community or narrowcasting services. Taking into account the possible technical specifications for these frequencies and the required consequential changes, we have identified the following planning options.

## Option 1

Convert to FM the 2 commercial AM services (6IX and 6PR) and the 3 national ABC AM services (6PB, 6WF and 6RN). Under this option, the commercial services would be allocated the 91.3 MHz and 104.9 MHz frequencies to allow for new high-power/wide-coverage up to 40 kW DA services, while the ABC would be allocated the 102.5 MHz, 103.3 MHZ and 104.1 MHz frequencies to allow for new-high power/wide-coverage up to 100 kW OD services.

## Option 2

Convert to FM the 3 national ABC AM services (6PB, 6WF and 6RN) only. Under this option, the ABC will be allocated the 102.5 MHz, 103.3 MHz and 104.1 MHz frequencies to allow for new high-power/wide-coverage up to 100 kW OD services, while the commercial AM services would not change.

## Option 3

Convert to FM the 2 commercial AM services (6IX and 6PR) and plan for 3 new-high power FM services in the Perth licence area for any category or categories of broadcasting. Under this option, the commercial services would be allocated the 91.3 MHz and 104.9 MHz frequencies to allow for new high-power/wide-coverage up to 40 kW DA services, while the new services would be allocated the 102.5 MHz, 103.3 MHz and 104.1 MHz frequencies. The ABC AM services would not change.

## Option 4

To minimise the required changes to the existing services, convert to FM one of the 3 national ABC AM services (6PB, 6WF or 6RN) only. Under this option, the ABC will be allocated the 103.3 MHz frequency to allow for a new high-power/wide-coverage up to 100 kW OD service. Making the 103.3 MHz frequency available requires only one consequential frequency change (the Perth City HPON frequency change). The other 2 national ABC AM services and the commercial AM services (6IX and 6PR) would not change.

## Option 5

Plan for 3 new high-power FM services in the Perth licence area for any category or categories of broadcasting. Under this option, the new services would be allocated the 102.5 MHz, 103.3 MHZ and 104.1 MHz frequencies to allow for new high-power/wide-coverage up to 100 kW OD services, while the ABC and commercial AM services would not change.

## Options assessment

### Option 1

Converting the commercial and national services would allow for resolution of a longstanding issue regarding poor AM reception in the Perth area due to its adverse environmental conditions for AM propagation. Also, the allocation of an additional repeater(s) for the 6PR service would not be necessary.

Converting all national and commercial services to FM would also allow for full use of the identified additional high-power/wide-coverage frequencies. The availability of 2 of the identified frequencies (91.3 MHz and 104.9 MHz) is subject to the AM commercial services being converted to FM as those frequencies are already in use for, or earmarked, as ‘translator’ or infill services.

This option also aligns with our understanding of the ABC’s radio planning priorities.

### Option 2

Converting the national AM services would allow resolution of a longstanding issue regarding poor ABC AM reception in the Perth area due to its adverse environmental conditions for AM propagation.

This option also aligns with our understanding of the ABC’s radio planning priorities.

The commercial AM services would continue to operate with unresolved issues regarding poor AM reception in the Perth area due to its adverse environmental conditions for AM propagation.

### Option 3

Converting the commercial AM services would allow for the resolution of the longstanding issue regarding poor AM reception in the Perth area due to its adverse environmental conditions for AM propagation.

The national AM services would continue to operate with unresolved issues regarding poor AM reception in the Perth area due to its adverse environmental conditions for AM propagation.

### Option 4

This option allows for converting one national ABC AM service to FM with minimal changes to the existing services (a frequency change of the Perth City HPON operating on 91.1 MHz is the only requirement under this option).

The 2 remaining national services and the 2 commercial AM services would continue to operate with unresolved issues regarding poor AM reception in the Perth area due to its adverse environmental conditions for AM propagation.

### Option 5

This option would allow for new high-power services to be operated in the Perth licence area.

The national and commercial AM services would continue to operate with unresolved issues regarding poor AM reception in the Perth area due to its adverse environmental conditions for AM propagation.

### The case for change

We consider that the potential replanning of the Perth FM frequencies is an economic and efficient use of spectrum that promotes the objects in section 3 of the BSA, particularly the availability of a diverse range of radio services (paragraph 3(1)(a) of the BSA). In putting this proposal forward, we considered the planning criteria in section 23 of the BSA, especially:

relevant demographics and social and economic characteristics (paragraphs 23(a) and (b))

the number of existing broadcasting services and the demand for new services (paragraph 23(c))

the technical restraints relating to the delivery or reception of broadcasting services in the licence area (paragraph 23(e)).

Option 1 is intended to allow for the resolution of the longstanding issues regarding the poor AM reception in the Perth area due to its adverse environmental conditions for AM propagation. It would enable better utilisation of the radiocommunications spectrum by utilising all 5 identified additional high-power/wide-coverage frequencies. However, we acknowledge that implementing Option 1 would require a number of changes to the existing services and the business impact to these services has to be considered.

Option 4 is identified as the least-impact option, which minimises the number of changes to existing services.

Each of the other options explore to differing degrees the opportunities to achieve changes for national, commercial and/or community broadcasting licensees.

The diagram depicting the Perth frequency plan for Option 1 is in Figure 2.

## Additional considerations

Depending on the final outcome of this consultation process, multiple frequency changes would be necessary to accommodate Perth FM replanning. This may have a cost impact on some broadcasters. Some prior agreements between the affected parties also must be considered before the implementation of these changes.

Under any option, we consider it important that there is licensee agreement to the proposed changes, noting that each of the options requires to varying degrees changes to transmission towers or frequencies, which are likely to incur some costs for each of the affected broadcasters.

# Next steps

The outcomes of this consultation will inform the ACMA on further actions for replanning the FM broadcasting services band in the Perth RA1 licence area.

Subject to the outcomes of this consultation, we will consult again on the possible technical proposal for the Perth replanning as a basis for a subsequent LAP variation(s).

# Invitation to comment

## Making a submission

We invite comments on the identified planning options for replanning the FM broadcasting services band in the Perth RA1 licence area set out in this options paper.

[Online submissions](http://www.acma.gov.au/theACMA/Consultations/Consultations) can be made by uploading a document. Submissions in PDF, Microsoft Word or Rich Text Format are preferred.

Submissions by post can be sent to:

The Manager

Broadcast Spectrum Planning Section

Australian Communications and Media Authority

PO Box 78

Belconnen ACT 2616

The closing date for submissions is COB, **Monday 21 June 2021**.

Consultation enquiries can be emailed to broadcastplanning@acma.gov.au.

#### Publication of submissions

We publish submissions on our website, including personal information (such as names and contact details), except for information that you have claimed (and we have accepted) is confidential.

Confidential information will not be published or otherwise released unless required or authorised by law.

#### Privacy

View information about our policy on the [publication of submissions](https://www.acma.gov.au/publication-submissions), including collection of personal information during consultation and how we handle that information.

Information on the *Privacy Act 1988,* how to access or correct personal information, how to make a privacy complaint and how we will deal with any complaints, is available in our [privacy policy](https://www.acma.gov.au/privacy-policy).

# Appendix A: Draft technical specifications (TS)

|  |  |
| --- | --- |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | **100 kW OD service (notionally suitable for a national service)** |
| Area Served | **Perth** |
| Nominal location | **Tower Broadcast Australia Site Television Road BICKLEY** |
| RADCOM Site ID | **26620** |
| Coordinates Information | **Latitude (GDA94)****-32.01073** | **Longitude (GDA94)****116.08452** |
| **Zone (AMG66)****50** | **Easting (AMG66)****413397** | **Northing (AMG66)****6457863** |
| Frequency | **102.5 MHz**  |
| Output Radiation Pattern | **Azimuth Bearing (clockwise direction)** | **Maximum ERP**  |
| **At all angles of azimuth** |  **100 kW** |
| Polarisation | **Mixed** |
| Maximum Antenna Height | **120 metres[[6]](#footnote-7)** |
| Special Conditions/Advisory Notes | **Availability of TS (this TS): TS (this TS) is only available once (a) the transmitter authorised under TS10002393 in the Remote Western Australia LAP which operates on 102.3 MHz to serve Lancelin ceases operation on that frequency and (b) the transmitter authorised under TS** **10010199 in the Perth Radio LAP which operates on 102.5 MHz to serve Kalamunda ceases operation on that frequency.** |

|  |  |
| --- | --- |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | **100 kW OD service (notionally suitable for a national service)** |
| Area Served | **Perth** |
| Nominal location | **Tower Broadcast Australia Site Television Road BICKLEY** |
| RADCOM Site ID | **26620** |
| Coordinates Information | **Latitude (GDA94)****-32.01073** | **Longitude (GDA94)****116.08452** |
| **Zone (AMG66)****50** | **Easting (AMG66)****413397** | **Northing (AMG66)****6457863** |
| Frequency | **103.3 MHz**  |
| Output Radiation Pattern | **Azimuth Bearing (clockwise direction)** | **Maximum ERP**  |
| **At all angles of azimuth** |  **100 kW** |
| Polarisation | **Mixed** |
| Maximum Antenna Height | **120 metres[[7]](#footnote-8)** |
| Special Conditions/Advisory Notes | **Availability of TS (this TS): TS (this TS) is only available once (a) the transmitter authorised under TS** **10010301 in the Perth Radio LAP which operates on 103.3 MHz to serve Perth City ceases operation on that frequency.** |

|  |  |
| --- | --- |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | **100 kW OD service (notionally suitable for a national service)OR40 kW DA service if 104.9 MHz not made available for a high power service** |
| Area Served | **Perth** |
| Nominal location | **Tower Broadcast Australia Site Television Road BICKLEY** |
| RADCOM Site ID | **26620** |
| Coordinates Information | **Latitude (GDA94)****-32.01073** | **Longitude (GDA94)****116.08452** |
| **Zone (AMG66)****50** | **Easting (AMG66)****413397** | **Northing (AMG66)****6457863** |
| Frequency | **104.1 MHz**  |
| Output Radiation Pattern | **Azimuth Bearing (clockwise direction)** | **Maximum ERP**  |
| **At all angles of azimuth** |  **100 kW** |
| Polarisation | **Mixed** |
| Maximum Antenna Height | **120 metres[[8]](#footnote-9)** |
| Special Conditions/Advisory Notes | **Availability of TS (this TS): TS (this TS) is only available once the transmitter authorised under TS10002394 in the Remote Western Australia LAP which operates on 103.9 MHz to serve Lancelin ceases operation on that frequency.** |

|  |  |
| --- | --- |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | **Notional commercial service (nominally for 6PR)** |
| Area Served | **Perth** |
| Nominal location | **FM Mast TXA Bickley Site Television Rd BICKLEY** |
| RADCOM Site ID | **26627** |
| Coordinates Information | **Latitude (GDA94)****-32.00714** | **Longitude (GDA94)****116.08395** |
| **Zone (AMG66)****50** | **Easting (AMG66)****413340** | **Northing (AMG66)****6458261** |
| Frequency | **91.3 MHz** |
| Output Radiation Pattern | **Azimuth Bearing (clockwise direction)** | **Maximum ERP**  |
| **0º T – 70º T****70º T – 180º T****180º T – 200º T****200º T – 360º T** |  **40 kW** **1 kW** **5 kW** **40 kW** |
| Polarisation | **Mixed** |
| Maximum Antenna Height | **105 metres** |
| Special Conditions/Advisory Notes | **Availability of TS (this TS): TS (this TS) is only available once the transmitter authorised under TS10010710 in the Perth Radio LAP which operates on 91.3 MHz to serve Fremantle ceases operation on that frequency.** |

Assuming that existing Technical Specifications for 6IX Wanneroo (TS10010200) and 6IX Rockingham (TS 10010930) are removed, the following TS could be added for 6IX.

|  |  |
| --- | --- |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | **Notional commercial service (nominally for 6IX)** |
| Area Served | **Perth** |
| Nominal location | **FM Mast TXA Bickley Site Television Rd BICKLEY** |
| RADCOM Site ID | **26627** |
| Coordinates Information | **Latitude (GDA94)****-32.00714** | **Longitude (GDA94)****116.08395** |
| **Zone (AMG66)****50** | **Easting (AMG66)****413340** | **Northing (AMG66)****6458261** |
| Frequency | **104.9 MHz**  |
| Output Radiation Pattern | **Azimuth Bearing (clockwise direction)** | **Maximum ERP**  |
| **0º T – 70º T****70º T – 180º T****180º T – 200º T****200º T – 360º T** |  **40 kW** **1 kW** **5 kW** **40 kW** |
| Polarisation | **Mixed** |
| Maximum Antenna Height | **105 metres** |
| Special Conditions/Advisory Notes | **Availability of TS (this TS): TS (this TS) is only available once (a) the transmitter authorised under TS10010302 in the Perth Radio LAP which operates on 104.9 MHz to serve Perth City ceases operation on that frequency; (b) the transmitter authorised under TS** **10010200 in the Perth Radio LAP which operates on 105.7 MHz to serve Wanneroo ceases operation and (c) the transmitter authorised under TS10010930 in the Perth Radio LAP which operates on 105.7 MHz to serve Rockingham ceases operation.** |

**Potential revised technical specifications**

Changed parameter values are indicated with **red bold** text.

|  |  |
| --- | --- |
| Current TS number | 10010710 |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | 6WSM |
| Area Served | Fremantle |
| Nominal location | Community Radio Broadcast Site View Tce EAST FREMANTLE |
| RADCOM Site ID | 151225 |
| Coordinates Information | Latitude (GDA94)-32.03327 | Longitude (GDA94)115.77060 |
| Zone (AMG66)50 | Easting (AMG66)383775 | Northing (AMG66)6455070 |
| Frequency | **107.0 MHz**  |
| Maximum ERP and Radiation Pattern | Azimuth Bearing (clockwise direction) | Maximum ERP |
| At all angles of azimuth |  **600 W** |
| Polarisation | Vertical |
| Maximum Antenna Height | 20 metres |
| Special Conditions/Advisory Notes | None |

|  |  |
| --- | --- |
| Current TS number | 10010302 |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | HPON  |
| Area Served | Perth City |
| Nominal location | Nominal Planning site Adj Reservoir McDonald St JOONDANNA |
| RADCOM Site ID | 132270 |
| Coordinates Information | Latitude (GDA94)-31.90690 | Longitude (GDA94)115.83873 |
| Zone (AMG66)50 | Easting (AMG66)390058 | Northing (AMG66)6469150 |
| Frequency | **106.5 MHz**  |
| Maximum ERP and Radiation Pattern | Azimuth Bearing (clockwise direction) | Maximum ERP  |
| At all angles of azimuth |  50 W |
| Polarisation | Vertical |
| Maximum Antenna Height | 20 metres |
| Special Conditions/Advisory Notes | AN: The coverage area of this transmission is defined as that area within a radius of 7 kilometres measured from a point with the following AMG co-ordinates: Zone 50; Easting 390058; Northing 6469150. This point is the same as the nominal transmitter site. |

|  |  |
| --- | --- |
| Current TS number | 10010301 |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | HPON  |
| Area Served | Perth City |
| Nominal location | Nominal Planning site Adj Reservoir McDonald St JOONDANNA |
| RADCOM Site ID | 132270 |
| Coordinates Information | Latitude (GDA94)-31.90690 | Longitude (GDA94)115.83873 |
| Zone (AMG66)50 | Easting (AMG66)390058 | Northing (AMG66)6469150 |
| Frequency | **105.7 MHz**  |
| Maximum ERP and Radiation Pattern | Azimuth Bearing (clockwise direction) | Maximum ERP  |
| At all angles of azimuth |  **200 W** |
| Polarisation | Vertical |
| Maximum Antenna Height | 20 metres |
| Special Conditions/Advisory Notes | AN: The coverage area of this transmission is defined as that area within a radius of 7 kilometres measured from a point with the following AMG co-ordinates: Zone 50; Easting 390058; Northing 6469150. This point is the same as the nominal transmitter site. |

|  |  |
| --- | --- |
| Current TS number | 10002391 |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | 6SAT  |
| Area Served | Leeman |
| Nominal location | Broadcast Site South of Thomas St LEEMAN |
| RADCOM Site ID | 30650 |
| Coordinates Information | Latitude (GDA94)-29.95167 | Longitude (GDA94)114.97664 |
| Zone (AMG66)50 | Easting (AMG66)304600 | Northing (AMG66)6684700 |
| Frequency | 104.1 MHz  |
| Maximum ERP and Radiation Pattern | Azimuth Bearing (clockwise direction) | Maximum ERP  |
| At all angles of azimuth |  **50 W** |
| Polarisation | Vertical |
| Maximum Antenna Height | 15 metres |
| Special Conditions/Advisory Notes | None |

|  |  |
| --- | --- |
| Current TS number | 10002390 |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | 6FMS  |
| Area Served | Leeman |
| Nominal location | Broadcast Site South of Thomas St LEEMAN |
| RADCOM Site ID | 30650 |
| Coordinates Information | Latitude (GDA94)-29.95167 | Longitude (GDA94)114.97664 |
| Zone (AMG66)50 | Easting (AMG66)304600 | Northing (AMG66)6684700 |
| Frequency | 102.5 MHz  |
| Maximum ERP and Radiation Pattern | Azimuth Bearing (clockwise direction) | Maximum ERP  |
| At all angles of azimuth |  **50 W** |
| Polarisation | Vertical |
| Maximum Antenna Height | 15 metres |
| Special Conditions/Advisory Notes | None |

|  |  |
| --- | --- |
| Current TS number | 10002393 |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | 6FMS  |
| Area Served | Lancelin |
| Nominal location | Council Site off Nilgen Rd NILGEN |
| RADCOM Site ID | 150533 |
| Coordinates Information | Latitude (GDA94)-30.98496 | Longitude (GDA94)115.38552 |
| Zone (AMG66)50 | Easting (AMG66)345700 | Northing (AMG66)6570800 |
| Frequency | **102.9 MHz**  |
| Maximum ERP and Radiation Pattern | Azimuth Bearing (clockwise direction) | Maximum ERP  |
| At all angles of azimuth |  150 W |
| Polarisation | Vertical |
| Maximum Antenna Height | 40 metres |
| Special Conditions/Advisory Notes | None |

|  |  |
| --- | --- |
| Current TS number | 10002394 |
| TS Number | **TS XXXXXXXXX** |
| Callsign of licensee | 6FMS  |
| Area Served | Lancelin |
| Nominal location | Council Site off Nilgen Rd NILGEN |
| RADCOM Site ID | 150533 |
| Coordinates Information | Latitude (GDA94)-30.98496 | Longitude (GDA94)115.38552 |
| Zone (AMG66)50 | Easting (AMG66)345700 | Northing (AMG66)6570800 |
| Frequency | **104.5 MHz**  |
| Maximum ERP and Radiation Pattern | Azimuth Bearing (clockwise direction) | Maximum ERP  |
| At all angles of azimuth |  150 W |
| Polarisation | Vertical |
| Maximum Antenna Height | 40 metres |
| Special Conditions/Advisory Notes | None |

1. Australian Communications and Media Authority, [*The future delivery of radio*](https://www.acma.gov.au/publications/2020-03/report/future-delivery-radio) [webpage], ACMA website, March 2020, accessed 20 April 2021. [↑](#footnote-ref-2)
2. Australian Government, [Licence Area Plan – Perth Radio](https://www.legislation.gov.au/Details/F2017C01134) [webpage], Federal Register of Legislation website, n.d., accessed 20 April 2021. [↑](#footnote-ref-3)
3. ACMA, [*General Approach to Analog Planning*](https://www.acma.gov.au/publications/2003-09/guide/general-approach-analog-planning), ACMA website, 2003, accessed 20 April 2021. [↑](#footnote-ref-4)
4. Australian Broadcasting Authority, [*Technical Planning Parameters and Methods for Terrestrial Broadcasting*](https://www.acma.gov.au/publications/2004-04/guide/technical-planning-parameters-and-methods-terrestrial-broadcasting-tpps), ACMA website, April 2004, accessed 20 April 2021. [↑](#footnote-ref-5)
5. Frequencies identified for a 40 kW DA service could alternatively be used for a 16 kW directional service (for example, community or HPON). [↑](#footnote-ref-6)
6. While current Technical Specifications for national services on the Broadcast Australia Tower at Bickley (TS 6891001 and TS3028601) have a Maximum Antenna height specification of 97 m, it is understood that the current FM array has an electrical centre height of approximately 120 m. [↑](#footnote-ref-7)
7. While current technical specifications for national services on the Broadcast Australia Tower at Bickley (TS 6891001 and TS3028601) have a maximum antenna height specification of 97 m, it is understood that the current FM array has an electrical centre height of approximately 120 m. [↑](#footnote-ref-8)
8. While current technical specifications for national services on the Broadcast Australia Tower at Bickley (TS 6891001 and TS3028601) have a maximum antenna height specification of 97 m, it is understood that the current FM array has an electrical centre height of approximately 120 m. [↑](#footnote-ref-9)