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Australian Communications and Media Authority

# Engineering Report

# Restack Channel Planning

## Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA

ENGINEERING REPORT TPS2011/07

DECEMBER 2011

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Published by the Australian Communications and Media Authority

# Executive summary

This Engineering report accompanies, and is intended to be read with, documentation related to the draft Television Licence Area Plans (TLAPs) for Regional Victoria, Mildura/Sunraysia, and Griffith and the Murrumbidgee Irrigation Area (MIA). It provides background explanations for the proposed channel block identifications and channel allotments for broadcast sites in the Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA licence areas. To provide a complete view of the constraints influencing channel block selection the scope of this engineering report also includes retransmission sites and in-band link (IBL) sites.

The proposed channel allotments and block identifications are discussed in detail in Section 2 of the report, and are summarised in tables on the following pages. The proposed block identifications and channel allotments follow the restack planning principles unless specifically noted, and are based around the indicative channel plan for “key sites” around Australia, developed by the ACMA and broadcasters through the Restack Planning Advisory Group (RPAG).

Section 3 of the report provides a discussion on implementation sequencing constraints that may need to be shown as events or circumstances in the TLAP.

The analysis in this report has identified that the restack of Regional Victoria sites will need to occur in two parts. Those parts will be defined by “restack windows” which will define the time period in which each part of the implementation work should occur. For the bulk of the Regional Victoria TV1 licence area, as well as the Mildura/Sunraysia and Griffith and the MIA licence areas, the first restack window would apply, and is proposed as 1 October 2012 to 28 June 2013. For several sites in the markets in which Bendigo (Mt Alexander), Murray Valley (Goschen) and Latrobe Valley (Mt Tassie) are the main stations, as well as sites on Victoria’s Surf Coast, a second restack window will apply due to constraints caused by Melbourne analog and digital UHF services. It is proposed that the second restack window would commence at 28 January 2014 and extend to 30 September 2014.

# Proposed channel allotments

The tables below summarise the proposed channel allotments which will be included in the related draft TLAP instruments.

Where sites have a mixture of broadcaster and proposed retransmission services,[1] the site will be included in the TLAP but the retransmission services, or potential future retransmission services, have been identified with an asterisk (*). Channels proposed to be allotted in the draft TLAP for currently operating services that will be restacked are identified by ( ).

Sites shown in rows with grey shading have all retransmission services. These services are not expected to be included in the TLAP instruments; however, they have been taken into account in channel planning for the TLAP.

| General area served | Block | SBS | ABC | AMV/AMN PTV | VTV/MTN /STV | BCV/GLV/ MDN/MDV | UA |
|---|---|---|---|---|---|---|---|
| MILDURA/SUNRAYSIA | | | | | | | |
| MILDURA/SUNRAYSIA | A | (28) 8 | 11 | (31) 6 | 7 | (33) 10 | 12 |
| Robinvale | C | (51) 34 | (46) 35 | 37 | (41) 36 | (43) 38 | 39 |
| Ouyen | D | (51) 45 | (46) 44 | (37) 42 | 41 | 43 | 40 |
| Underbool | C | (69) 34 | (66) 35 | (57) 36 | (60) 37 | (63) 38 | 39 |
| NORTH-WESTERN VICTORIA | | | | | | | |
| MURRAY VALLEY | E | (59) 46 | (58) 47 | (62) 48 | (60) 49 | (65) 50 | 51 |
| Balranald | D | 43* | 40 | (37) 42 | (56) 44 | 41 | 45 |
| Hopetoun (VIC) | B | 29* | 33* | 28 | (36) 30 | (33) 31 | 32 |
| Hopetoun-Beulah[2] | B | | (34) 33 | | | | |
| Birchip | D | (69) 40 | (68) 41 | (53) 42 | (52) 43 | (55) 44 | 45 |
| Wycheproof | D | (69) 40 | (68) 41 | (53) 42 | (52) 43 | (55) 44 | 45 |
| Charlton | D | (69) 40 | (68) 41 | (53) 42 | (52) 43 | (55) 44 | 45 |
| Koondrook/Barham | E | (69) 46 | (68) 47 | (53) 48 | (52) 49 | (55) 50 | 51 |
| Cohuna | D | (59) 40 | (58) 41 | (62) 42 | (60) 43 | (65) 44 | 45 |
| SOUTH-WESTERN VICTORIA | | | | | | | |
| WESTERN VICTORIA | A | 7 | 6 | 12 | 10 | (9A) 11 | 8 |
| Horsham | D | (49) 40 | (55) 41 | (53) 42 | (52) 43 | (56) 44 | 45 |
| Nhill | E | (67) 46 | (66) 47 | (61) 48 | (63) 49 | (64) 50 | 51 |
| Casterton | D | 40* | (54) 41 | (63) 42 | (66) 43 | (60) 44 | 45 |
| Coleraine[2] | E | | (42) 47 | | | | |
| Portland | D | (68) 40 | (59) 41 | (65) 42 | (56) 43 | (62) 44 | 45 |
| Warrnambool (Tower Hill) | E | (53) 47 | 50 | 51 | (45) 49 | 48 | 46 |
| Warrnambool City | B | (68) 28 | (59) 29 | (65) 30 | (56) 31 | (62) 32 | 33 |
| CENTRAL-WESTERN VICTORIA | | | | | | | |
| BENDIGO | B | 28 | (48) 29 | 31 | (54) 30 | (51) 33 | 32 |

1 This includes retransmission services that may be provided by RBA Holdings Pty Ltd (a company operated by regional commercial broadcasters) or by a local council or community organisation.

2 Site transmitting only an ABC digital broadcast service, or only ABC and SBS digital broadcast services.

| General area served | Block | SBS | ABC | AMV/AMN PTV | VTV/MTN /STV | BCV/GLV/ MDN/MDV | UA |
|---|---|---|---|---|---|---|---|
| BALLARAT | C | (43) 34 | (41) 35 | (46) 36 | 37 | (40) 38 | 39 |
| Warracknabeal | B | (67) 28 | (61) 29 | (63) 30 | (66) 31 | (64) 32 | 33 |
| Halls Gap | E | 46* | (54) 47 | (63) 48 | (57) 49 | (60) 50 | 51 |
| Waubra | E | (57) 46 | (56) 47 | (55) 48 | (53) 49 | 50 | 51 |
| Learmonth (VIC) | E | (57) 46 | (56) 47 | (55) 48 | (53) 49 | 50 | 51 |
| Ballarat East | D | (55) 40 | (67) 41 | (64) 42 | (58) 43 | (61) 44 | 45 |
| Colac | E | (53) 46 | (52) 47 | 51 | 48 | 50 | 49 |
| Cobden | D | (68) 40 | (59) 41 | (65) 42 | (56) 43 | (62) 44 | 45 |
| Terang | C | (43) 34 | (41) 35 | (46) 36 | 37 | (40) 38 | 39 |
| Timboon | B | (66) 28 | (63) 29 | (69) 30 | (57) 31 | (60) 32 | 33 |
| Lorne | C | (69) 34* | (58) 35 | (67) 36* | (64) 37* | (66) 38* | 39 |
| Mt Cowley IBL | E | (69) 46 | | (67) 47 | (64) 48 | (66) 49 | |
| Apollo Bay | E | (69) 46* | (54) 47 | (67) 48* | (64) 49* | (66) 50* | 51 |
| Tanybryn IBL | E | (69) 46 | | (67) 48 | (64) 49 | (66) 50 | |
| CENTRAL-EASTERN VICTORIA | | | | | | | |
| GOULBURN VALLEY | C | 36 | 37 | (45) 34 | (9) 35 | (42) 38 | 39 |
| Deniliquin | D | (50) 40 | (55) 41 | (47) 42 | (61) 43 | (64) 44 | 45 |
| Jerilderie | D | (60) 40 | (55) 41 | (63) 42 | (57) 43 | (66) 44 | 45 |
| Broadford | E | (67) 46 | (68) 47 | (61) 48 | (58) 49 | (64) 50 | 51 |
| Seymour | D | (66) 40 | (53) 41 | (60) 42 | (57) 43 | (63) 44 | 45 |
| Yea | C | 37 | 34 | (46) 35 | (40) 36 | (43) 38 | 39 |
| Alexandra | E | (67) 46 | (60) 47 | (64) 48 | (63) 49 | (61) 50 | 51 |
| Alexandra Environs[2] | D | (29) 42 | (32) 41 | | | | |
| Eildon | C | 37 | 34 | (46) 35 | (40) 36 | (43) 38 | 39 |
| Eildon Town[2] | D | (53) 42 | (58) 41 | | | | |
| Bonnie Doon | B | 29 | 32 | 33 | (35) 31 | 30 | 28 |
| Mansfield | E | (67) 46 | (60) 47 | (64) 48 | (63) 49 | (61) 50 | 51 |
| Howqua | C | (28) 35* | (31) 36* | 37 | 34 | 38 | 39 |
| NORTH-EASTERN VICTORIA | | | | | | | |
| UPPER MURRAY | A | 7 | (9A) 11 | 12 | 10 | 8 | 6 |
| Albury North | B | 29 | 31 | (58) 28 | (61) 30 | (64) 32 | 33 |
| Kiewa | D | (36) 40 | 41 | 44 | (46) 42 | (47) 43 | 45 |
| Mt Stanley IBL | D | | | (51) 43 | 44 | (48) 41 | |
| Myrtleford | E | (58) 46 | (53) 47 | (54) 49 | (61) 48 | (64) 50 | 51 |
| Kiewa Valley | C | | | (50) 39 | (67) 37 | (55) 38 | |
| Bright | B | 28 | 31 | (34) 29 | (40) 30 | (36) 32 | 33 |
| Tawonga South | B | 28* | 31 | (34) 29 | (40) 30 | (45) 32 | 33 |
| Harrietville | E | (58) 46 | (55) 47 | (67) 48 | (61) 49 | (64) 50 | 51 |
| Falls Creek | D | (65) 40 | (56) 41 | (62) 42 | (59) 43 | (68) 44 | 45 |
| Hunters Knob IBL | D | | | (51) 43 | (45) 44 | (48) 41 | |
| Corryong | C | 39* | (32) 36 | 37 | (40) 38 | 34 | 35 |

| General area served | Block | SBS | ABC | AMV/AMN PTV | VTV/MTN /STV | BCV/GLV/ MDN/MDV | UA |
|---|---|---|---|---|---|---|---|
| Walwa/Jingellic | C | 34* | (55) 35* | (58) 36 | (61) 37 | (64) 38 | 39 |
| Khancoban | E | 50 | (59) 46 | (53) 47 | (62) 48 | (65) 49 | 51 |
| GIPPSLAND | | | | | | | |
| LATROBE VALLEY | B | 30 | (42) 29 | 33 | (36) 31 | (39) 28 | 32 |
| Trafalgar/Yarragon | D | (55) 40 | (67) 41 | (58) 42 | (61) 43 | (64) 44 | 45 |
| Newborough | D | (55) 40 | (67) 41 | (58) 42 | (61) 43 | (64) 44 | 45 |
| Boolarra | E | 51 | 49 | (67) 46 | 50 | (53) 47 | 48 |
| Jeeralang/Yinnar South | E | 51 | 49 | (67) 46 | 50 | (53) 47 | 48 |
| Churchill | E | 51 | 49 | (67) 46 | 50 | (53) 47 | 48 |
| Foster | D | (59) 40 | (56) 41 | (62) 42 | (65) 43 | (53) 44 | 45 |
| Inverloch | E | (59) 46 | (56) 47 | (62) 48 | (65) 49 | (53) 50 | 51 |
| Bairnsdale | C | (52) 34 | (56) 35 | (59) 36 | (62) 37 | (65) 38 | 39 |
| Bruthen[2] | E | (28) 46 | (38) 47 | | | | |
| Lakes Entrance | E | (58) 46 | (61) 47 | (64) 48 | (67) 49 | (53) 50 | 51 |
| Nowa Nowa[2] | B | | (51) 29 | | | | |
| Orbost | D | 42* | (37) 41 | 43 | 44 | (38) 40 | 45 |
| Cann River | E | 46* | (12) 47 | (53) 49 | (55) 48 | (9A) 50 | 51 |
| Genoa | C | 35* | (30) 36 | 39 | (44) 37 | (33) 38 | 34 |
| Mallacoota | E | 46* | (56) 47 | (62) 48 | (65) 49 | (59) 50 | 51 |
| GRIFFITH AND MIA | | | | | | | |
| MURRUMBIDGEE IRRIGATION AREA | B | 33 | (11) 28 | 30 | (6) 29 | 32 | 31 |
| Hay | D | (61) 40 | (55) 41 | 42 | (56) 43 | 44 | 45 |
| Hillston | D | 40 | 41 | 42 | 43 | 44 | 45 |

# 1 Introduction

## 1.1 Scope

This report should be read in conjunction with the draft TLAPs for Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA, the associated discussion/explanatory papers and the related planning documents which contain the detailed transmitter specifications consistent with the parameters assumed in conducting predictions of signal levels as part of the planning process.

The legislative and regulatory background of the relevant TLAPs is discussed in the Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA TLAP discussion paper.

The Regional Victoria TV1 licence area consists of two parts: Western Victoria and Eastern Victoria. Western Victoria consists of the markets in which Murray Valley (Goschen), Western Victoria (Mt Dundas), Ballarat (Lookout Hill) and Bendigo (Mt Alexander) are the main stations. Eastern Victoria consists of the markets in which Goulburn Valley (Mt Major), Upper Murray (Mt Baranduda) and Latrobe Valley (Mt Tassie) are the main stations.

In the Mildura/Sunraysia licence area, the main station is Mildura/Sunraysia (Yatpool), with three repeater stations.

In the Griffith and the MIA licence area, the main station is Murrumbidgee Irrigation Area (Mt Bingar), with two repeater stations.

The digital switchover timetable set Mildura/Sunraysia as the first licence area to switch-over to digital in 30 June 2010. Areas in the Regional Victoria licence area followed on 5 May 2011. The Griffith and the MIA licence area will switch-over with other Southern NSW markets on 5 June 2012. The Melbourne TV1 licence area will complete its analog switchover in the second half of 2013. The implementation of restack at some sites in Regional Victoria cannot occur before Melbourne switchover and/or restack of some Melbourne sites.

This engineering report provides supporting engineering information to explain the choice of channels at sites to be included in the Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA TLAPs. To provide a complete view of the constraints influencing channel block selection, the scope of this engineering report also includes sites used to provide in-band links and sites providing retransmission services (both those operated by RBA Holdings Pty Ltd, and those operated by councils or other community organisations).

The report also analyses the constraints that affect the timing of the move to final restack channels. This information is used in determining the timing window(s) for the period within which the transition to final digital channels must occur.

## 1.2 Background to channel block identification for sites in Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA

The planning principles that underpin the identification of blocks and allotment of channels have been the subject of extensive consultation (discussion at the Restack Planning Advisory Group (RPAG)) and then a formal public consultation. Feedback on the proposed restack objectives was broadly positive and supportive of the proposed planning objectives. In its analyses that led to the decision to incorporate the Block planning approach in its *Planning Principles*, the ACMA undertook an extensive

comparative analysis of two alternative planning approaches and eventually adopted the Block approach over the alternative Minimum Moves approach.

The development of the channel plans in this report followed a top-down approach. That is to say, high power sites and other sites serving large populations were considered first and the most suitable channel blocks for those key sites were identified. After that, more detailed region-by-region analyses were performed to determine channel blocks for the repeater sites in each region.

Within the RPAG a collaborative process was undertaken to develop an indicative channel plan for "key sites" around Australia. The key sites indicative channel plan is important for the development of Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA channel plans because that process requires consideration of adjacent licence areas; namely Melbourne, Renmark/Loxton, Mt Gambier/South East, Southern NSW and to some extent, Tasmania. Discussions at the RPAG-3 meeting of June 2011 and the RPAG-Working Group meeting of July 2011 led to consensus on the channel blocks to be used for the majority of these sites. The high power sites within Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA are discussed in Section 2.2.

**Table 1—Key sites neighbouring Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA**

| Site (Area Served) | Polarisation | ERP | Estimate of population best served | Proposed Block |
|---|---|---|---|---|
| Melbourne | H | 50 kW | 3,840,000 | A |
| Canberra | H | 50 kW | 370,000 | A |
| Cooma/Monaro | V | 100 kW | 6,000 | B |
| Central Tablelands | H | 300 kW | 100,000 | C |
| SW Slopes/E Riverina | H | 600 kW | 40,000 | E |
| Renmark/Loxton | V | 240 kW | 30,000 | B |
| South East | H | 200 kW | 50,000 | B |
| NE Tasmania | H | 1250 kW | 130,000 | D |

Metropolitan areas tend to be more congested in terms of spectrum availability. The only metropolitan area affecting arrangements in Regional Victoria is Melbourne. Studies of the Melbourne TV1 licence area show that the only Regional Victoria sites that could affect channel block selection for Melbourne TV1 repeater sites are Bendigo (Block B), Latrobe Valley (Block B), Ballarat (Block C), Broadford (Block E), Colac (Block E) and the Surf Coast sites[3].

Further details of the block identification and channel allotment at each site are discussed on a region-by-region basis in section 2.

Section 3 uses those proposed Block identifications, and knowledge of interference compatibility constraints to determine limitations or conditions that could apply to the sequence in which the restack is implemented.

**Appendix A1** provides the ACMA's Planning Principles.

**Appendix A2** provides a channel chart that summarise the proposed channel allotments as well as current analog (where applicable) and digital channels at each site.

**Appendix A3** provides colour-coded, region-by-region maps that illustrate the channel blocks identified for each transmitter site together with an indication of the location of each transmitter and an indication of its expected coverage.

[3] Lorne (Block C), Mt Cowley IBL (Block E), Apollo Bay (Block E) and Tanybryn IBL (Block E).

**Appendix A4** provides a service-by-service listing of constraints on the restacking of each service.

## 1.3 Consultation

The ACMA distributed an informal advance copy of the draft of the channel plan that underpins this report at an RPAG Working Group meeting in late September. Subsequent to that meeting feedback received from broadcasters was incorporated into a revised draft channel plan that was discussed at the RPAG Working Group meeting in November 2011, and which has now been incorporated into the proposals that are presented in this report.

## 1.4 Terminology

Block identification and channel allotments

To align with terminology being adopted in TLAP instruments, this report uses the terms 'identify' or identification' in relation to the proposed block of channels to be used to serve a particular area. The channels of the identified channel block are specified in TLAPs. The term 'allotment' is used in the TLAPs and in this engineering report in relation to which channel is to be used by which broadcaster. Some channels will remain unallotted in TLAPs and may be available for future allotment to a new service or be made available for retransmission services operated by third parties.

Call sign for ABC services

The ABC has traditionally been given a unique call sign for services from main sites and off-air fed translators and a generic state-based call sign for the main metropolitan service and satellite fed services. For example, the ABC service at Latrobe Valley has the call sign ABLV while at Melbourne the ABC has the call sign ABV. This convention has not been rigorously applied over the years and this can lead to confusion. For the purposes of consistency, in this engineering report and draft TLAP documents the call sign ABC has been used for all ABC services.

## 1.5 Transmitter Specifications

Detailed transmitter specifications for each service at each site are included in separate "Planning Data documents" for Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA. These will become "living documents" that should fairly closely reflect the actual operating conditions of all services within the planning area covered by the TLAPs. It is intended that these planning data documents will be revised from time-to-time as better information, or changes to transmitter specifications, is advised to the ACMA. Generally those specifications follow existing DCP[4] technical specifications (except for channel changes).

[4] Or licence data in the case of retransmission sites.

# 2 Block identification and channel allotment proposals

## 2.1 Background

This section of the engineering report describes how the proposed channel blocks were identified for each area and it describes the proposed channel allotments within each identified block. In addition to the normal consideration of avoiding or minimising predicted interference between services, channel allotments have been made in accordance with the ACMA's Planning Principles unless specifically noted in the discussions in this section. The Planning Principles are reproduced in **Appendix A1**.

Selection of channel blocks and channel allotments has been done in accordance with Principles 4 and 5 in all cases. The selection of channel blocks has been guided by the need to avoid interference between services and by Principle 7. Discussion on the rationale for particular block selections is included on a site-by-site basis in sections 2.2 to 2.10. Similarly, the channel allotments within each identified block generally follow Principle 6, but discussion of individual issues is also given in sections 2.2 to 2.10.

In addition to the site-by-site discussion in this section, the channel allocation proposals have also been summarised in a consolidated channel chart (that also shows current analog and digital channels) in **Appendix A2**.

## 2.2 High power sites

As mentioned in Section 1.2, ACMA staff and industry have reached consensus on channel blocks to be used at high power sites in Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA. These are listed in Table 2.

**Table 2—High power sites in Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA**

| Site (Area Served) | Polarisation | Max. licensed digital ERP | Approximate population[5] | Proposed Block |
|---|---|---|---|---|
| Ballarat | H | 500 kW | 130,000 | C |
| Bendigo | H | 895 kW | 170,000 | B |
| Goulburn Valley | H | 300 kW | 130,000 | C |
| Horsham | H | 40 kW | 20,000 | D |
| Latrobe Valley | H | 400 kW | 140,000 | B |
| Murrumbidgee Irrigation Area | V | 200 kW | 45,000 | B |
| Mildura/Sunraysia | H | 50 kW | 54,000 | A |
| Murray Valley | H | 375 kW | 30,000 | E |
| Nhill | V | 65 kW | 6,000 | E |
| Upper Murray | H | 60 kW | 140,000 | A |
| Western Victoria | H | 32 kW | 20,000 | A |

### 2.2.1 MILDURA/SUNRAYSIA Block A

Mildura/Sunraysia (Yatpool) is the main high power transmission site in the Mildura/ Sunraysia licence area.

[5] Estimated population receiving the strongest (band adjusted) predicted field strength from the corresponding transmitter site, taking account of all other sites operating in the area.

Given that two of the five currently operating Yatpool digital services operate on VHF Band III channels in Block A, it is proposed that the identified channel block for Mildura/Sunraysia should be Block A.

Murray Valley (see section 2.2.2) also had existing analog services in VHF Band III; however, it was considered that operating Mildura/Sunraysia on Block A would result in less co-channel interference to and from Melbourne and Western Victoria (Mt Dundas) which are also proposed to operate on Block A due to existing channels. Co-channel operation between Mildura/Sunraysia and Broken Hill is not predicted to result in unacceptable interference.

Proposed channel allotments for Mildura/Sunraysia follow the general guidance given in Principle 6 and are shown in Table 2.1. STV7 and ABC11 have been kept on their current channels while, consistent with Principle 6, the unallotted service has been placed on channel 10. After that, commercial services were grouped together (channels 6–8), and national services were grouped together (channels 11 and 12).

### 2.2.2 MURRAY VALLEY Block E

Murray Valley (Goschen) is the main high power transmission site in North-Western Victoria (excluding Mildura/Sunraysia, which has been treated separately).

Existing digital services operate above channel 51, and UHF analog services at Murray Valley have never operated below channel 44. Therefore, as per Principle 7, to avoid or minimise the need to change the existing UHF transmit antenna at Goschen, and to avoid issues with receive antenna arrangements, it is proposed that the identified channel block for Murray Valley should be Block E.

Proposed channel allotments for Murray Valley follow the general guidance given in Principle 6 and are shown in Table 2.2.

### 2.2.3 WESTERN VICTORIA Block A

Western Victoria (Mt Dundas) is the main high power transmission site in South-Western Victoria.

Given that all five Mt Dundas digital services operate on VHF Band III Block A channels, it is proposed that the identified channel block for Western Victoria should be Block A.

Proposed channel allotments for Western Victoria follow the general guidance given in Principle 6 and are shown in the Table 2.3.

### 2.2.4 BENDIGO Block B

Bendigo (Mt Alexander) is one of two high power transmission sites in Central-Western Victoria.

Bendigo currently has two digital services operating in Block B, and three digital services operating above channel 45. Bendigo is incompatible with most Melbourne area repeaters[6] which should preferably not operate on Block B due to potential receive antenna limitations (as per Principle 7). Therefore, in order to maximise channel block opportunities for Melbourne area repeaters, it is proposed that the identified channel block for Bendigo should be Block B.

Proposed channel allotments for Bendigo follow the general guidance given in Principle 6 and are shown in Table 2.4. The proposed allotments avoid changing the operating SBS28 and AMV31 digital services, and align the unallotted channel at Bendigo with the

[6] Except Healesville and Anglesea/Aireys Inlet.

Melbourne MGV32 digital service. This will allow Bendigo to be restacked as soon as any Melbourne SBS digital simulcast ends.

### 2.2.5 BALLARAT Block C

Ballarat (Lookout Hill) is one of two high power transmission sites in Central-Western Victoria.

Ballarat has three digital services currently operating in Block D, one in Block C and one in Block E (which must be avoided to avoid co-channel operation with Murray Valley). Discussions with regional commercial broadcasters indicated a preference for Ballarat operating on Block C; firstly to have the very high power site operating on a lower frequency block, and secondly to minimise the possibility for adjacent-channel input feed issues. This is because Block D is adjacent to both Blocks C and E, while Block C is only adjacent to Block D (since Block B is seldom used by repeater sites). Ballarat is likely to provide off-air inputs for ten repeater sites post-restack. Therefore, it is proposed that the identified channel block for Ballarat should be Block C.

Proposed channel allotments for Ballarat follow the general guidance given in Principle 6 and are shown in Table 2.4.

### 2.2.6 HORSHAM Block D

Horsham (Mt Arapiles) is the transmission site that serves areas around and including Horsham, Natimuk, Dimboola and Jeparit, in South-Western Victoria.

Horsham must avoid co-channel operation with Ballarat (Block C) and South East (Block B), and should also avoid co-channel operation with Murray Valley (Block E) and Bendigo (Block B). Therefore, it is proposed that the identified channel block for Horsham should be Block D.

Proposed channel allotments for Horsham follow the general guidance given in Principle 6 and are shown in Table 2.3.

### 2.2.7 NHILL Block E

Nhill (Mt Lawloit) is the transmission site that serves areas around and including Nhill, Kaniva, Goroke and Rainbow, in South-Western Victoria.

Nhill must avoid co-channel operation with Ballarat (Block C), South East (Block B) and Horsham (Block D). Therefore, it is proposed that the identified channel block for Nhill should be Block E, co-channel with Murray Valley.

Proposed channel allotments for Nhill follow the general guidance given in Principle 6 and are shown in Table 2.3.

### 2.2.8 GOULBURN VALLEY Block C

Goulburn Valley (Mt Major) is the main high power transmission site in Central Eastern Victoria.

Goulburn Valley has two digital services currently operating in Block C, two in Block D and one in VHF Band III. Goulburn Valley is predicted to be compatible with Ballarat and in the interests of efficient spectrum use[7], it is proposed that the identified channel block for Goulburn Valley should be Block C.

[7] Particularly for the Victorian Highlands area repeaters from Broadford to Mansfield, and Deniliquin and Jerilderie which should avoid co-channel operation with both Goulburn Valley and Ballarat.

Proposed channel allotments for Goulburn Valley follow the general guidance given in Principle 6 and are shown in Table 2.5.

### 2.2.9 UPPER MURRAY Block A

Upper Murray (Mt Baranduda) is the main high power transmission site in North-Eastern Victoria.

Given that all five Mt Baranduda digital services operate on VHF Band III Block A channels, it is proposed that the identified channel block for Upper Murray should be Block A.

Proposed channel allotments for Upper Murray follow the general guidance given in Principle 6 and are shown in Table 2.6. In accordance with Principle 7, the current ABC9A service should be re-tuned to clear the digital radio sub-band, to either channel 6 or 11. Channel 11 was preferred for the ABC service due to the legacy usage of channel 11 by a former analog service.

### 2.2.10 LATROBE VALLEY Block B

Latrobe Valley (Mt Tassie) is the main high power transmission site in the Gippsland region.

Latrobe Valley currently has two digital services operating in Block B, two in Block C (which should be avoided to avoid co-channel operation with Ballarat) and one in Block D. Latrobe Valley is incompatible with several Melbourne area repeaters[8], which should preferably not operate on Block B due to receive antenna limitations (as per Principle 7) and due to incompatibility with Bendigo. Since Latrobe Valley is predicted to be compatible with Bendigo, and in order to maximise channel block opportunities for Melbourne area repeaters, it is proposed that the identified channel block for Latrobe Valley should be Block B.

The proposed allotments avoid changing the operating SBS30 and AMV33 digital services, and align the unallotted channel at Latrobe Valley with the Melbourne MGV32 digital service. This will allow Latrobe Valley to be restacked as soon as any Melbourne SBS29 digital simulcast ends.

### 2.2.11 MURRUMBIDGEE IRRIGATION AREA Block B

Murrumbidgee Irrigation Area (Mt Bingar) is the main high power transmission site in the Griffith and the MIA TV1 licence area.

Murrumbidgee Irrigation Area has two digital services currently operating in Block A and one in Block B, and due to Principle 7, should operate on one of these two blocks. Since Murrumbidgee Irrigation Area should avoid co-channel operation with Upper Murray on Block A, it is proposed that the identified channel block for Murrumbidgee Irrigation Area should be Block B.

Proposed channel allotments for Murrumbidgee Irrigation Area follow the general guidance given in Principle 6 and are shown in Table 2.8.

[8] Unacceptable interference is not predicted to Ferntree Gully, Healesville, Marysville, Gisborne or Anglesea/ Aireys Inlet.

## 2.3 Mildura/Sunraysia

Table 2.1 shows the proposed block identifications and channel allotments for the main station and repeater sites in the Mildura/Sunraysia TV1 licence area. Block identifications and channel allotments for Mildura/Sunraysia are explained in Section 2.2.1.

**Table 2.1 Proposed channel allotments for the Mildura/Sunraysia TV1 licence area**

| Area Served | Pol | 6 | 7 | 8 | 9 | 9A | 10 | 11 | 12 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MILDURA/ SUNRAYSIA | H | PTV | STV | SBS | | | MDV | ABC | UA | | | | | | | | | | | | | | | | | | | | | | | | |
| Robinvale | V | | | | | | | | | | | | | | | SBS | ABC | STV | PTV | MDV | UA | | | | | | | | | | | | |
| Ouyen | V | | | | | | | | | | | | | | | | | | | | | UA | STV | PTV | MDV | ABC | SBS | | | | | | |
| Underbool | V | | | | | | | | | | | | | | | SBS | ABC | PTV | STV | MDV | UA | | | | | | | | | | | | |

A review of current channel usage of Mildura/Sunraysia licence area repeaters found that none of the sites were natural Block A or Block B sites. Operation on these blocks has been avoided for Mildura region repeater sites.

Proposed channel allotments follow the general guidance given in Principle 6. The channel allotments for Robinvale and Ouyen were selected to minimise changes to existing digital services, while at Underbool, the default channel order was followed.

### 2.3.1 Ouyen — Block D

The Ouyen town services and the in-band link services to Walpeup that are transmitted from the Ouyen site, are treated together because these services are provided from common transmitters, notwithstanding that they are radiated from two different antennas; one panel pointing at the town of Ouyen, and the other a grid pack antenna that provides an input to the Underbool service transmitted from Walpeup.

In order to protect coverage surrounding the town of Ouyen, co-channel operation with Renmark/Loxton and Murray Valley should be avoided. In order to minimise the likelihood of interference to the input feed to Underbool, and coverage to the town of Walpeup, co-channel operation with Underbool and Murray Valley must be avoided.

Given that Block B is proposed for use at Renmark/Loxton and Block E is proposed for use at Murray Valley, either Block C or D may be available for Ouyen. Broadcasters have indicated that Block C is not within the current frequency range of the transmit antenna for the in-band link at Ouyen. Therefore, it is proposed that the identified channel block for Ouyen should be Block D.

The proposed channel allotments for Ouyen were chosen to avoid changes to existing Block D services (STV41 and MDV43), while the unallotted channel was aligned with the Renmark/Loxton SBS40 service, to avoid a delay to the restack for Ouyen, as Renmark/Loxton cannot restack until after Adelaide ASO and restack.

### 2.3.2 Underbool — Block C

Underbool should avoid co-channel operation with Renmark/Loxton (proposed to use Block B); Murray Valley (proposed to use Block E); and Ouyen (proposed to use Block D). Therefore, it is proposed that the identified channel block for Underbool should be Block C.

### 2.3.3 Robinvale Block C

Both Robinvale and Ouyen have been planned on the basis of providing better than suburban grade signal levels to the target coverage areas as reflected in Advisory Notes on the transmitter specifications of services at both sites.

Robinvale must avoid co-channel operation with Murray Valley (proposed to use Block E). Interference studies suggest that, if possible, co-channel operation with Renmark/Loxton (proposed to use Block B) should be avoided. Although Robinvale and Ouyen are currently co-channelled and are protected within the planned suburban grade level, changing the current pairing of these sites could provide greater operating margin for both coverage areas. It is therefore proposed that the identified channel block for Robinvale should be Block C.

## 2.4 North-Western Victoria

Table 2.2 shows the proposed block identifications and channel allotments for the main station and repeater sites in the North-Western Victoria region. Block identifications and channel allotments for Murray Valley are explained in Section 2.2.2.

**Table 2.2 Proposed channel allotments for the North-Western Victoria Region**

| Area Served | Pol | 6 | 7 | 8 | 9 | 9A | 10 | 11 | 12 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MURRAY VALLEY | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA |
| Koondrook/ Barham | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA |
| Cohuna | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| Wycheproof | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| Birchip | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| Charlton | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| Balranald | V | | | | | | | | | | | | | | | | | | | | | ABC | BCV | AMV | SBS | VTV | UA | | | | | | |
| Hopetoun (VIC) | V | | | | | | | | | AMV | SBS | VTV | BCV | UA | ABC | | | | | | | | | | | | | | | | | | |
| Hopetoun-Beulah | V | | | | | | | | | | | | | | ABC | | | | | | | | | | | | | | | | | | |

A review of current channel usage of North-Western Victoria region repeaters found that there were no natural Block B sites other than Hopetoun (VIC) and Hopetoun-Beulah. All the sites addressed in this section should avoid co-channel operation with Murray Valley in Block E, unless operated as an on-channel repeater. Cohuna is currently operated as an on-channel repeater with Murray Valley. The proposed channel allotments for the repeater sites addressed in this section follow the general guidance given in Principle 6; while most follow the default allotment order, the channel allotments for Balranald avoided changing existing services within the block, while those for Hopetoun (VIC) were allotted to avoid potential adjacent-channel interference issues between the ABC33 Hopetoun-Beulah service and Hopetoun (VIC) services.

### 2.4.1 Koondrook/Barham Block E

Currently Cohuna services operate on the same channels as the Murray Valley services by the use of on-channel repeater equipment. Koondrook/Barham operates on a different set of channels. RBA (the operator of both the Koondrook/Barham and Cohuna retransmission sites) has proposed to reverse this configuration to provide an improved input signal level at the on-channel repeater site (Koondrook-Barham rather than Cohuna) that is more than 10 dB higher. This is expected to help achieve a greater input-output isolation level for the on-channel repeater equipment than can be achieved at the Cohuna site. This configuration also achieves slightly better co-channel compatibility with Deniliquin services with Cohuna than with Koondrook/Barham. Therefore, it is proposed that the identified block for Koondrook/Barham should be Block E.

### 2.4.2 Cohuna Block D

Given the proposed use of Block B at Bendigo and the proposed use of Block C at Ballarat, it is proposed that the identified channel block for Cohuna should be Block D.

### 2.4.3 Wycheproof **Block D**

Given the proposed use of Block B at Bendigo and the proposed use of Block C at Ballarat, it is proposed that the identified channel block for Wycheproof should be Block D.

### 2.4.4 Birchip **Block D**

Given the proposed use of Block B at Bendigo and the proposed use of Block C at Ballarat, it is proposed that the identified channel block for Birchip should be Block D.

### 2.4.5 Charlton **Block D**

Given the proposed use of Block B at Bendigo and the proposed use of Block C at Ballarat, it is proposed that the identified channel block for Charlton should be Block D.

### 2.4.6 Balranald **Block D**

Given the proposed use of Block B at Murrumbidgee Irrigation Area, and considering that there are three currently operating digital services in Block D, it is proposed that the identified channel block for Balranald should be Block D.

This places Balranald co-channel with Hay but studies indicate that these sites are mutually compatible.

### 2.4.7 Hopetoun (VIC) **Block B**

Hopetoun (VIC) currently transmits three regional commercial services from the site at Hopetoun town; two of those services are currently on channels within Block B.

Given the proposed use of Block E at Nhill, and Hopetoun (VIC)'s currently-operating services in Block B, it is proposed that the identified channel block for Hopetoun (VIC) should be Block B.

### 2.4.8 Hopetoun-Beulah **Block B**

Hopetoun-Beulah is an ABC-only site which is currently transmitting a channel 34 digital service that covers the townships of Hopetoun, Beulah, Brim, Yaapeet and possibly also Rainbow.

Murray Valley, Nhill and Ballarat are not compatible with Hopetoun-Beulah and cannot be co-channelled as severe interference in the towns of Hopetoun and Beulah would result. Horsham, Bendigo and Renmark/Loxton are also not compatible with Hopetoun-Beulah and should not be co-channelled as interference in the townships of Brim, Yaapeet and Rainbow would result. Hopetoun-Beulah should also not be co-channelled with Horsham as some interference to reception of the Horsham signal at Jeparit is predicted. On the other hand, while some interference is predicted to the coverage of Warracknabeal, there is no interference within the boundary of the Warracknabeal UCL for field strengths above 80 dBµV/m, as per the current licence Advisory Note.

Given the proposed use of Block E at Nhill, the proposed use of Block C at Ballarat, and the proposed use of Block D at Horsham, it is proposed that the identified ABC channel for Hopetoun-Beulah should be channel 33 within Block B. However, its coverage will be interference-limited and therefore an advisory note that the service is only protected to a field strength of 70 dBµV/m will be added to the licence.

It should be noted that the Hopetoun (VIC) and Hopetoun-Beulah services are not compatible. Therefore, it is proposed that licensing of the ABC service at Hopetoun-Beulah and Hopetoun (VIC) would be based on assumed operation at both sites, but with a licence Advisory Note informing that SFN operation would be required if both sites transmit an ABC service. The ABC will also be required to protect the operation of a future Hopetoun (VIC) service using the unallotted channel (channel 32).

The ABC is invited to advise its intentions concerning the future of the Hopetoun-Beulah service. If necessary, adjustments can be made when finalising the TLAP.

## 2.5 South-Western Victoria

Table 2.3 shows the proposed block identifications and channel allotments for the main station and repeater sites in the South-Western Victoria region. Block identifications and channel allotments for Western Victoria, Horsham and Nhill are explained in Sections 2.2.3, 2.2.6 and 2.2.7.

**Table 2.3 Proposed channel allotments for the South-Western Victoria Region**

| Area Served | Pol | 6 | 7 | 8 | 9 | 9A | 10 | 11 | 12 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WESTERN VICTORIA | H | ABC | SBS | UA | | | VTV | BCV | AMV | | | | | | | | | | | | | | | | | | | | | | | | |
| Coleraine | H | | | | | | | | | | | | | | | | | | | | | | | | | | | | ABC | | | | |
| Casterton | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| HORSHAM | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| NHILL | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA |
| Portland | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| Warrnambool (Tower Hill) | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | VTV | BCV | UA | ABC | AMV |
| Warrnambool City | V | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | | | | | | | | | | | | | |

A review of current channel usage of South-Western Victoria region repeaters found that all the sites addressed in this section should avoid co-channel operation with Western Victoria in Block A. The proposed channel allotments for the repeater sites addressed in this section follow the general guidance given in Principle 6; while most follow the default allotment order, channels for Warrnambool (Tower Hill) were allotted so that existing services within the block were not changed.

### 2.5.1 Warrnambool (Tower Hill) Block E

Given the proposed use of Block C at Ballarat and the proposed use of Block B at South East, Blocks D or E are potentially available for use at Warrnambool (Tower Hill). Since there are three currently operating digital services at Warrnambool (Tower Hill) in Block E, it is proposed that Block E should be used at Warrnambool (Tower Hill).

Co-channel operation with Portland, Warrnambool City and Terang must also be avoided. To a lesser extent, co-channel operation with Bendigo and Timboon should also be avoided.

### 2.5.2 Portland Block D

Given the proposed use of Block C at Ballarat, the proposed use of Block E at Warrnambool (Tower Hill) and the proposed use of Block B at South East, it is proposed that the identified channel block for Portland should be Block D.

Co-channel operation with Warrnambool City must also be avoided. To a lesser extent, co-channel operation with Bendigo should also be avoided.

### 2.5.3 Warrnambool City Block B

Given the proposed use of Block C at Ballarat, the proposed use of Block E at Warrnambool (Tower Hill) and the proposed use of Block D at Portland, it is proposed that the identified channel block for Warrnambool City should be Block B. It is noted that while current digital services for Warrnambool City are on channels 56 and above, the

ABC analog service previously operated on channel 29, so there may be a legacy population of antennas that have good performance on Band IV channels.

Co-channel operation with Terang and Cobden must also be avoided.

### 2.5.4 Casterton — Block D

Given the proposed use of Block B at South East, the proposed use of Block C at Ballarat and noting that it would be desirable to avoid co-channel operation with Coleraine, either Block D or E may be possible at Casterton. Studies of the impact of Portland and Warrnambool (Tower Hill) into each of Casterton and Coleraine indicate that pairing Warrnambool (Tower Hill) with Coleraine and Portland with Casterton is preferable to the opposite configuration. Therefore it is proposed that the identified channel block for Casterton should be Block D.

### 2.5.5 Coleraine — Block E

Given the proposed use of Block B at South East, and considering that it would be desirable to avoid co-channelling with Ballarat, Portland and Casterton, it is proposed that the identified channel block for Coleraine should be Block E. This will require a channel change at the site, but an antenna change is not expected to be required since the currently operating service appears to use a CBS6 style slot antenna.

## 2.6 Central-Western Victoria

Table 2.4 shows the proposed block identifications and channel allotments for the main station and repeater sites in the Central-Western Victoria Region. Block identifications and channel allotments for Bendigo and Ballarat are explained in Sections 2.2.4 and 2.2.5.

A block identification has not been made for the Wye River retransmission site. If channel allotments for this site are required in future, they should be made within the framework provided in Table 2.4.

**Table 2.4 Proposed channel allotments for the Central-Western Victoria Region**

| Area Served | Pol | 6 | 7 | 8 | 9 | 9A | 10 | 11 | 12 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BENDIGO | H | | | | | | | | | SBS | ABC | VTV | AMV | UA | BCV | | | | | | | | | | | | | | | | | | |
| BALLARAT | H | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | | | | | | | |
| Waubra | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA |
| Learmonth (VIC) | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA |
| Ballarat East | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| Halls Gap | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA |
| Warracknabeal | H | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | | | | | | | | | | | | | |
| Terang | V | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | | | | | | | |
| Colac | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | VTV | UA | BCV | AMV |
| Cobden | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | |
| Timboon | H | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | | | | | | | | | | | | | |
| Mt Cowley IBL | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | AMV | VTV | BCV | | |
| Lorne | H | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA | | | | | | | | | | | | |
| Tanybryn IBL | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | | AMV | VTV | BCV | |
| Apollo Bay | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA |

A review of current channel usage of Central-Western Victoria region repeaters found that only the new gap filler sites at Warracknabeal and Timboon could be considered for Block B. The repeaters addressed in this section should avoid co-channel operation with Ballarat in Block C, with the exception of Lorne, Apollo Bay, and Tanybryn IBL and Terang (which operates as an on-channel repeater). The proposed channel allotments for the repeater sites addressed in this section follow the general guidance given in Principle 6; while most follow the default allotment order, the allotted channels for Colac have maintained the existing services within the block.

### 2.6.1 Warracknabeal Block B

When the Warracknabeal gap filler services were being designed, it was found that Murray Valley, Horsham, Ballarat, Bendigo and Nhill were predicted to cause interference within the Warracknabeal UCL; so nominally all channel blocks would be unavailable post-restack. The lowest levels of interference are predicted to be caused by Bendigo and Nhill. At the time the Warracknabeal service commenced, post-restack arrangements for these sites were not known, therefore the Warracknabeal transmitter site was selected so that cross-polar co-channel operation with Nhill or co-polar co-channel operation with Bendigo would be possible with the aid of side-lobe receive antenna rejection towards both sites.

After site access and detailed design work were concluded it was determined that the Warracknabeal site would be located at the SMR Wheat Silo (Site ID 51201) with a H-pol dual-panel array (vertically stacked) at 35 m above ground level, oriented due south, with a 200W ERP. Interference from Bendigo and Nhill within the Warracknabeal UCL boundary was predicted to be limited to unpopulated areas. Therefore, the Advisory Notes attached to the current Warracknabeal Transmitter Specifications state that:

> *"Any transmission in accordance with this technical specification is planned on the basis that it will only be protected against interference from other broadcasting services within the Warracknabeal Urban Centre and Locality boundary and where the minimum median field strength level of the wanted signal is at least 80 dBµV/m."*

Channel planning for major sites in Victoria (see Section 2.2) concluded that Nhill should operate co-channel with Murray Valley. Since Murray Valley is predicted to cause unacceptable interference to Warracknabeal, it is therefore proposed that the identified channel block for Warracknabeal should be Block B, co-channel with Bendigo.

### 2.6.2 Waubra Block E

Given the proposed use of Block B at Bendigo, and considering that there is a currently operating Waubra digital service in Block E, it is proposed that the identified channel block for Waubra should be Block E.

### 2.6.3 Learmonth (VIC) Block E

Given the proposed use of Block B at Bendigo, and considering that there is a currently operating Learmonth digital service in Block E, it is proposed that the identified channel block for Learmonth (VIC) should be Block E.

### 2.6.4 Ballarat East Block D

The Ballarat East gap filler was selected to be horizontally-polarised so that viewers could repoint their existing H-pol UHF receive antennas towards the gap filler at the WIN studios in Ballarat.

Given the proposed use of Block B at Bendigo and Block E at Waubra and Learmonth (VIC), it is proposed that the identified channel block for Ballarat East should be Block D.

### 2.6.5 Halls Gap Block E

Given the proposed use of Block D at Horsham, it is proposed that the identified channel block for Halls Gap should be Block E.

### 2.6.6 Terang Block C

The Terang gap filler was designed as, and is currently operating as, an on-channel repeater of Ballarat. Therefore, it is proposed that the identified channel block for Terang should be Block C, co-channel with Ballarat.

### 2.6.7 Colac Block E

Colac cannot operate co-channel with Ballarat (which provides its off-air input) or Cobden (adjacent coverage area). Detailed interference studies with some propagation models suggest that Colac may cause interference to Rosebud in the Melbourne TV1 licence

area for low percentages of time. While this pairing is currently operating and the ACMA is not aware of reported problems with this pairing it would be preferable to avoid pairing Colac with Safety Beach/ Rosebud.

Given the currently proposed use of Block D at Rosebud, along with three currently operating digital services at Colac in Block E, it is proposed that the identified channel block for Colac should be Block E.

#### 2.6.8 Cobden — Block D

Given the proposed use of Block E at Colac and Warrnambool (Tower Hill) and the proposed use of Block B at Bendigo and Warrnambool City, it is proposed that the identified channel block for Cobden should be Block D.

#### 2.6.9 Timboon — Block B

Given the proposed use of Block E at Warrnambool (Tower Hill), the proposed use of Block D at Cobden and Portland, it is proposed that the identified channel block for Timboon should be Block B.

Due to some predicted co-channel interference from Warrnambool City, South East and Bendigo, this service is only protected within the boundary of the Timboon UCL and where field strengths are greater than 67 dBµV/m.

#### 2.6.10 Lorne — Block C

Lorne is not compatible with Anglesea/Aireys Inlet, Safety Beach, Rosebud, Ferntree Gully, and the possible Geelong-Drysdale and Ocean Grove services in the Melbourne TV1 licence area. Additionally Lorne is not compatible with Latrobe Valley; however, predictions indicate that Lorne is compatible with and can co-channel with Ballarat.

While channel arrangements for Melbourne area repeaters have not been finalised, channel blocks being considered for sites that may affect channel selections at Lorne are Block B at Anglesea/Aireys Inlet, Block D at Safety Beach/Rosebud and possibly Ocean Grove and Block E at Geelong-Drysdale.

Given the proposed use of Block B at Latrobe valley and Anglesea/Aireys Inlet, the possible use of Block D at Safety Beach/Rosebud and possibly Ocean Grove, and the proposed use of Block E at Geelong-Drysdale, it is proposed that the identified channel block for Lorne should be Block C.

#### 2.6.11 Mt Cowley IBL — Block E

The purpose of the Mt Cowley IBL is to provide an off-air input for commercial and SBS services at the Lorne repeater site. The sites predicted to produce the highest nuisance field strengths at the Lorne repeater site at a receive antenna height of 25 m (taking into account directivity and polarisation discrimination of receive antenna[9] pointing towards the Mt Cowley IBL) are Anglesea/Aireys Inlet, Warburton (VIC), Ballarat, Safety Beach, Latrobe Valley, Selby, Ocean Grove and Healesville.

While channel arrangements for Melbourne area repeaters have not been finalised, the channel blocks being considered for sites that may affect channel selections at Mt Cowley IBL are Block B at Anglesea/Aireys Inlet, Block C at Selby and Healesville and Block D at Safety Beach/Rosebud and possibly Ocean Grove.

Given the proposed use of Block A at Melbourne, Block B at Latrobe Valley and Anglesea/Aireys Inlet, Block C at Ballarat, Selby and Healesville, and the possible use of Block D at Safety Beach/Rosebud and possibly Ocean Grove, it is proposed that the identified channel block for the Mt Cowley IBL should be Block E. Co-channel operation

[9] The calculations model a yagi receive antenna, although in practice a different antenna, such as a grid pack, could be used.

with Colac (the strongest Block E interferer) is predicted to result in a fade margin[10] of around 15 dB.

It should be noted that this block identification will break up the current arrangement whereby Lorne operates as an on-channel repeater of Mt Cowley IBL.

The proposed channel allotments for Mt Cowley IBL only provide for four channels (because the Lorne ABC service is satellite-fed, the ABC service has been omitted at Mt Cowley), and follow the order SBS46, AMV47, VTV48 and TNQ49.

### 2.6.12 Apollo Bay — Block E

The digital conversion of the retransmission site at Apollo Bay was designed to operate as an on-channel repeater of the Tanybryn IBL (see below).

Given the proposed use of Block B at Latrobe Valley and Block D at Safety Beach and NE Tasmania, it is proposed that the identified channel block for Apollo Bay should be Block E.

### 2.6.13 Tanybryn IBL — Block E

The purpose of Tanybryn IBL is to provide off-air inputs for commercial and SBS services at Apollo Bay. The sites predicted to produce the highest nuisance field strengths at the Apollo Bay repeater site at a receive antenna height of 25 m (taking into account directivity and polarisation discrimination of a receive antenna[11] pointing towards the Tanybryn IBL site) are Safety Beach, Melbourne Inner Suburbs, Latrobe Valley, Healesville, Ballarat, Bendigo, Ocean Grove and Selby.

While channel arrangements for Melbourne area repeaters have not been finalised, the channel blocks being considered for sites that may affect channel selections at Tanybryn IBL are Block C at Selby and Healesville and Block D at Safety Beach/Rosebud and Melbourne Inner Suburbs/South Yarra and possibly Ocean Grove.

Given the proposed use of Block A at Melbourne, Block B at Latrobe Valley and Bendigo, the proposed use of Block C at Ballarat, Selby, and Healesville, and the possible use of Block D at Safety Beach/Rosebud, Melbourne Inner Suburbs/South Yarra and possibly Ocean Grove, it is proposed that the identified channel block for the Tanybryn IBL should be Block E. Co-channel operation with Mt Cowley IBL (the strongest Block E interferer) is predicted to result in a fade margin[12] of around 26 dB.

The proposed channel allotments for Tanybryn IBL align with Apollo Bay channels, with the omission of the ABC47 service as the ABC service at Apollo Bay is satellite fed.

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[10] $FM = E_{\text{MtCowley-50,50}} - E_{\text{Colac-50,1}} - PR + D_{az} + D_{pol}$

[11] The calculations model a yagi receive antenna, although in practice a different antenna, such as a grid pack, could be used.

[12] $FM = E_{\text{Tanybryn-50,50}} - E_{\text{MtCowley-50,1}} - PR + D_{az} + D_{pol}$

## 2.7 Central-Eastern Victoria region

Table 2.5 shows the proposed block identifications and channel allotments for the main station and repeater sites in the Central-Eastern Victoria region. Block identifications and channel allotments for Goulburn Valley are explained in Section 2.2.8.

**Table 2.5 Proposed channel allotments for the Central-Eastern Victoria Region**

| Area Served | Pol | 6 | 7 | 8 | 9 | 9A | 10 | 11 | 12 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GOULBURN VALLEY | H | | | | | | | | | | | | | | | AMV | VTV | SBS | ABC | GLV | UA | | | | | | | | | | | | |
| Broadford | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | BCV | UA |
| Seymour | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA | | | | | | |
| Alexandra | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA |
| Mansfield | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA |
| Bonnie Doon | V | | | | | | | | | UA | SBS | GLV | VTV | ABC | AMV | | | | | | | | | | | | | | | | | |
| Alexandra Environs | V | | | | | | | | | | | | | | | | | | | | | | ABC | SBS | | | | | | | | | |
| Yea | H | | | | | | | | | | | | | | | ABC | AMV | VTV | SBS | GLV | UA | | | | | | | | | | | | |
| Eildon | V | | | | | | | | | | | | | | | ABC | AMV | VTV | SBS | GLV | UA | | | | | | | | | | | | |
| Eildon Town | H | | | | | | | | | | | | | | | | | | | | | | ABC | SBS | | | | | | | | | |
| Howqua | V | | | | | | | | | | | | | | | VTV | SBS | ABC | AMV | GLV | UA | | | | | | | | | | | | |
| Deniliquin | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA | | | | | | |
| Jerilderie | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA | | | | | | |

A review of current channel usage of Central-Eastern Victoria region repeaters found that Bonnie Doon, Alexandra Environs and Howqua could be considered for use as Block B sites. Unlike most of the other regions considered in this report, several sites can operate co-channel with the main high-power site (Goulburn Valley). These are: Yea, Bonnie Doon, Eildon, Eildon Town and Howqua. The proposed channel allotments for the repeater sites addressed in this section follow the general guidance given in Principle 6 and where applicable maintain existing services that operate within the proposed channel blocks.

### 2.7.1 Broadford Block E

Broadford is incompatible with Bendigo and Goulburn Valley. Comparative studies to assess the potential interference impact of the Broadford services with co-channel operation with either Geelong-Drysdale or Melbourne Inner Suburbs (two gap filler sites which may be introduced by metropolitan commercial broadcasters). Those studies found that with appropriate selection of ERP levels, antenna radiation patterns and protection levels of Melbourne repeaters both proposed Melbourne services can be protected. It was however found that pairing Broadford with the proposed Geelong-Drysdale repeater (together with modifications to the initially proposed antenna HRP and polarisation) would yield the least overall constraint on the proposed Melbourne area repeaters.

Given that Block B is proposed for use at Bendigo and Block C is proposed for use at Goulburn Valley, either Block D or E is potentially available at Broadford. Co-channel operation with Seymour should also be avoided.

The current thinking on the potential Melbourne licence area gap fillers is that Melbourne Inner Suburbs may operate on Block D, while Geelong-Drysdale may operate on Block E.

Therefore it is proposed that the identified channel block for Broadford should be Block E.

#### 2.7.2 Seymour — Block D

Given the proposed use of Block B at Bendigo, the proposed use of Block C at Goulburn Valley and the proposed use of Block E for the adjacent area Broadford service, it is proposed that the identified channel block for Seymour should be Block D.

#### 2.7.3 Mansfield — Block E

Given the proposed use of Block B at Bendigo, the proposed use of Block C at Goulburn Valley and Ballarat, either Block D or E may be available at Mansfield. If Mansfield and Seymour were to be co-channelled some interference is predicted from Seymour into eastern parts of the Mansfield coverage, around Tolmie. While this interference could be resolved by incorporating Seymour into the Alexandra/Mansfield SFN, this is not the existing arrangement, and the preference (consistent with Principle 8) is to not alter the current SFN arrangement. Therefore, it is proposed that the identified channel block for Mansfield should be Block E.

#### 2.7.4 Alexandra — Block E

All five broadcaster services at Alexandra and Mansfield currently operate on common channels. It is understood that these services currently operate in SFNs. Given that Alexandra needs to avoid co-channel operation with Goulburn Valley and Bendigo (along with some other sites addressed below), it is proposed that the co-channel/SFN operation with Mansfield be continued post-restack. Therefore, it is proposed that the identified channel block for Alexandra should be Block E.

#### 2.7.5 Bonnie Doon — Block B

Mansfield provides the off-air input for Bonnie Doon. Alexandra and Bonnie Doon should preferably not be co-channelled to avoid minor interference predicted from Alexandra. Studies also indicate that while there is some predicted interference to unpopulated fringes of the Bonnie Doon coverage, Bendigo digital services are compatible with co-channel operation of Bonnie Doon digital services.

Given that Bonnie Doon currently has four operating digital services in Block B, it is proposed that the identified channel block for Bonnie Doon should be Block B.

#### 2.7.6 Alexandra Environs — Block D

Alexandra Environs is a site that only provides ABC and SBS services.

Alexandra provides the off-air input for Alexandra Environs. Studies found that Bendigo digital services would cause some interference to the fringes of the coverage of the Alexandra Environs digital services. Studies also indicate that co-channel operation with Eildon should be avoided, but that compatible co-channel operation with Eildon Town is possible. Therefore, it is proposed that the Alexandra Environs services should be located in Block D.

In order to avoid the currently operating VTV40 service at Eildon, the channel allotments are ABC41 and SBS42.

#### 2.7.7 Eildon — Block C

Given the proposed use of Block D at Alexandra Environs and the proposed use of Block E at Alexandra, and since it is not certain that viewer antennas at Eildon would perform well on Block B, it is proposed that the identified channel block for Eildon should be Block C. It is also noted that two of the five currently operating digital services at Eildon operate in Block C.

### 2.7.8 Eildon Town — Block D

Eildon Town is a site that only provides ABC and SBS services.

Given the proposed use of Block C at Eildon, either Block D or E could potentially be available at Eildon Town. It is also desirable to avoid co-channelling Eildon Town and Mansfield services. Therefore, it is proposed that the identified channel block for Eildon Town should be Block D.

In order to avoid the currently operating VTV40 service at Eildon, the channel allotments are ABC41 and SBS42.

### 2.7.9 Yea — Block C

Given the proposed use of Block B at Bendigo, and the proposed use of Block D at Seymour, either Blocks C or E could potentially be available at Yea. Given that two of the five currently operating digital services at Yea operate in Block C, it is proposed that the identified channel block for Yea should be Block C. This block identification would maintain the current co-channel pairing with Eildon.

### 2.7.10 Howqua — Block C

Given the proposed use of Block E at Mansfield, any of Blocks B, C or D could be available at Howqua. Given that three of the five currently operating digital services at Howqua operate in Block C, it is proposed that the identified channel block for Howqua should be Block C.

### 2.7.11 Deniliquin — Block D

Given the proposed use of Block B at Bendigo and Murrumbidgee Irrigation Area, the proposed use of Block C at Goulburn Valley and the proposed use of Block E at Murray Valley, it is proposed that the identified channel block for Deniliquin should be Block D.

This places Deniliquin co-channel with Hay but studies indicate that these sites are mutually compatible.

### 2.7.12 Jerilderie — Block D

Given the proposed use of Block B at Bendigo and Murrumbidgee Irrigation Area, the proposed use of Block C at Goulburn Valley and the proposed use of Block E at Murray Valley and SW Slopes/E Riverina, it is proposed that the identified channel block for Jerilderie should be Block D.

Co-channel operation of Jerilderie and Deniliquin is not predicted to result in unacceptable interference to Deniliquin reception where the wanted signal level is above 67 dBµV/m (to which the service is protected in accordance with the Deniliquin technical specifications). In the reverse direction, some interference to the Jerilderie rural grade service is predicted to sparsely populated areas to the west of Jerilderie. The towns of Finley and Berrigan are predicted to receive interference, but receive stronger interference-free signals from Goulburn Valley. To remove interference from these western sparsely populated areas, Deniliquin and Jerilderie could be operated in a SFN (equal delays).

Co-channel operation with Hay was found to cause minor predicted interference to southern fringes of the Jerilderie rural coverage contour, but the areas that are predicted to be potentially affected receive stronger signals from Goulburn Valley services.

## 2.8 North-Eastern Victoria region

Table 2.6 shows the proposed block identifications and channel allotments for the main station and repeater sites in the North-Eastern Victoria region. Block identifications and channel allotments for Upper Murray are explained in Section 2.2.9.

Block identifications have not been made for Yackandandah. If channel allotments for this site are required in future, they should be made within the framework provided in Table 2.6.

**Table 2.6 Proposed channel allotments for the North-Eastern Victoria Region**

| Area Served | Pol | 6 | 7 | 8 | 9 | 9A | 10 | 11 | 12 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UPPER MURRAY | H | UA | SBS | GLV | | | VTV | ABC | AMV | | | | | | | | | | | | | | | | | | | | | | | | |
| Kiewa | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | VTV | GLV | AMV | UA | | | | | | |
| Mt Stanley IBL | H | | | | | | | | | | | | | | | | | | | | | | GLV | | AMV | VTV | | | | | | | |
| Albury North | H | | | | | | | | | AMV | SBS | VTV | ABC | GLV | UA | | | | | | | | | | | | | | | | | | |
| Myrtleford | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | VTV | AMV | GLV | UA |
| Bright | H | | | | | | | | | SBS | AMV | VTV | ABC | GLV | UA | | | | | | | | | | | | | | | | | | |
| Tawonga South | V | | | | | | | | | SBS | AMV | VTV | ABC | GLV | UA | | | | | | | | | | | | | | | | | | |
| Kiewa Valley | H | | | | | | | | | | | | | | | | | | VTV | GLV | AMV | | | | | | | | | | | | |
| Harrietville | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA |
| Falls Creek | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | VTV | UA | | | | | | |
| Hunters Knob IBL | V | | | | | | | | | | | | | | | | | | | | | | GLV | | AMV | VTV | | | | | | | |
| Walwa/ Jingellic | V | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA | | | | | | | | | | | | |
| Corryong | V | | | | | | | | | | | | | | | GLV | UA | ABC | AMV | VTV | SBS | | | | | | | | | | | | |
| Khancoban | V | | | | | | | | | | | | | | | | | | | | | | | | | | | ABC | AMV | VTV | GLV | SBS | UA |

A review of current channel usage of North-Eastern Victoria region repeaters found that Albury North, Bright, Tawonga South and Corryong could be considered for use as Block B sites. Due to either co-channel interference from Upper Murray or lack of existing Band III receive antennas, none of the repeater sites in the North-Eastern Victoria region should operate on Block A. The proposed channel allotments for the repeater sites addressed in this section follow the general guidance given in Principle 6. Most of the proposed channel allotments avoided changes to existing services within the block, but at Falls Creek, Harrietville, Myrtleford, and Walwa/Jingellic there were no existing channels within the proposed block so the default channel order was followed. At Kiewa Valley, Mt Stanley IBL, Hunters Knob IBL, channel allotments were selected in order to avoid restack constraints.

### 2.8.1 Albury North — Block B

Albury North should avoid co-channel operation with SW Slopes/E Riverina in Block E, and to a lesser extent, Goulburn Valley in Block C. Given that both the digital services at Albury North that operate below channel 52 operate in Block B, it is proposed that the identified channel block for Albury North should be Block B.

### 2.8.2 Kiewa — Block D

Given the proposed use of Block B at Albury North and Murrumbidgee Irrigation Area and, given that two of the five currently operating digital services at Kiewa operate in each of Block D and Block E, therefore either of these blocks could be used at Kiewa. It is understood that the current transmitting antenna can operate on either Block D or Block E. Therefore, absent any other compelling reason, it is proposed that the identified channel block for Kiewa should be Block D which is the lower of the two potentially available blocks.

### 2.8.3 Myrtleford — Block E

Given the proposed use of Block C at Goulburn Valley and to avoid a change to the RD "A" type slot antenna that is understood to be in use at the site, it is proposed that the identified channel block for Myrtleford should be Block E.

VTV and AMV services have been placed on channels 48 and 49, respectively, to avoid an n+5 off-air feed combination between Mt Stanley IBL and Myrtleford.

### 2.8.4 Mt Stanley IBL — Block D

Mt Stanley IBL provides off-air input signals for all commercial services at Myrtleford and, possibly for GLV, to Kiewa Valley. The sites predicted to result in the highest nuisance field strengths at the Myrtleford repeater site at a receive antenna height of 15 m (taking into account directivity and polarisation discrimination of a receive antenna[13] pointing towards the Mt Stanley IBL site) are Upper Murray, Goulburn Valley and SW Slopes/E Riverina.

Given the proposed use of Block A at Upper Murray, Block C at Goulburn Valley and Block E at Myrtleford and SW Slopes/E Riverina, either Block B or D may be available. There is a yagi antenna pointing towards Big Hill (Kiewa Valley), which may have a relatively limited frequency range. Considering that there are services currently operating in Blocks D and E, it is proposed that the identified channel block for the Mt Stanley IBL should be Block D. Co-channel operation with Kiewa (the strongest Block D signal) is predicted to result in a fade margin[14] of over 40 dB at Myrtleford.

The channel allotments for Mt Stanley IBL are such that co-channel operation with the currently operating (pre-restack) Goulburn Valley GLV42 and AMV45 services is avoided.

### 2.8.5 Kiewa Valley — Block C

National services are not transmitted from the Kiewa Valley transmission site, only the three commercial services are provided.

Given the proposed use of Block D at Kiewa and Mt Stanley IBL and Block E at Myrtleford, it is proposed that the identified channel block for Kiewa Valley should be Block C. Block C is co-channel with Goulburn Valley but studies show that the two sites are mutually compatible.

Kiewa Valley provides the off-air input for Bright and Tawonga South commercial services. No interference is predicted to the off-air reception of Kiewa Valley for either site from sites for which Block C is proposed for post-restack operation. To minimise any adjacent-channel input feed issues at Kiewa Valley's child sites an allocation on channel 34 has been avoided. Also to avoid restack constraints due to currently operating Bright and Kiewa services channel 36 has been avoided.

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[13] The calculations model a yagi receive antenna, although in practice a different antenna, such as a grid pack, could be used.

[14] $FM = E_{MtStanley\text{-}50,50} - E_{Kiewa\text{-}50,1} - PR + D_{az} + D_{pol}$

### 2.8.6 Bright — Block B

Given the proposed use of Block C at Kiewa Valley, the proposed use of Block E at Myrtleford, and considering that two of the five currently operating digital services at Bright are in Block B, it is proposed that the identified channel block for Bright should be Block B.

### 2.8.7 Tawonga South — Block B

Given the proposed use of Block C at Kiewa Valley, and considering that two of the five currently operating digital services at Tawonga South are in Block B, it is proposed that the identified channel block for Tawonga South should be Block B. This block identification would maintain the current co-channel pairing with Bright.

### 2.8.8 Harrietville — Block E

In order to reduce the possible need for transmit antenna changes at Harrietville, it is proposed that the identified channel block for Harrietville should be Block E.

### 2.8.9 Falls Creek — Block D

Given the proposed use of Block B at Murrumbidgee Irrigation Area and Block E at SW Slopes/E Riverina, the potentially available blocks at Falls Creek are Block C and D. Predictions indicate that both Kiewa and Mt Stanley IBL (Block D) and Kiewa Valley and Goulburn Valley (Block C) may cause minor interference to unpopulated mountainous areas at the fringes of the Falls Creek coverage either pairing would be compatible. No transmit antenna tuning range or input feed considerations apply to channel block identification at this site, so while either Block could be used it is proposed that the identified channel block for Falls Creek should be Block D as this provides greater interference margins.

### 2.8.10 Hunters Knob IBL — Block D

Hunters Knob IBL provides off-air inputs for commercial services at Corryong and Walwa/Jingellic. The sites predicted to produce the highest nuisance field strengths at the Corryong and Walwa/Jingellic repeater sites (taking into account directivity and polarisation discrimination of a receive antenna[15] pointing towards these repeaters) are Upper Murray, SW Slopes/E Riverina, Goulburn Valley and, to a lesser extent, Murrumbidgee Irrigation Area.

Given the proposed use of Block A at Upper Murray, the proposed use of Block B at Murrumbidgee Irrigation Area, the proposed use of Block C at Goulburn Valley and the proposed use of Block E at SW Slopes/E Riverina, it is proposed that the identified channel block for the Hunters Knob IBL should be Block D. Co-channel operation with Kiewa (the strongest Block D interferer) is predicted to result in fade margins for 1% time[16] of around 28 dB and 46 dB at Walwa/Jingellic and Corryong, respectively.

The proposed channel allotments for Hunters Knob IBL avoid co-channel operation with the pre-restack Goulburn Valley GLV42 and AMV45 services.

### 2.8.11 Walwa/Jingellic — Block C

Given the proposed use of Block D at Hunters Knob IBL and Block E at SW Slopes/E Riverina, it is proposed that the identified block for Walwa/Jingellic should be Block C. This channel block will be co-channel with Corryong (see below) however due to the mountainous terrain between the sites the predicted interference between the sites is limited to unpopulated mountainous areas.

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[15] The calculations model a yagi receive antenna, although in practice a different antenna could be used.

[16] $FM = E_{\text{HuntersKnob-50,50}} - E_{\text{Kiewa-50,1}} - PR + D_{az} + D_{pol}$

### 2.8.12 Corryong Block C

Given the proposed use of Block D at Hunters Knob IBL and Block E at SW Slopes/E Riverina, and considering that two of the five currently operating digital services at Corryong operate in Block C, it is proposed that the identified block for Corryong should be Block C. As noted above, Block C operation at Corryong is compatible with Walwa/Jingellic.

The proposed channel allotments for Corryong have avoided changes to the existing GLV34 and AMV37 services, and have aligned the unallotted channel with the SW Slopes/E Riverina CTC35 analog service, which avoids this Southern NSW analog service constraining the restacking of Corryong services.

### 2.8.13 Khancoban Block E

Given the proposed use of Corryong in Block C, and considering that there is a currently operating digital service in Block E, it is proposed that the identified channel block for Khancoban should be Block E.

## 2.9 Gippsland region

Table 2.7 shows the proposed block identifications and channel allotments for the main station and repeater sites in the Gippsland region. Block identifications and channel allotments for Latrobe Valley are explained in Section 2.2.10.

**Table 2.7 Proposed channel allotments for the Gippsland Region**

| Area Served | Pol | 6 | 7 | 8 | 9 | 9A | 10 | 11 | 12 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LATROBE VALLEY | H | | | | | | | | | GLV | ABC | SBS | VTV | UA | AMV | | | | | | | | | | | | | | | | | | |
| Churchill | H | | | | | | | | | | | | | | | | | | | | | | | | | | | AMV | GLV | UA | ABC | VTV | SBS |
| Jeeralang/ Yinnar South | V | | | | | | | | | | | | | | | | | | | | | | | | | | | AMV | GLV | UA | ABC | VTV | SBS |
| Boolarra | V | | | | | | | | | | | | | | | | | | | | | | | | | | | AMV | GLV | UA | ABC | VTV | SBS |
| Newborough | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA | | | | | | |
| Trafalgar/ Yarragon | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA | | | | | | |
| Foster | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA | | | | | | |
| Inverloch | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA |
| Bairnsdale | H | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA | | | | | | | | | | | | |
| Bruthen | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | | | | |
| Lakes Entrance | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA |
| Nowa Nowa | H | | | | | | | | | | ABC | | | | | | | | | | | | | | | | | | | | | | |
| Orbost | H | | | | | | | | | | | | | | | | | | | | | GLV | ABC | SBS | AMV | VTV | UA | | | | | | |
| Cann River | H | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | VTV | AMV | GLV | UA |
| Genoa | V | | | | | | | | | | | | | | | UA | SBS | ABC | VTV | GLV | AMV | | | | | | | | | | | | |
| Mallacoota | V | | | | | | | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMV | VTV | GLV | UA |

A review of current channel usage of Gippsland region repeaters found that none of the repeater sites in the Gippsland region can operate co-channel with Latrobe Valley in Block B, with the exception of Nowa Nowa. The proposed channel allotments for the repeater sites addressed in this section follow the general guidance given in Principle 6; while most channels followed the default channel order, channels for Churchill, Jeeralang/Yinnar South, Boolarra, Orbost and Genoa were allotted in order to avoid changes to existing services within the block.

### 2.9.1 Churchill, Jeeralang/Yinnar South and Boolarra SFN Block E

These three sites currently operate in a SFN and so a common block should be identified for all three sites. Given that three of five currently operating digital services at these sites operate in Block E, it is proposed that the identified channel block for the Churchill-Jeeralang/Yinnar South-Boolarra SFN should be Block E.

Co-channel operation with Bairnsdale should be avoided.

### 2.9.2 Bairnsdale — Block C

Given the proposed use of Block D at NE Tasmania and the proposed use of Block E for the Churchill, Jeeralang/Yinnar South and Boolarra SFN, it is proposed that the identified channel block for Bairnsdale should be Block C.

### 2.9.3 Trafalgar/Yarragon and Newborough SFN — Block D

These two sites currently operate in an SFN and so the same block has been identified at both sites. Given the proposed use of Bairnsdale in Block C and, to a lesser extent, the proposed use of Block C at Selby and Upwey in Melbourne that block should not be used. Studies, however, indicated that the Trafalgar-Yarragon and Newborough SFN is able to be compatibly co-channelled with Rosebud services and with both national and commercial pattern Safety Beach services. So the identified channel block for the Trafalgar/Yarragon and Newborough SFN could be either Block D or Block E.

To avoid minor potential fringe interference between this SFN and the Churchill/Boolarra/Jeeralang-Yinnar South SFN it is proposed to operate the Trafalgar-Yarragon/Newborough SFN on Block D.

### 2.9.4 Foster — Block D

Foster can occupy any channel block except Block B. To avoid current Latrobe Valley channels constraining the restacking order of sites, Foster channels should be on Block D or E. It is proposed that the identified channel block for Foster should be Block D.

### 2.9.5 Inverloch — Block E

Inverloch can occupy any channel block except Block B. To avoid replacement of the current UD (upper) antenna, and to avoid Inverloch being constrained by the restacking of currently operating Latrobe Valley channels, Inverloch channels should be on either Block D or E. It is proposed that the identified channel block for Inverloch should be Block E.

### 2.9.6 Lakes Entrance — Block E

Given the proposed use of Block D at NE Tasmania and the proposed use of Block C at Bairnsdale, it is proposed that the identified channel block for Lakes Entrance should be Block E.

### 2.9.7 Orbost — Block D

Given the proposed use of Block C at Bairnsdale and the proposed use of Block E at Lakes Entrance, it is proposed that the identified channel block for Orbost should be Block D. As such, Orbost would operate co-channel with NE Tasmania. This co-channelling has been studied using three different propagation models. Predictions made using the most conservative model suggest that Orbost digital services might experience some interference from NE Tasmania during anomalous sea-path propagation events for small percentages of time.

To mitigate the small potential interference risk an increase of up to 6 dB in the licensed ERP for Orbost has been considered. Since the nearest Block D services will be in North-Eastern Victoria or on the NSW South Coast, in the order of 150 km away over mountainous terrain, it is expected that there will be no issue with interference from an increased ERP Orbost service.

The channel allotments at Orbost were selected to avoid changes to the current AMV43 and VTV44 digital services. The pre-restack Latrobe Valley ABC42 service blocks the use of channel 42 at Orbost. However, there is no current SBS service operating at Orbost. Therefore, the notional channel reservation for a future SBS service has been aligned with Latrobe Valley ABC42 service, therefore that potential future service cannot commence until after the Latrobe Valley ABC42 service is restacked. Taking these factors into account the proposed channel allotment at Orbost is GLV40, ABC41, SBS42, AMV43, VTV44 and UA45.

### 2.9.8 Nowa Nowa — Block B

Because Nowa Nowa is an ABC-only site, it is expected that for the other four broadcasters viewers may attempt to fortuitously receive signals below the minimum planning field strength level from surrounding sites. Since the sites most likely to provide fortuitous coverage are Lakes Entrance and Orbost, and these have previously transmitted analog Band IV services, it is expected that most (perhaps all) existing receive antennas at Nowa Nowa will be capable of receiving Band IV signals.

Given the proposed use of Block C at Bairnsdale, the proposed use of Block E at Lakes Entrance, and to a lesser extent, the proposed use of Block D at Orbost, it is proposed that the identified channel block for Nowa Nowa should be Block B.

Co-channel operation of Nowa Nowa with Latrobe Valley is not predicted to result in unacceptable interference to or from Latrobe Valley services. Channel 29 has been selected for the Nowa Nowa ABC service since, apart from Latrobe Valley (Mt Tassie), this channel is not used for any other Gippsland region or adjacent remote licence area site that will present incompatibility concerns with this site.

There is potential for some minor fringe interference to Latrobe Valley and Nowa Nowa reception around the outskirts of the Nowa Nowa coverage. To mitigate this it is suggested that SFN operation of the ABC29 Latrobe Valley and Nowa Nowa services would be desirable.

### 2.9.9 Bruthen — Block E

Bruthen is an ABC and SBS-only site. The currently operating SBS and ABC services are in Blocks B and C respectively. However given the proposed use of Block B at Latrobe Valley, Block D at Orbost and Block C at Bairnsdale, it is proposed that the identified channel block for Bruthen should be Block E.

This would place Bruthen on the same channel block as Lakes Entrance. Interference studies indicate that, despite the closeness of the Lakes Entrance and Bruthen sites, there is significant terrain between the sites and so they can operate compatibly on common channels if required.

### 2.9.10 Cann River — Block E

While predictions[17] indicate that no interference is expected to the Genoa input from any nearby site, Block B should be avoided due to potential interference from Latrobe Valley. It is also desirable, if practical, to avoid pairing with distant high power services on Block A (Melbourne) and Block D (NE Tasmania) that might cause small percentage of time interference over long water paths. Also, as explained below, Genoa is proposed to use Block C. Therefore the proposed channel block for Cann River should be Block E.

VTV and AMV services have been placed on channels 48 and 49, respectively, to avoid an n+5 off-air feed combination between Orbost and Cann River.

### 2.9.11 Mallacoota — Block E

Studies indicate that Mallacoota can operate co-channel with any of Latrobe Valley, Bairnsdale, Orbost or Cann River. Given that Mallacoota digital services currently operate on channels above 55, it is proposed that the identified channel block for Mallacoota should be Block E.

### 2.9.12 Genoa — Block C

Given that Genoa is not a natural Block B site, the proposed use of Block E at Mallacoota, and to avoid any adjacent-channel input issues at Mallacoota, it is proposed that the identified channel block for Genoa should be Block C. Predictions[18] indicate that no interference is expected to the Mallacoota input feed from any nearby site.

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[17] Predictions run with receive antenna heights of 10 m and 70 m at Maramingo Hill (Genoa).

[18] Predictions run with a receive antenna height of 20 m at the Mallacoota transmitter site.

## 2.10 Griffith and the MIA

Table 2.8 shows the proposed block identifications and channel allotments for the main station and repeater sites in the Griffith and the MIA TV1 licence area. . Block identification and channel allotments for the Murrumbidgee Irrigation Area are explained in Section 2.2.11.

A block identification has not been made for Tullibigeal. If channel allotments for these sites are required in the future, they should be made within the framework provided in Table 2.8.

**Table 2.8 Proposed channel allotments for the Griffith and the MIA TV1 licence area**

| Area Served | Pol | 6 | 7 | 8 | 9 | 9A | 10 | 11 | 12 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MURRUMBIDGEE IRRIGATION AREA | V | | | | | | | | | ABC | MTN | AMN | UA | MDN | SBS | | | | | | | | | | | | | | | | | | |
| Hay | H | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMN | MTN | MDN | UA | | | | | | |
| Hillston | V | | | | | | | | | | | | | | | | | | | | | SBS | ABC | AMN | MTN | MDN | UA | | | | | | |

### 2.10.1 Hay — Block D

Given the proposed use of Block B at Murrumbidgee Irrigation Area, and to a lesser extent, the proposed use of Block C at Goulburn Valley and Block E at Murray Valley, it is proposed that the identified channel block for Hay should be Block D.

Use of Block D at Hay will create co-channel pairings with Jerilderie, Deniliquin and Balranald however studies have shown that these pairings are compatible.

### 2.10.2 Hillston — Block D

There are few constraints on channel block identification for Hillston. Given the proposed use of Block B at Murrumbidgee Irrigation Area that block should be avoided, beyond that it seems desirable to avoid Block C which is proposed for use at Central Tablelands and Block E which is proposed for use at Murray Valley and SW Slopes/E Riverina. Therefore, it is proposed that the identified channel block for Hillston should be Block D.

Use of Block D at Hillston will create co-channel pairing with Hay; however, studies have shown that this pairing is compatible.

# 3 Implementation/sequencing considerations

## 3.1 Restack windows

The TLAP instruments for Regional Victoria, Mildura/Sunraysia, and Griffith and the MIA will specify the period for which each channel in these licence areas is allotted. For a service that must restack, the TLAP would show two entries—one for the current channel allotment and a second for the final (post-restack) channel allotment. By overlapping the periods during which the current and final (or post-restack) channels are allotted, a 'timing window' is created within which broadcasters can schedule the actual date for the restack of each site. For services not restacking, only one channel allotment is shown in the TLAP because the pre and post-restack channels will be the same.

The timing window concept is being used as it is not practical to define precise restack dates in the TLAP as any slippage due to equipment delivery or delays due to weather events, or opportunistic advancement of some work when other work is delayed, would require the TLAP to be varied. Broadcasters will need to make adequate contingency allowances in their project planning to ensure site works, equipment deliveries and the actual restack for each site occurs before the end of the timing window.

Additionally, the restack at each site will need to be coordinated between broadcasters to avoid (or minimise) any need for viewers to retune their television(s) multiple times during a restack timing window.

Two different timing window periods are required for sites in the Regional Victoria and Mildura/Sunraysia licence areas. The first timing window is proposed to commence in the second half of 2012 (1 October 2012 to 28 June 2013). The second timing window is proposed to commence at 28 January 2014 and extend to 30 September 2014. The second timing window is required in Regional Victoria because Bendigo and Latrobe Valley, along with other sites that are in turn constrained by Bendigo and Latrobe Valley, are blocked from restacking due to incompatibility with Melbourne region services that will not be switched off or restacked until after ASO for that area in late 2013. The second timing window for Mildura/Sunraysia is required because Ouyen is incompatible with Renmark/Loxton which cannot restack until after Adelaide's ASO and restack also expected in late 2013.

Analog services in the Southern NSW licence area have not been taken into consideration here because they will be switched off by the time the sites discussed in this report will be restacked. For instance, analog services at MIA or SW Slopes/E Riverina which currently prevent MIA from being restacked are not shown as restack constraints for MIA.

## 3.2 Constraints on the restacking of sites

An analysis showing which sites need to be restacked or switched off before other sites can be restacked has been performed. The results of that analysis are summarised in Tables A4.1 and A4.2 in **Appendix A4**, where current constraints (if any) are shown for each service at each site for both proposed restack timing windows.

That analysis found that several categories of sites will not impose constraints on the timing and sequencing of the restack. Of the 82 sites[19] considered in this report, 39 can operate on final post-restack channels at any time from the beginning of the first Regional Victoria restack window on 1 October 2012. These are summarised in Table 3.1.

**Table 3.1: Sites not constrained by currently operating "pre-restack" services**

| **Category** | **Area(s) served** | |
|---|---|---|
| Sites that have no constraints and can be restacked immediately | *Griffith and MIA TV1 licence area* | Hay, Hillston, **Murrumbidgee Irrigation Area** |
| | *Mildura/Sunraysia TV1 licence area* | **Mildura/Sunraysia** |
| | *North-West Victoria* | Balranald, Hopetoun (VIC) |
| | *Central-Western Victoria* | Timboon and Warracknabeal |
| | *South-Western Victoria* | Coleraine, Warrnambool City and **Western Victoria** |
| | *Central-Eastern Victoria* | Alexandra Environs, Eildon, Eildon Town, Bonnie Doon, **Goulburn Valley,** Howqua and Yea. |
| | *North-Eastern Victoria* | Albury North, Bright, Corryong, Falls Creek, Harrietville, Hunters Knob IBL, Khancoban, Kiewa, Kiewa Valley, Mt Stanley IBL, Tawonga South and Walwa/Jingellic, |
| | *Gippsland/Latrobe Valley* | Boolarra, Bruthen, Cann River, Churchill, Genoa, Inverloch, Jeeralang/Yinnar South, Mallacoota and Nowa Nowa. |

Additionally a further 27 sites may also be restacked within the first restack window if:

a) they have only one restack constraint that can be avoided by arranging the channel allotments so that the unallotted channel (or another allotment for a service that is not yet operating eg. SBS at Orbost) is exchanged with the constrained channel. (For instance, channel 40 at Ouyen cannot be used for a restacked service before the digital SBS40 service at Renmark/Loxton ceases. However, if UA and SBS services at Ouyen are swapped, this constraint can be shifted to the UA channel, and the five currently operating broadcaster services at Ouyen can be restacked immediately, regardless of the Renmark/Loxton SBS40 service). Sites in this category are listed in Table 3.2a;
b) they have constraint(s) due to other sites that are being restacked within the first restack window. This requires the sequencing of work at "first restack window" sites

[19] Broadcaster sites, in-band links and sites providing retransmission services (both those operated by RBA Holdings Pty Ltd, and those operated by councils or other community organisations).

to be organised so that sites are restacked in a sequence that does not cause the identified restack constraints to occur. (These are listed in Table 3.2b);

c) the VTV36 channel at Latrobe Valley is restacked within the first restack window (even though other Latrobe Valley channel cannot be restacked at the same time), it will allow Ballarat and 17 associated sites to be restacked in the first restack window[20]. (These sites are listed in Table 3.2c.)

**Table 3.2a: Sites where constraints can be removed by exchanging a constrained channel with an unallotted channel or other notionally reserved channel**

| Area served | Pre-restack service(s) that are constraining access to the unallotted channel |
|---|---|
| Ouyen UA40 | Renmark/Loxton SBS40 |
| Orbost SBS42 | Latrobe Valley ABC42 |
| Warrnambool UA46 | Ballarat AMV46, Terang AMV46 |

**Table 3.2b: Sites that are only constrained by other sites that will be within first restack window**

| Area served | Constraint (Col. 2 sites must restack before col.1 site) |
|---|---|
| Jerilderie | Goulburn Valley |
| Deniliquin | Goulburn Valley |
| **Upper Murray** | MIA |
| Myrtleford | Kiewa Valley, Mt Stanley IBL |
| Seymour | Goulburn Valley, Yea |
| Hopetoun-Beulah | Hopetoun |

**Table 3.2c: Sites that can be included in first restack window (provided Latrobe Valley VTV36 is restacked early)**

| Area served | Constraint (Col. 2 sites must restack before col.1 site) |
|---|---|
| **Ballarat** | VTV36 Latrobe Valley |
| Ballarat East | Ballarat |
| Birchip | Ballarat |
| Casterton | Ballarat, Coleraine, South East SBS40[21] |
| Charlton | Ballarat |
| Cobden | Ballarat, Terang |

[20] If all Latrobe Valley services are to be restacked simultaneously, this cannot occur before at least three of analog SBS28, digital SBS29, analog MGV31 and digital MGV32 cease operating (i.e. Latrobe Valley would need to be restacked in the second timing window). Further, due to incompatibility between Latrobe Valley and Ballarat services, Ballarat cannot be restacked before Latrobe Valley is restacked due to currently operating digital VTV36 and GLV39 services at Latrobe Valley (on Block C). As a consequence Ballarat and the 16 associated sites listed in Table 3.2c will also need to be restacked in the second timing window. Because of this significant potential impact on the overall timeframes within which restack works will need to be completed it is proposed that the Latrobe Valley site should restack in two stages.

In the first stage (2012/13), VTV36 at Latrobe Valley would be restacked to its final channel 31, while in the second stage (in 2014) the GLV39 and ABC42 services at Latrobe Valley would be restacked in the second timing window. This would remove the constraint from Ballarat, and so Ballarat and the 16 associated sites could be restacked in the first timing window.

It should be noted that this proposal assumes that the MGV31 analog community television (CTV) service in Melbourne will have ceased operating by the start of the first proposed restack window, which would make channel 31 available at Latrobe Valley. In August 2011, variations to the relevant Licence Area Plans put into place measures to facilitate, at the metropolitan CTV licensees discretion, an early switch-off of their analog transmissions in Brisbane, Sydney and Melbourne. In addition, the unallotted channel at Bendigo and Latrobe Valley has been aligned with the Melbourne MGV32 digital service to ensure that operation of that service does not impose further restack constraints on any of the five broadcaster services at either site.

| | |
|---|---|
| Cohuna | Ballarat |
| Colac | Ballarat, Terang |
| Halls Gap | Ballarat, Horsham |
| **Horsham** | Ballarat, South East SBS40[21] |
| Lorne | VTV36 Latrobe Valley |
| Mt Cowley IBL | Ballarat |
| **Nhill** | Ballarat, Bordertown SES50[21], Horsham |
| Portland | Ballarat, South East SBS40[21] |
| Tanybryn IBL | Ballarat |
| Terang | Ballarat |
| Warrnambool | Ballarat, Terang |
| Wycheproof | Ballarat |

Studies on the Melbourne TV1 licence area show that the only Regional Victoria sites that could, if paired, cause significant potential interference to some sites in the Melbourne TV1 licence area are Bendigo (Block B), Latrobe Valley (Block B), Ballarat (Block C), Broadford (Block E), Colac (Block E) and the Surf Coast sites.[22]

Interference prediction studies suggest that Colac could potentially cause interference to Rosebud services for low percentages of time. However the current co-channel pairing on channel 51 does not appear to be causing problems so, while the pairing has been avoided in restack channel block identification, it is not considered that this would block the restack of either site.

The proposed Block E channels for Mt Cowley IBL and Tanybryn IBL are not predicted to cause interference to Melbourne TV1 licence area sites that currently operate on Block E, and so Mt Cowley and Tanybryn can restack in the first timing window.

In the other direction, studies of potential constraints on restacking of Regional Victoria licence area sites found that eighteen (3 high power sites and 14 other sites) in the Regional Victoria TV1 licence area cannot be restacked in the first restack window due to various constraints as shown in Table 3.3.

**Table 3.3: Sites constrained by currently operating services which will need to be restacked in the second timing window**

| **Area(s) served** | **Constraint (Col. 2 sites must restack before col.1 sites)** |
|---|---|
| Bendigo and Latrobe Valley (GLV39 & ABC42) | Melbourne |
| Alexandra, Broadford, Koondrook/Barham, Learmonth (VIC), Mansfield, Murray Valley, Waubra | Bendigo |
| Bairnsdale[23], Foster, Newborough and Trafalgar/Yarragon | Latrobe Valley[24] |
| Apollo Bay and Lakes Entrance | NE Tasmania |
| Robinvale and Underbool | Renmark/Loxton |

[21] It is anticipated that Bordertown SES50 and South East SBS40 will be restacked before the Victorian sites listed in this table.

[22] Lorne (Block C), Mt Cowley IBL (Block E), Apollo Bay (Block E) and Tanybryn IBL (Block E).

[23] This site is also constrained not to restack until channels 35 and 38 at NE Tasmania cease operating.

[24] It should be noted that any future Orbost SBS42 digital service cannot commence before the Latrobe Valley ABC42 digital service is restacked.

# Appendix A1 – Planning principles

Note: the wording of principles below have been adjusted to align with the terminology adopted for TLAPs.

***Principle 1:*** *Replan digital television services to use VHF channels 6-12 and UHF channels 28–51.*

***Principle 2:*** *Create a digital radio sub-band, comprising VHF television channels 9 and 9A, that is clear of digital television in metropolitan and regional licence areas. Where practicable, also avoid planning new services on these channels in remote licence areas.*

***Principle 3:*** *Plan for six digital channels at each transmission site, except for*
*i) licence area overlaps where two sets of three commercial services will require channels (a total of nine channels) and;*
*ii) where broadcasters operate from different sites but cover the same area.*

**Principles 4–6 define the essential elements of the block planning approach.**

***Principle 4:*** *Plan channels so that viewers in metropolitan and regional licence areas can receive all services using a single band antenna (i.e. plan all channels in either the VHF or UHF band). Consider the benefit of single band operation in other areas on a case-by-case basis. The current polarisation of the existing transmissions in a particular band at each transmission site is to be maintained.*

***Principle 5:*** *Plan all six services on channels within defined blocks of channels as follows:*
*Block A: 6, 7, 8, 10, 11 and 12**
*Block B: 28, 29, 30, 31, 32 and 33*
*Block C: 34, 35, 36, 37, 38 and 39*
*Block D: 40, 41, 42, 43, 44 and 45*
*Block E: 46, 47, 48, 49, 50, and 51.*
** Channels 9 and 9A may be used for digital TV in some remote areas.*

***Principle 6:*** *Allot channels within a block as follows:*

*VHF: Existing VHF services to retain current channels unless they have to move to clear channels 9 and 9A under principle 2. New or changed channel allotments do not need to follow any particular order, except in all Metropolitan areas where SBS should move to channel 7. Where it is possible without moving existing services, channel 10 should be the unallotted channel to align with the metropolitan area unallotted channel.*

*UHF: Channel allotments should be made after considering and balancing a number of objectives including:*

- *avoiding off-air input issues (adjacent channel and N+5)*
- *avoiding changes to existing services within the block*
- *using the unallotted channel to remove restack timing constraints and manage band edge interference potential.*

*If none of the above issues apply, UHF channels should be allotted in the following order: SBS, ABC, Seven (or affiliate), Nine (or affiliate), Ten (or affiliate), Unallotted.*

***Principle 7:*** *In selecting the channel block for a transmission site:*

- *Consider the channels used by existing digital services and any information available on the operating frequency range of broadcaster transmission equipment.*
- *Avoid use of a block outside the likely bandwidth of viewer antennas. In particular, avoid block B where there is no current or past use of UHF Band IV channels. Where this cannot be avoided, minimise the total population affected.*
- *Wherever sites utilise UHF channel blocks, attempt to place high power services on lower UHF channel blocks.*

***Principle 8:*** *Break up wide area single frequency networks (SFNs) known to have associated reception problems and minimise use of new SFNs where possible.*

***Principle 9:*** *Plan on the basis of broadcasters using the DVB-T standard with transmission parameters of 8k, 64QAM, 2/3 forward error correction (FEC) and 1/16 guard interval.*

The co-channel protection ratio used for planning will be: 20 dB

The minimum median field strengths used for planning will be:

**Minimum median field strengths for digital television planning (dBµV/m)**

| | VHF (Block A) (174-230 MHz) | | | UHF (Blocks B and C) (526-610 MHz) | | | UHF (Blocks D and E) (610-694 MHz) | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Rural** | **Suburban** | **Urban** | **Rural** | **Suburban** | **Urban** | **Rural** | **Suburban** | **Urban** |
| Minimum median field strength (dBuV/m) | 44 | 57 | 66 | 50 | 63 | 71 | 54 | 67 | 74 |

Consistent with the reconfirmation of the existing technical planning parameters, the assumed transmission parameters include an FEC of 2/3. Also consistent with the reconfirmation of the current minimum median field strengths and 2/3 FEC, a co-channel protection ratio of 20 dB will also continue to be used.

However, recognising the proposal to break up wide area SFNs in principle 8, a 1/16 guard interval has been adopted.

***Principle 10:*** *Equalise transmissions across all broadcasters as far as practicable through planning on the basis of equal ERP levels, identical antenna patterns, closely sited transmitters and all broadcasters having the same SFN arrangement.*

***Principle 11:*** *Determine the timing constraints on channel availability and specify a minimum window of six months, where practicable, when both the current digital and the final digital channels are available. When all sites and timing windows are considered together, they should result in the digital dividend channels (52–69) being cleared as soon as practicable, and by the end of 2014 at the latest.*

# Appendix A2 – Proposed channel plan

*(Appendix A2 can be found as a separate attachment to this report)*

# Appendix A3 - Maps

Note well: The following maps provide a general indication of the areas that may be covered by each transmitter, but several important disclaimers should be noted.

1) The presentation does not take account of predicted interference between services;
2) The presentation has used the CRC Predict diffraction based propagation model. The predictions use best available information about nominal ERP levels and antenna patterns;
3) The maps provide a simple "max server" presentation which, in the case of locations in area of overlaps between two coverages, will ascribe coverage to the transmitter that provides the highest "Band V equivalent" field strength at the point in question. (Note: This max server presentation is based purely on field strength comparisons it does not consider whether the received field strengths are interference-free, nor does it consider viewer preferences for one site over another);
4) Maps for different areas abut (or overlap). To improve the insights provided by the maps predicted coverages of some sites near map region boundaries have been repeated on more than one map.

These maps SHOULD NOT BE USED to provide advice about the coverage of particular transmitters. For that purpose reader should refer to the MySwitch digital coverage tool at: http://myswitch.digitalready.gov.au/

**Figure A3.1 OVERVIEW MAP SHOWING REGIONS COVERED IN THIS REPORT**

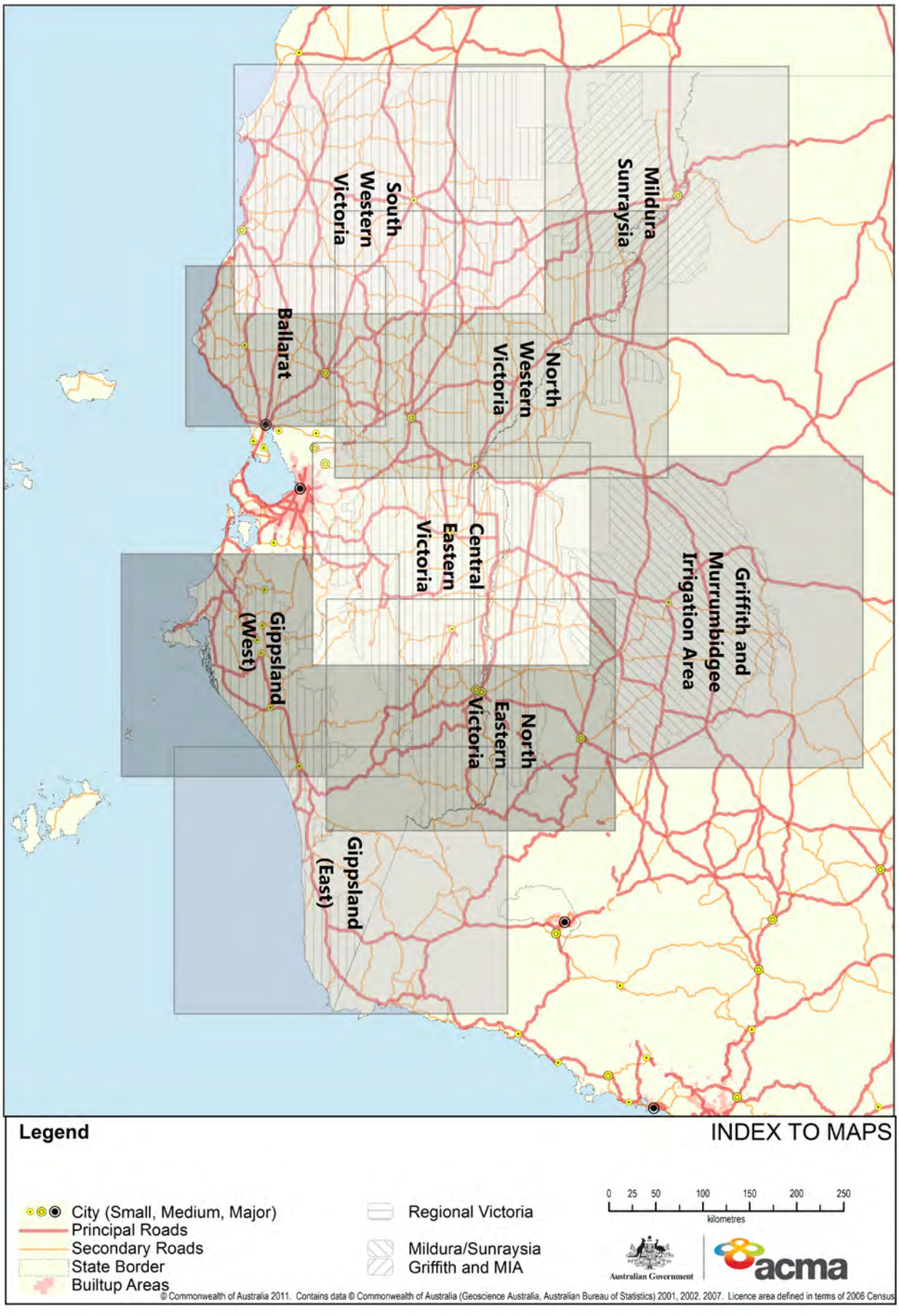


**Figure A3.2 MILDURA/SUNRAYSIA**

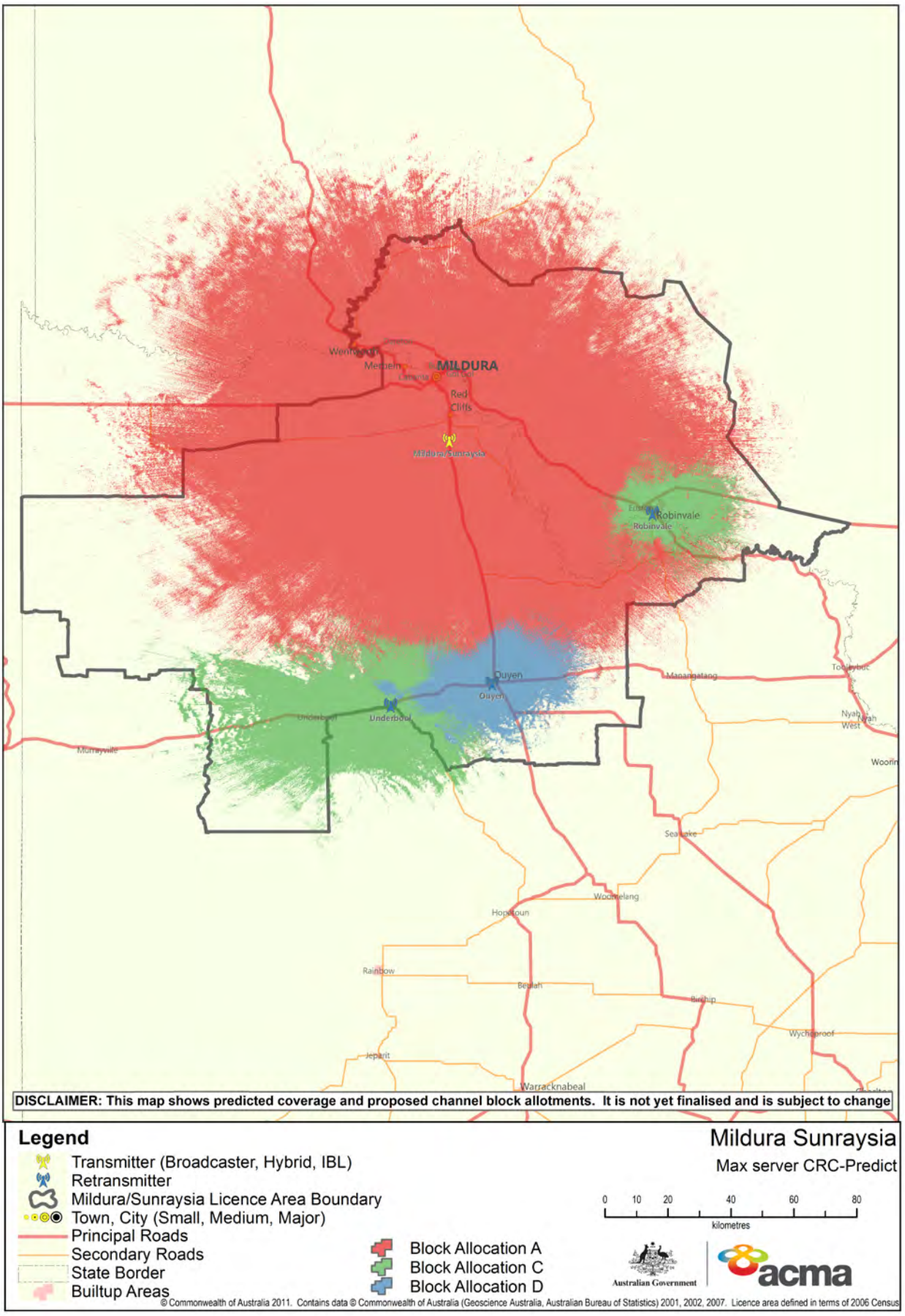


**Figure A3.3 NORTH –WEST VICTORIA**

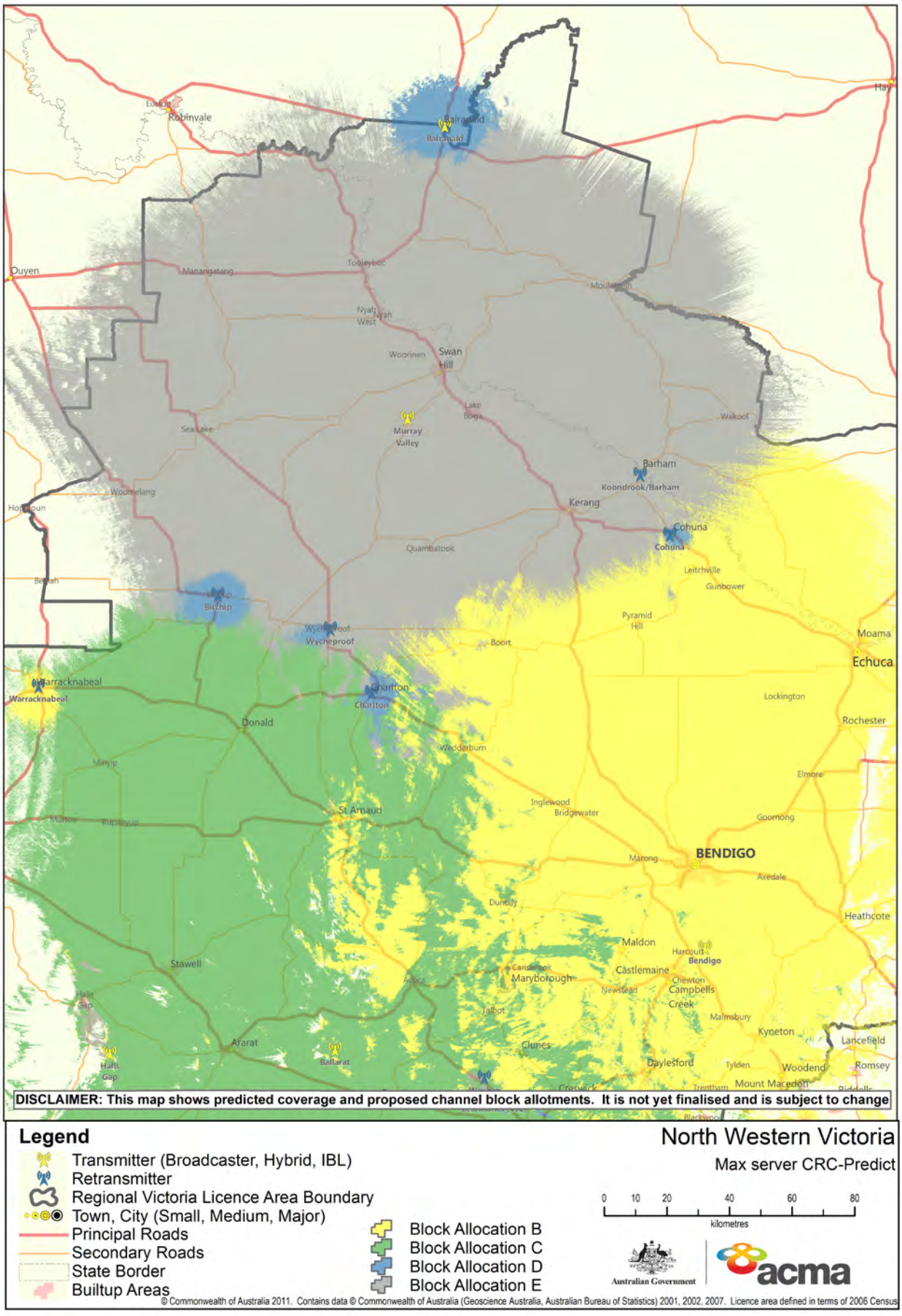


**Figure A3.4 SOUTH-WEST VICTORIA**

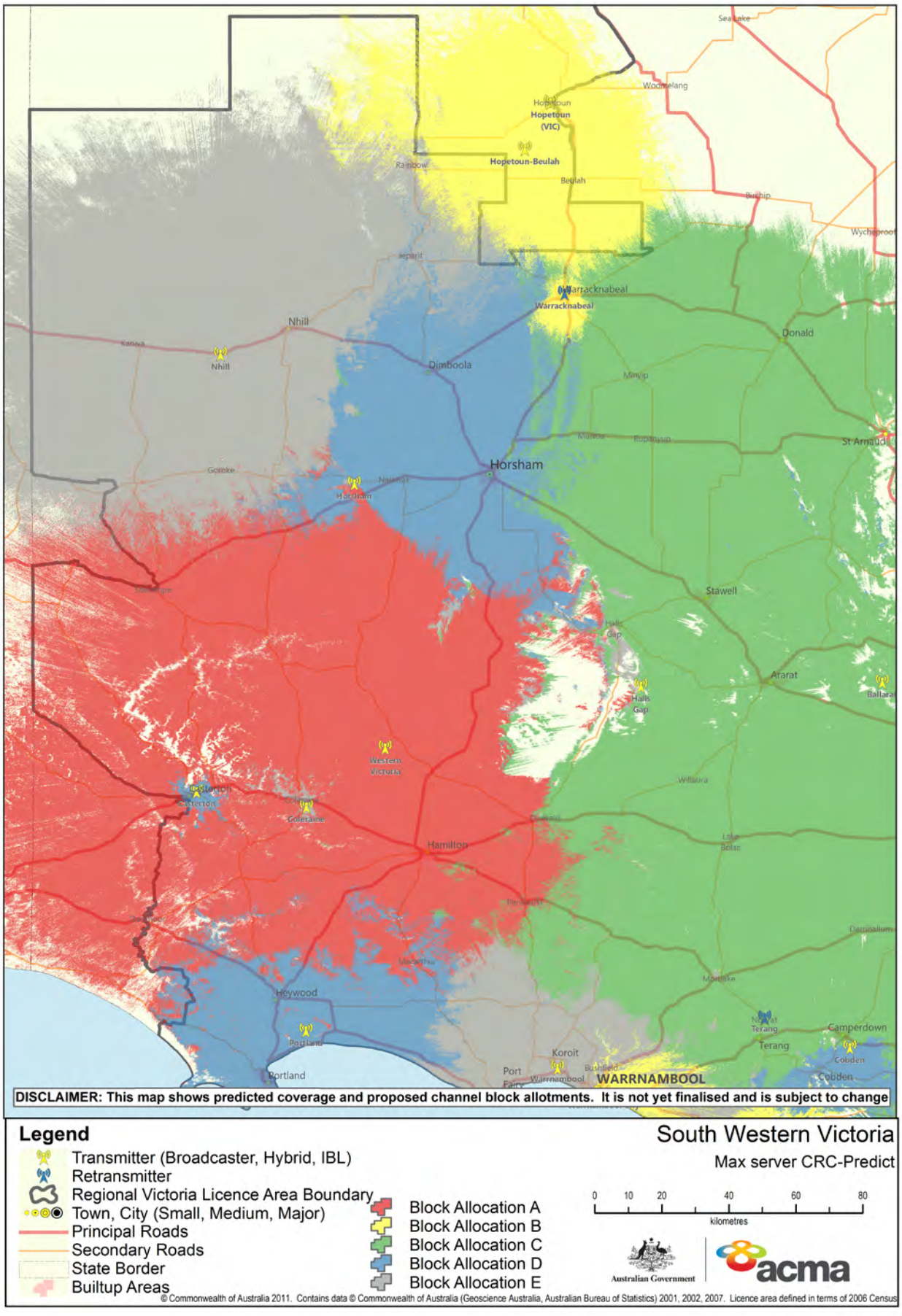


**Figure A3.5 BALLARAT**

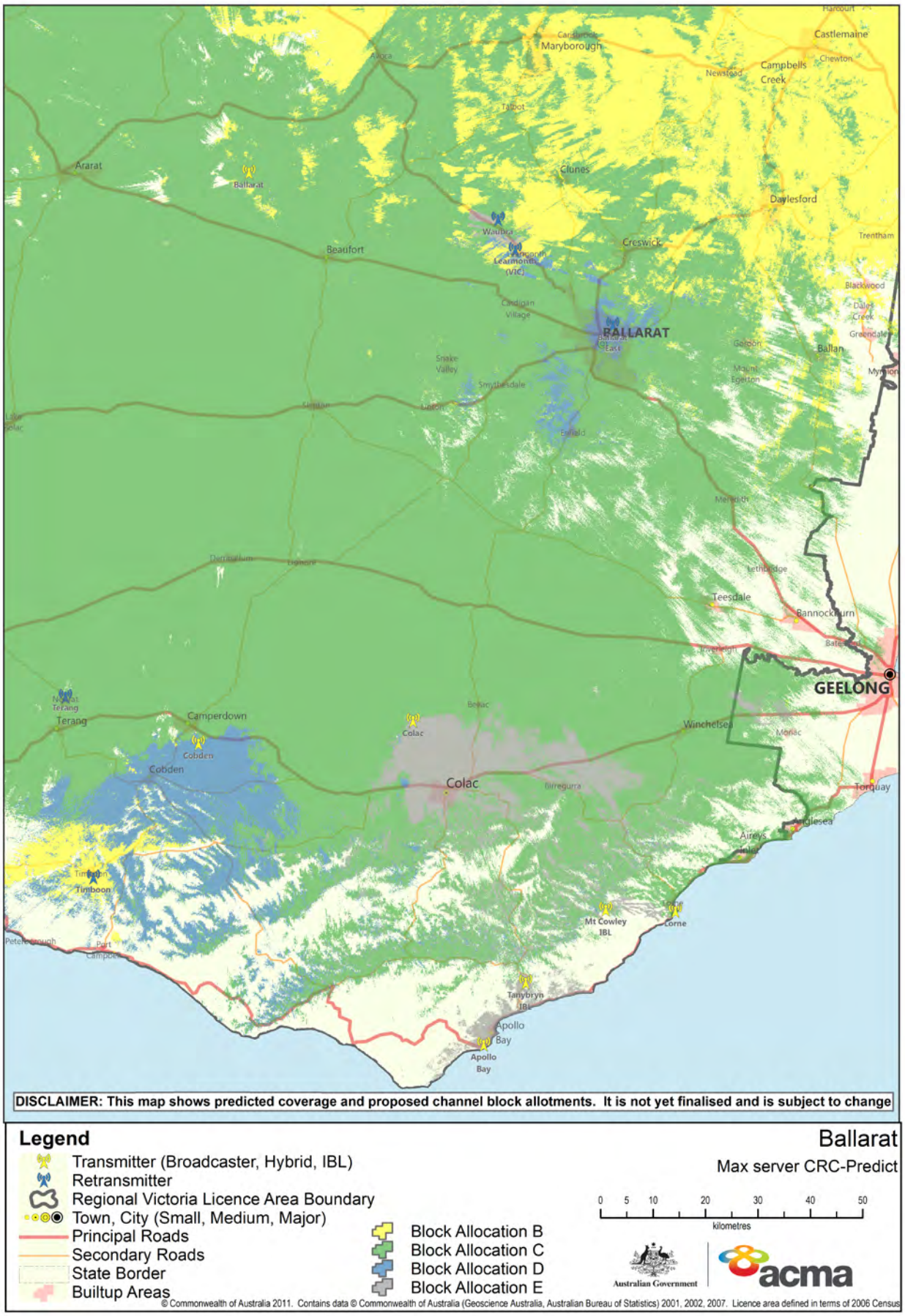


**Figure A3.6 CENTRAL-EASTERN VICTORIA**

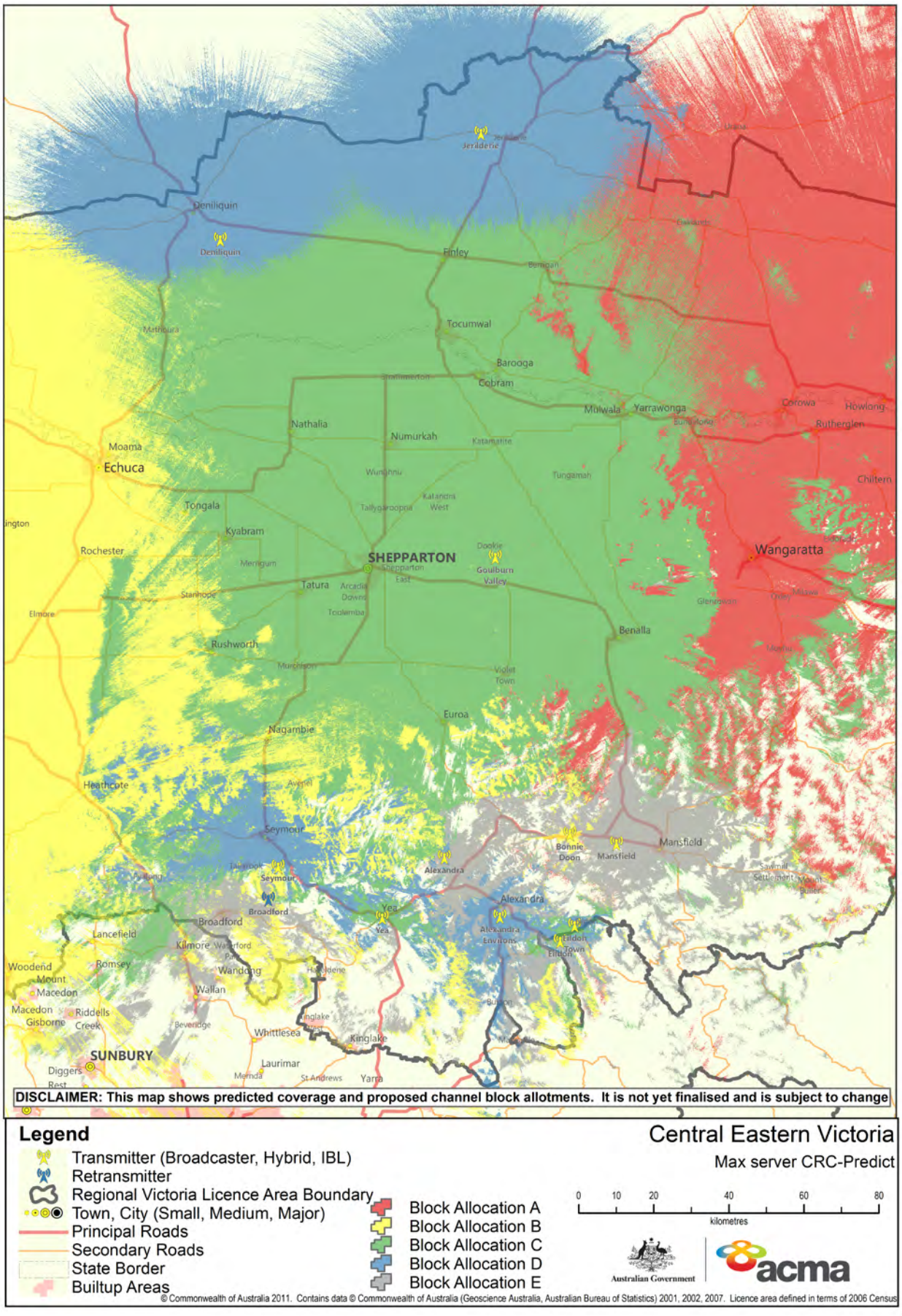


**Figure A3.7 NORTH –EAST VICTORIA**

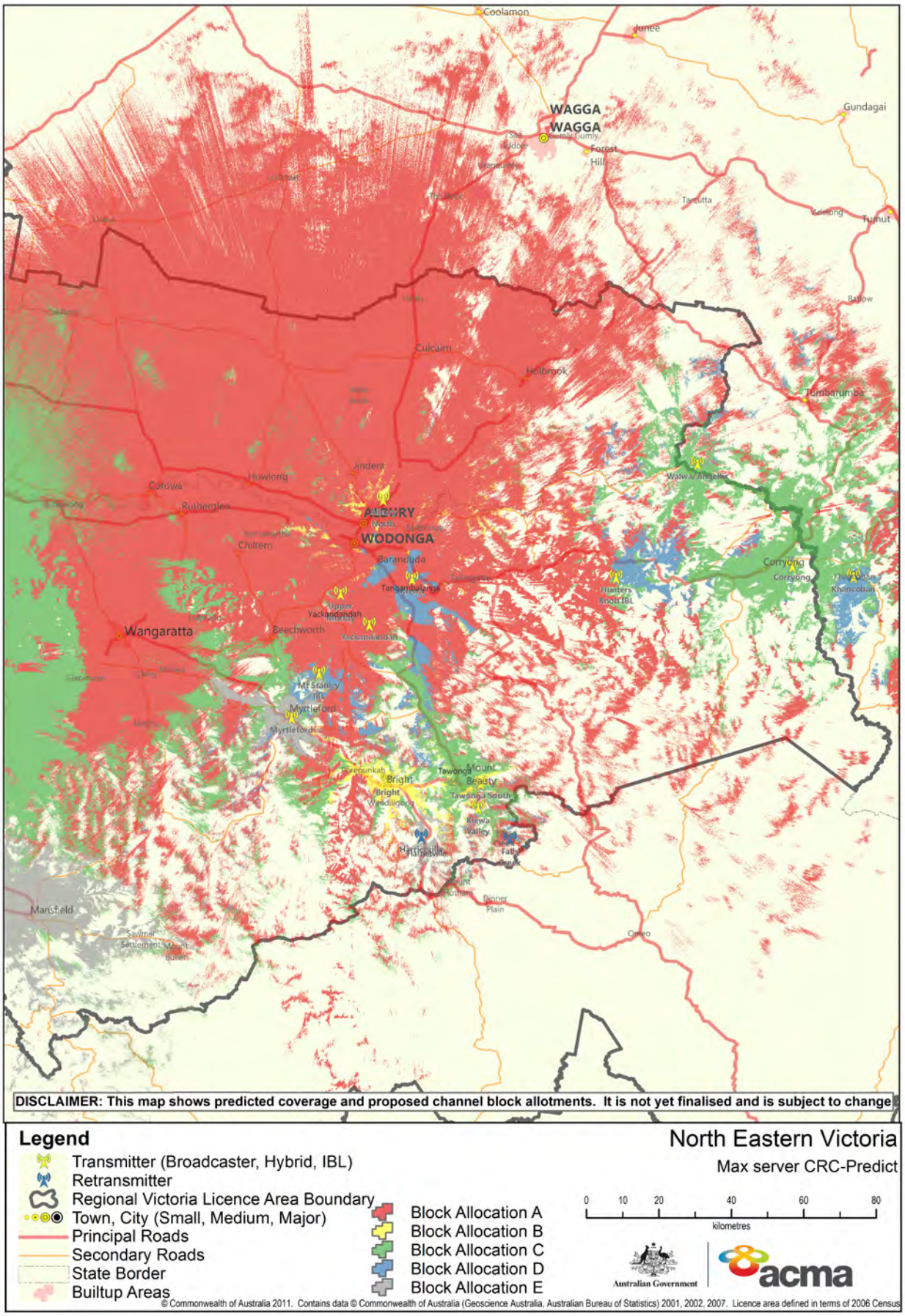


**Figure A3.8 WEST GIPPSLAND**

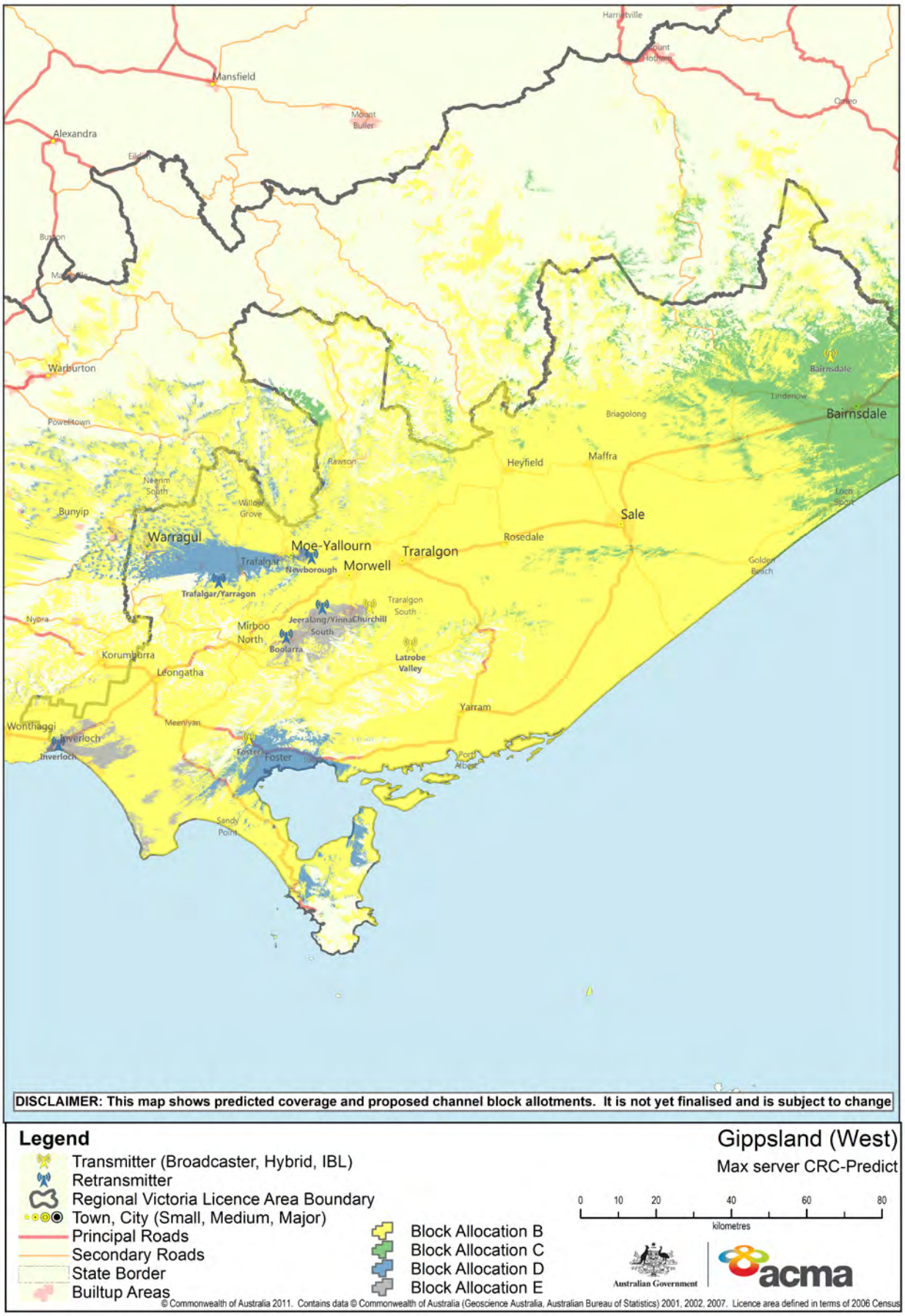


**Figure A3.9 EAST GIPPSLAND**

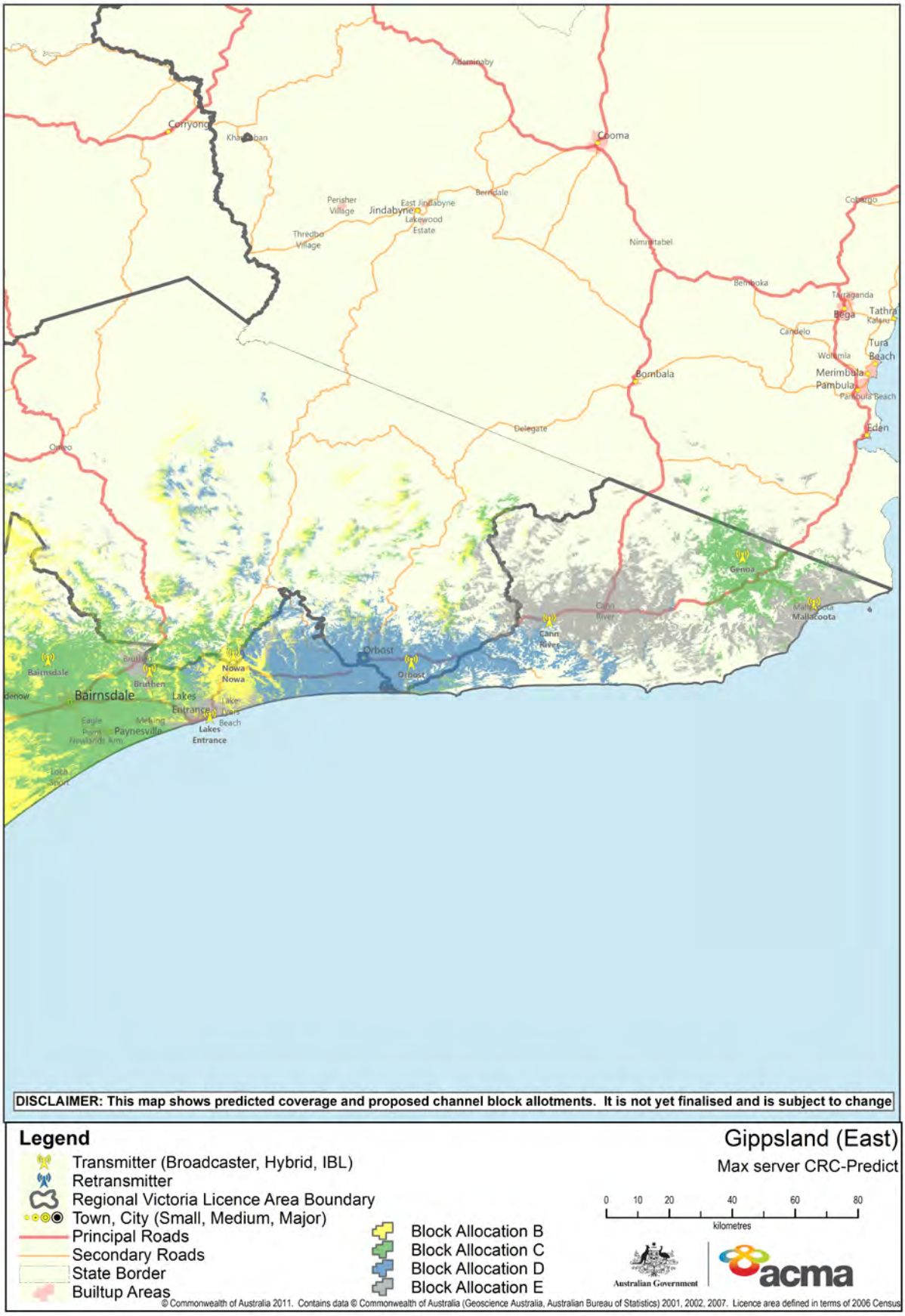
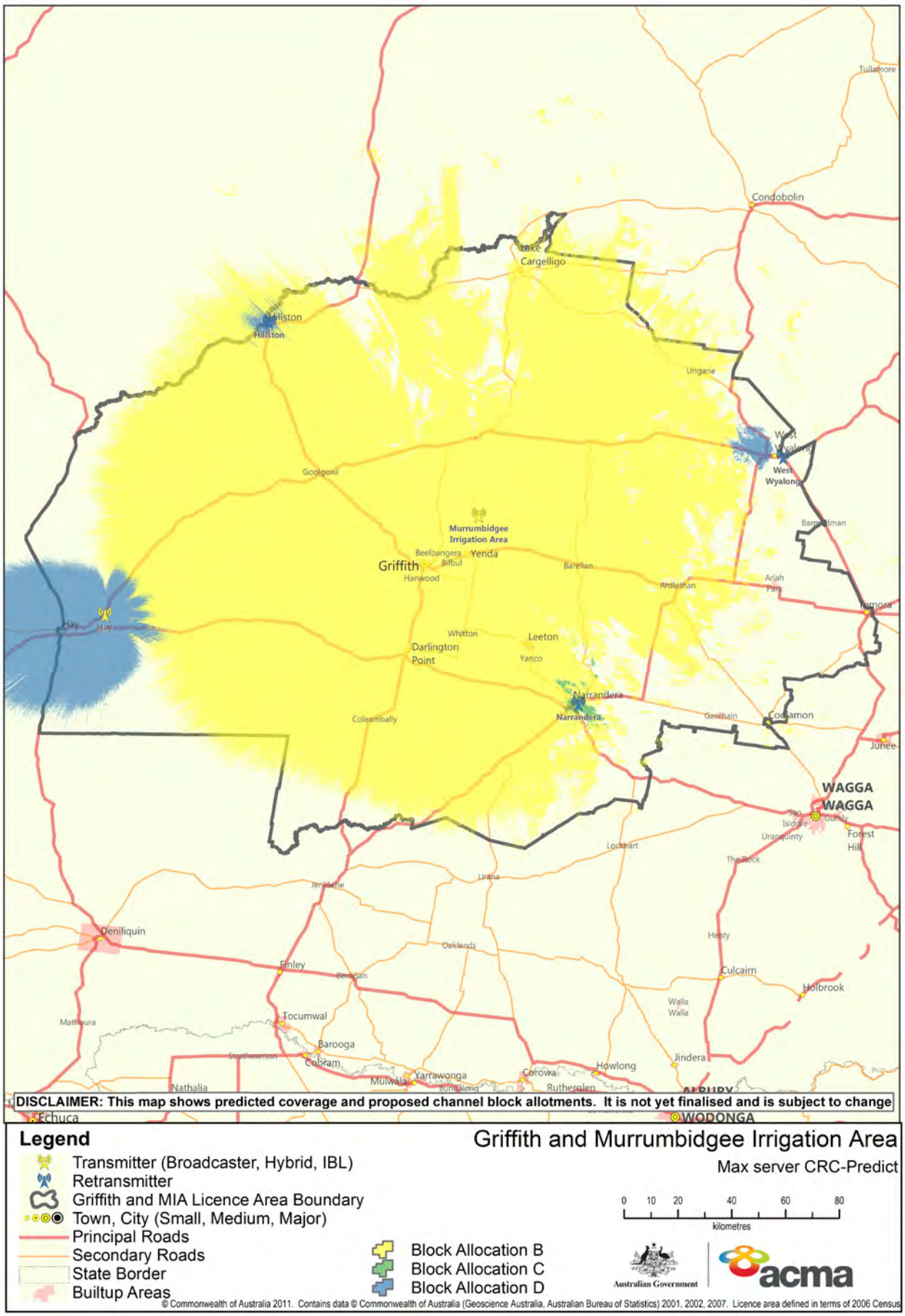


**Figure A3.10 GRIFFITH AND MIA**



# 4 Appendix A4 – Service-by-service constraint analysis

**Table A4.1: Services to be restacked within first restack timing window – 1 October 2012 – 28 June 2013**

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Albury North | AMV | 58 | 28 | No constraints. |
| Albury North | SBS | 29 | 29 | No constraints. |
| Albury North | VTV | 61 | 30 | No constraints. |
| Albury North | ABC | 31 | 31 | No constraints. |
| Albury North | GLV | 64 | 32 | No constraints. |
| Albury North | UA | | 33 | No constraints. |
| Alexandra Environs | ABC | 32 | 41 | No constraints. |
| Alexandra Environs | SBS | 29 | 42 | No constraints. |
| BALLARAT | SBS | 43 | 34 | Must restack after digital Hopetoun-Beulah ABC34 restack (but refer to section 2.4.8) |
| BALLARAT | ABC | 41 | 35 | No constraints. |
| BALLARAT | AMV | 46 | 36 | Must restack after digital LATROBE VALLEY VTV36 restack. |
| BALLARAT | VTV | 37 | 37 | No constraints. |
| BALLARAT | BCV | 40 | 38 | No constraints. |
| BALLARAT | UA | | 39 | May not commence before digital LATROBE VALLEY GLV39, SOUTH EAST ABC39 restack. |
| Ballarat East | SBS | 55 | 40 | Must restack after digital BALLARAT BCV40 restack. |
| Ballarat East | ABC | 67 | 41 | Must restack after digital BALLARAT ABC41 restack. |
| Ballarat East | AMV | 64 | 42 | No constraints. |
| Ballarat East | VTV | 58 | 43 | Must restack after digital BALLARAT SBS43 restack. |
| Ballarat East | BCV | 61 | 44 | No constraints. |
| Ballarat East | UA | | 45 | No constraints. |
| Balranald | ABC | 40 | 40 | No constraints. |
| Balranald | BCV | 41 | 41 | No constraints. |
| Balranald | AMV | 37 | 42 | No constraints. |
| Balranald | SBS | 43 | 43 | No constraints. |
| Balranald | VTV | 56 | 44 | No constraints. |
| Balranald | UA | | 45 | No constraints. |
| Birchip | SBS | 69 | 40 | Must restack after digital BALLARAT BCV40 restack. |
| Birchip | ABC | 68 | 41 | Must restack after digital BALLARAT ABC41 restack. |
| Birchip | AMV | 53 | 42 | No constraints. |
| Birchip | VTV | 52 | 43 | Must restack after digital BALLARAT SBS43 restack. |
| Birchip | BCV | 55 | 44 | No constraints. |
| Birchip | UA | | 45 | No constraints. |
| Bonnie Doon | UA | | 28 | No constraints. |
| Bonnie Doon | SBS | 29 | 29 | No constraints. |
| Bonnie Doon | GLV | 30 | 30 | No constraints. |
| Bonnie Doon | VTV | 35 | 31 | No constraints. |
| Bonnie Doon | ABC | 32 | 32 | No constraints. |
| Bonnie Doon | AMV | 33 | 33 | No constraints. |
| Boolarra | AMV | 67 | 46 | No constraints. |
| Boolarra | GLV | 53 | 47 | No constraints. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Boolarra | UA | | 48 | No constraints. |
| Boolarra | ABC | 49 | 49 | No constraints. |
| Boolarra | VTV | 50 | 50 | No constraints. |
| Boolarra | SBS | 51 | 51 | No constraints. |
| Bright | SBS | 28 | 28 | No constraints. |
| Bright | AMV | 34 | 29 | No constraints. |
| Bright | VTV | 40 | 30 | No constraints. |
| Bright | ABC | 31 | 31 | No constraints. |
| Bright | GLV | 36 | 32 | No constraints. |
| Bright | UA | | 33 | No constraints. |
| Bruthen | SBS | 28 | 46 | No constraints. |
| Bruthen | ABC | 38 | 47 | No constraints. |
| Cann River | SBS | | 46 | No constraints. |
| Cann River | ABC | 12 | 47 | No constraints. |
| Cann River | VTV | 55 | 48 | No constraints. |
| Cann River | AMV | 53 | 49 | No constraints. |
| Cann River | GLV | 9A | 50 | No constraints. |
| Cann River | UA | | 51 | No constraints. |
| Casterton | SBS | | 40 | May not commence before digital SOUTH EAST SBS40, BALLARAT BCV40 restack. |
| Casterton | ABC | 54 | 41 | Must restack after digital BALLARAT ABC41 restack. |
| Casterton | AMV | 63 | 42 | Must restack after digital Coleraine ABC42 restack. |
| Casterton | VTV | 66 | 43 | Must restack after digital BALLARAT SBS43 restack. |
| Casterton | BCV | 60 | 44 | No constraints. |
| Casterton | UA | | 45 | No constraints. |
| Charlton | SBS | 69 | 40 | Must restack after digital BALLARAT BCV40 restack. |
| Charlton | ABC | 68 | 41 | Must restack after digital BALLARAT ABC41 restack. |
| Charlton | AMV | 53 | 42 | No constraints. |
| Charlton | VTV | 52 | 43 | Must restack after digital BALLARAT SBS43 restack. |
| Charlton | BCV | 55 | 44 | No constraints. |
| Charlton | UA | | 45 | No constraints. |
| Churchill | AMV | 67 | 46 | No constraints. |
| Churchill | GLV | 53 | 47 | No constraints. |
| Churchill | UA | | 48 | No constraints. |
| Churchill | ABC | 49 | 49 | No constraints. |
| Churchill | VTV | 50 | 50 | No constraints. |
| Churchill | SBS | 51 | 51 | No constraints. |
| Cobden | SBS | 68 | 40 | Must restack after digital BALLARAT BCV40, Terang BCV40 restack. |
| Cobden | ABC | 59 | 41 | Must restack after digital BALLARAT ABC41, Terang ABC41 restack. |
| Cobden | AMV | 65 | 42 | No constraints. |
| Cobden | VTV | 56 | 43 | Must restack after digital BALLARAT SBS43, Terang SBS43 restack. |
| Cobden | BCV | 62 | 44 | No constraints. |
| Cobden | UA | | 45 | May not commence before digital Warrnambool VTV45 restack. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Cohuna | SBS | 59 | 40 | Must restack after digital BALLARAT BCV40 restack. |
| Cohuna | ABC | 58 | 41 | Must restack after digital BALLARAT ABC41 restack. |
| Cohuna | AMV | 62 | 42 | No constraints. |
| Cohuna | VTV | 60 | 43 | Must restack after digital BALLARAT SBS43 restack. |
| Cohuna | BCV | 65 | 44 | No constraints. |
| Cohuna | UA | | 45 | No constraints. |
| Colac | SBS | 53 | 46 | Must restack after digital BALLARAT AMV46, Terang AMV46 restack. |
| Colac | ABC | 52 | 47 | No constraints. |
| Colac | VTV | 48 | 48 | No constraints. |
| Colac | UA | | 49 | No constraints. |
| Colac | BCV | 50 | 50 | No constraints. |
| Colac | AMV | 51 | 51 | No constraints. |
| Coleraine | ABC | 42 | 47 | No constraints. |
| Corryong | GLV | 34 | 34 | No constraints. |
| Corryong | UA | | 35 | No constraints. |
| Corryong | ABC | 32 | 36 | No constraints. |
| Corryong | AMV | 37 | 37 | No constraints. |
| Corryong | VTV | 40 | 38 | No constraints. |
| Corryong | SBS | | 39 | No constraints. |
| Deniliquin | SBS | 50 | 40 | No constraints. |
| Deniliquin | ABC | 55 | 41 | No constraints. |
| Deniliquin | AMV | 47 | 42 | Must restack after digital GOULBURN VALLEY GLV42 restack. |
| Deniliquin | VTV | 61 | 43 | No constraints. |
| Deniliquin | GLV | 64 | 44 | No constraints. |
| Deniliquin | UA | | 45 | May not commence before digital GOULBURN VALLEY AMV45 restack. |
| Eildon | ABC | 34 | 34 | No constraints. |
| Eildon | AMV | 46 | 35 | No constraints. |
| Eildon | VTV | 40 | 36 | No constraints. |
| Eildon | SBS | 37 | 37 | No constraints. |
| Eildon | GLV | 43 | 38 | No constraints. |
| Eildon | UA | | 39 | No constraints. |
| Eildon Town | ABC | 58 | 41 | No constraints. |
| Eildon Town | SBS | 53 | 42 | No constraints. |
| Falls Creek | SBS | 65 | 40 | No constraints. |
| Falls Creek | ABC | 56 | 41 | No constraints. |
| Falls Creek | AMV | 62 | 42 | No constraints. |
| Falls Creek | VTV | 59 | 43 | No constraints. |
| Falls Creek | GLV | 68 | 44 | No constraints. |
| Falls Creek | UA | | 45 | No constraints. |
| Genoa | UA | | 34 | No constraints. |
| Genoa | SBS | | 35 | No constraints. |
| Genoa | ABC | 30 | 36 | No constraints. |
| Genoa | VTV | 44 | 37 | No constraints. |
| Genoa | GLV | 33 | 38 | No constraints. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Genoa | AMV | 39 | 39 | No constraints. |
| GOULBURN VALLEY | AMV | 45 | 34 | No constraints. |
| GOULBURN VALLEY | VTV | 9 | 35 | No constraints. |
| GOULBURN VALLEY | SBS | 36 | 36 | No constraints. |
| GOULBURN VALLEY | ABC | 37 | 37 | No constraints. |
| GOULBURN VALLEY | GLV | 42 | 38 | No constraints. |
| GOULBURN VALLEY | UA | | 39 | No constraints. |
| Halls Gap | SBS | | 46 | May not commence before digital BALLARAT AMV46 restack. |
| Halls Gap | ABC | 54 | 47 | No constraints. |
| Halls Gap | AMV | 63 | 48 | No constraints. |
| Halls Gap | VTV | 57 | 49 | Must restack after digital HORSHAM SBS49 restack. |
| Halls Gap | BCV | 60 | 50 | No constraints. |
| Halls Gap | UA | | 51 | No constraints. |
| Harrietville | SBS | 58 | 46 | No constraints. |
| Harrietville | ABC | 55 | 47 | No constraints. |
| Harrietville | AMV | 67 | 48 | No constraints. |
| Harrietville | VTV | 61 | 49 | No constraints. |
| Harrietville | GLV | 64 | 50 | No constraints. |
| Harrietville | UA | | 51 | No constraints. |
| Hay | SBS | 61 | 40 | No constraints. |
| Hay | ABC | 55 | 41 | No constraints. |
| Hay | AMN | 42 | 42 | No constraints. |
| Hay | MTN | 56 | 43 | No constraints. |
| Hay | MDN | 44 | 44 | No constraints. |
| Hay | UA | | 45 | No constraints. |
| Hillston | SBS | | 40 | No constraints. |
| Hillston | ABC | | 41 | No constraints. |
| Hillston | AMN | | 42 | No constraints. |
| Hillston | MTN | | 43 | No constraints. |
| Hillston | MDN | | 44 | No constraints. |
| Hillston | UA | | 45 | No constraints. |
| Hopetoun (VIC) | AMV | 28 | 28 | No constraints. |
| Hopetoun (VIC) | SBS | | 29 | No constraints. |
| Hopetoun (VIC) | VTV | 36 | 30 | No constraints. |
| Hopetoun (VIC) | BCV | 33 | 31 | No constraints. |
| Hopetoun (VIC) | UA | | 32 | No constraints. |
| Hopetoun (VIC) | ABC | | 33 | No constraints (but refer to section 2.4.8). |
| Hopetoun-Beulah | ABC | 34 | 33 | Must restack after digital Hopetoun (VIC) BCV33 restack (but refer to section 2.4.8). |
| HORSHAM | SBS | 49 | 40 | Must restack after digital BALLARAT BCV40, SOUTH EAST SBS40 restack. |
| HORSHAM | ABC | 55 | 41 | Must restack after digital BALLARAT ABC41 restack. |
| HORSHAM | AMV | 53 | 42 | No constraints. |
| HORSHAM | VTV | 52 | 43 | Must restack after digital BALLARAT SBS43 restack. |
| HORSHAM | BCV | 56 | 44 | No constraints. |
| HORSHAM | UA | | 45 | No constraints. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Howqua | VTV | 34 | 34 | No constraints. |
| Howqua | SBS | 28 | 35 | No constraints. |
| Howqua | ABC | 31 | 36 | No constraints. |
| Howqua | AMV | 37 | 37 | No constraints. |
| Howqua | GLV | 38 | 38 | No constraints. |
| Howqua | UA | | 39 | No constraints. |
| Hunters Knob IBL | GLV | 48 | 41 | No constraints. |
| Hunters Knob IBL | AMV | 51 | 43 | No constraints. |
| Hunters Knob IBL | VTV | 45 | 44 | No constraints. |
| Inverloch | SBS | 59 | 46 | No constraints. |
| Inverloch | ABC | 56 | 47 | No constraints. |
| Inverloch | AMV | 62 | 48 | No constraints. |
| Inverloch | VTV | 65 | 49 | No constraints. |
| Inverloch | GLV | 53 | 50 | No constraints. |
| Inverloch | UA | | 51 | No constraints. |
| Jeeralang/Yinnar South | AMV | 67 | 46 | No constraints. |
| Jeeralang/Yinnar South | GLV | 53 | 47 | No constraints. |
| Jeeralang/Yinnar South | UA | | 48 | No constraints. |
| Jeeralang/Yinnar South | ABC | 49 | 49 | No constraints. |
| Jeeralang/Yinnar South | VTV | 50 | 50 | No constraints. |
| Jeeralang/Yinnar South | SBS | 51 | 51 | No constraints. |
| Jerilderie | SBS | 60 | 40 | No constraints. |
| Jerilderie | ABC | 55 | 41 | No constraints. |
| Jerilderie | AMV | 63 | 42 | Must restack after digital GOULBURN VALLEY GLV42 restack. |
| Jerilderie | VTV | 57 | 43 | No constraints. |
| Jerilderie | GLV | 66 | 44 | No constraints. |
| Jerilderie | UA | | 45 | May not commence before digital GOULBURN VALLEY AMV45 restack. |
| Khancoban | ABC | 59 | 46 | No constraints. |
| Khancoban | AMV | 53 | 47 | No constraints. |
| Khancoban | VTV | 62 | 48 | No constraints. |
| Khancoban | GLV | 65 | 49 | No constraints. |
| Khancoban | SBS | 50 | 50 | No constraints. |
| Khancoban | UA | | 51 | No constraints. |
| Kiewa | SBS | 36 | 40 | No constraints. |
| Kiewa | ABC | 41 | 41 | No constraints. |
| Kiewa | VTV | 46 | 42 | No constraints. |
| Kiewa | GLV | 47 | 43 | No constraints. |
| Kiewa | AMV | 44 | 44 | No constraints. |
| Kiewa | UA | | 45 | No constraints. |
| Kiewa Valley | VTV | 67 | 37 | No constraints. |
| Kiewa Valley | GLV | 55 | 38 | No constraints. |
| Kiewa Valley | AMV | 50 | 39 | No constraints. |
| LATROBE VALLEY | VTV | 36 | 31 | Must restack after analog MELBOURNE MGV31 switch-off. |
| Lorne | SBS | 69 | 34 | No constraints. |
| Lorne | ABC | 58 | 35 | No constraints. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Lorne | AMV | 67 | 36 | Must restack after digital LATROBE VALLEY VTV36 restack. |
| Lorne | VTV | 64 | 37 | No constraints. |
| Lorne | BCV | 66 | 38 | No constraints. |
| Lorne | UA | | 39 | May not commence before digital LATROBE VALLEY GLV39 restack. |
| MILDURA/SUNRAYSIA | PTV | 31 | 6 | No constraints. |
| MILDURA/SUNRAYSIA | STV | 7 | 7 | No constraints. |
| MILDURA/SUNRAYSIA | SBS | 28 | 8 | No constraints. |
| MILDURA/SUNRAYSIA | MDV | 33 | 10 | No constraints. |
| MILDURA/SUNRAYSIA | ABC | 11 | 11 | No constraints. |
| MILDURA/SUNRAYSIA | UA | | 12 | No constraints. |
| Mt Cowley IBL | SBS | 69 | 46 | Must restack after digital BALLARAT AMV46 restack. |
| Mt Cowley IBL | AMV | 67 | 47 | No constraints. |
| Mt Cowley IBL | VTV | 64 | 48 | No constraints. |
| Mt Cowley IBL | BCV | 66 | 49 | No constraints. |
| Mt Stanley IBL | GLV | 48 | 41 | No constraints. |
| Mt Stanley IBL | AMV | 51 | 43 | No constraints. |
| Mt Stanley IBL | VTV | 44 | 44 | No constraints. |
| MURRUMBIDGEE IRRIGATION AREA | ABC | 11 | 28 | No constraints. |
| MURRUMBIDGEE IRRIGATION AREA | MTN | 6 | 29 | No constraints. |
| MURRUMBIDGEE IRRIGATION AREA | AMN | 30 | 30 | No constraints. |
| MURRUMBIDGEE IRRIGATION AREA | UA | | 31 | No constraints. |
| MURRUMBIDGEE IRRIGATION AREA | MDN | 32 | 32 | No constraints. |
| MURRUMBIDGEE IRRIGATION AREA | SBS | 33 | 33 | No constraints. |
| Myrtleford | SBS | 58 | 46 | No constraints. |
| Myrtleford | ABC | 53 | 47 | No constraints. |
| Myrtleford | VTV | 61 | 48 | Must restack after digital Mt Stanley IBL GLV48 restack. |
| Myrtleford | AMV | 54 | 49 | No constraints. |
| Myrtleford | GLV | 64 | 50 | Must restack after digital Kiewa Valley AMV50 restack. |
| Myrtleford | UA | | 51 | May not commence before digital Mt Stanley IBL AMV51 restack. |
| NHILL | SBS | 67 | 46 | Must restack after digital BALLARAT AMV46 restack. |
| NHILL | ABC | 66 | 47 | No constraints. |
| NHILL | AMV | 61 | 48 | No constraints. |
| NHILL | VTV | 63 | 49 | Must restack after digital HORSHAM SBS49 restack. |
| NHILL | BCV | 64 | 50 | Must restack after digital Bordertown SES50 restack. |
| NHILL | UA | | 51 | No constraints. |
| Nowa Nowa | ABC | 51 | 29 | No constraints. |
| Orbost | GLV | 38 | 40 | No constraints. |
| Orbost | ABC | 37 | 41 | No constraints. |
| Orbost | SBS | | 42 | May not commence before digital LATROBE VALLEY ABC42 restack. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Orbost | AMV | 43 | 43 | No constraints. |
| Orbost | VTV | 44 | 44 | No constraints. |
| Orbost | UA | | 45 | No constraints. |
| Ouyen | UA | | 40 | May not commence before digital RENMARK/LOXTON SBS40 restack. |
| Ouyen | STV | 41 | 41 | No constraints. |
| Ouyen | PTV | 37 | 42 | No constraints. |
| Ouyen | MDV | 43 | 43 | No constraints. |
| Ouyen | ABC | 46 | 44 | No constraints. |
| Ouyen | SBS | 51 | 45 | No constraints. |
| Portland | SBS | 68 | 40 | Must restack after digital BALLARAT BCV40, SOUTH EAST SBS40 restack. |
| Portland | ABC | 59 | 41 | Must restack after digital BALLARAT ABC41 restack. |
| Portland | AMV | 65 | 42 | Must restack after digital Coleraine ABC42 restack. |
| Portland | VTV | 56 | 43 | Must restack after digital BALLARAT SBS43 restack. |
| Portland | BCV | 62 | 44 | No constraints. |
| Portland | UA | | 45 | May not commence before digital Warrnambool VTV45 restack. |
| Seymour | SBS | 66 | 40 | Must restack after digital Yea VTV40 restack. |
| Seymour | ABC | 53 | 41 | No constraints. |
| Seymour | AMV | 60 | 42 | Must restack after digital GOULBURN VALLEY GLV42 restack. |
| Seymour | VTV | 57 | 43 | Must restack after digital Yea GLV43 restack. |
| Seymour | GLV | 63 | 44 | No constraints. |
| Seymour | UA | | 45 | May not commence before digital GOULBURN VALLEY AMV45 restack. |
| Tanybryn IBL | SBS | 69 | 46 | Must restack after digital BALLARAT AMV46 restack. |
| Tanybryn IBL | AMV | 67 | 48 | No constraints. |
| Tanybryn IBL | VTV | 64 | 49 | No constraints. |
| Tanybryn IBL | BCV | 66 | 50 | No constraints. |
| Tawonga South | SBS | 28 | 28 | No constraints. |
| Tawonga South | AMV | 34 | 29 | No constraints. |
| Tawonga South | VTV | 40 | 30 | No constraints. |
| Tawonga South | ABC | 31 | 31 | No constraints. |
| Tawonga South | GLV | 45 | 32 | No constraints. |
| Tawonga South | UA | | 33 | No constraints. |
| Terang | SBS | 43 | 34 | No constraints. |
| Terang | ABC | 41 | 35 | No constraints. |
| Terang | AMV | 46 | 36 | No constraints. |
| Terang | VTV | 37 | 37 | No constraints. |
| Terang | BCV | 40 | 38 | No constraints. |
| Terang | UA | | 39 | No constraints. |
| Timboon | SBS | 66 | 28 | No constraints. |
| Timboon | ABC | 63 | 29 | No constraints. |
| Timboon | AMV | 69 | 30 | No constraints. |
| Timboon | VTV | 57 | 31 | No constraints. |
| Timboon | BCV | 60 | 32 | No constraints. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Timboon | UA | | 33 | No constraints. |
| UPPER MURRAY | UA | | 6 | May not commence before digital MURRUMBIDGEE IRRIGATION AREA MTN6 restack. |
| UPPER MURRAY | SBS | 7 | 7 | No constraints. |
| UPPER MURRAY | GLV | 8 | 8 | No constraints. |
| UPPER MURRAY | VTV | 10 | 10 | No constraints. |
| UPPER MURRAY | ABC | 9A | 11 | Must restack after digital MURRUMBIDGEE IRRIGATION AREA ABC11 restack. |
| UPPER MURRAY | AMV | 12 | 12 | No constraints. |
| Walwa/Jingellic | SBS | | 34 | No constraints. |
| Walwa/Jingellic | ABC | 55 | 35 | No constraints. |
| Walwa/Jingellic | AMV | 58 | 36 | No constraints. |
| Walwa/Jingellic | VTV | 61 | 37 | No constraints. |
| Walwa/Jingellic | GLV | 64 | 38 | No constraints. |
| Walwa/Jingellic | UA | | 39 | No constraints. |
| Warracknabeal | SBS | 67 | 28 | No constraints. |
| Warracknabeal | ABC | 61 | 29 | No constraints. |
| Warracknabeal | AMV | 63 | 30 | No constraints. |
| Warracknabeal | VTV | 66 | 31 | No constraints. |
| Warracknabeal | BCV | 64 | 32 | No constraints. |
| Warracknabeal | UA | | 33 | No constraints. |
| Warrnambool | UA | | 46 | May not commence before digital BALLARAT AMV46, Terang AMV46 restack. |
| Warrnambool | SBS | 53 | 47 | No constraints. |
| Warrnambool | BCV | 48 | 48 | No constraints. |
| Warrnambool | VTV | 45 | 49 | No constraints. |
| Warrnambool | ABC | 50 | 50 | No constraints. |
| Warrnambool | AMV | 51 | 51 | No constraints. |
| Warrnambool City | SBS | 68 | 28 | No constraints. |
| Warrnambool City | ABC | 59 | 29 | No constraints. |
| Warrnambool City | AMV | 65 | 30 | No constraints. |
| Warrnambool City | VTV | 56 | 31 | No constraints. |
| Warrnambool City | BCV | 62 | 32 | No constraints. |
| Warrnambool City | UA | | 33 | No constraints. |
| WESTERN VICTORIA | ABC | 6 | 6 | No constraints. |
| WESTERN VICTORIA | SBS | 7 | 7 | No constraints. |
| WESTERN VICTORIA | UA | | 8 | No constraints. |
| WESTERN VICTORIA | VTV | 10 | 10 | No constraints. |
| WESTERN VICTORIA | BCV | 9A | 11 | No constraints. |
| WESTERN VICTORIA | AMV | 12 | 12 | No constraints. |
| Wycheproof | SBS | 69 | 40 | Must restack after digital BALLARAT BCV40 restack. |
| Wycheproof | ABC | 68 | 41 | Must restack after digital BALLARAT ABC41 restack. |
| Wycheproof | AMV | 53 | 42 | No constraints. |
| Wycheproof | VTV | 52 | 43 | Must restack after digital BALLARAT SBS43 restack. |
| Wycheproof | BCV | 55 | 44 | No constraints. |
| Wycheproof | UA | | 45 | No constraints. |
| Yea | ABC | 34 | 34 | No constraints. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Yea | AMV | 46 | 35 | No constraints. |
| Yea | VTV | 40 | 36 | No constraints. |
| Yea | SBS | 37 | 37 | No constraints. |
| Yea | GLV | 43 | 38 | No constraints. |
| Yea | UA | | 39 | No constraints. |

**Table A4.2: Services to be restacked within second restack timing window – 28 January – 30 September 2014**

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Alexandra | SBS | 67 | 46 | Must restack after digital Eildon AMV46 restack. |
| Alexandra | ABC | 60 | 47 | No constraints. |
| Alexandra | AMV | 64 | 48 | Must restack after digital BENDIGO ABC48 restack. |
| Alexandra | VTV | 63 | 49 | No constraints. |
| Alexandra | GLV | 61 | 50 | No constraints. |
| Alexandra | UA | | 51 | May not commence before digital BENDIGO BCV51 restack. |
| Apollo Bay | SBS | 69 | 46 | No constraints. |
| Apollo Bay | ABC | 54 | 47 | No constraints. |
| Apollo Bay | AMV | 67 | 48 | No constraints. |
| Apollo Bay | VTV | 64 | 49 | No constraints. |
| Apollo Bay | BCV | 66 | 50 | Must restack after digital NE TASMANIA TVT50 restack. |
| Apollo Bay | UA | | 51 | No constraints. |
| Bairnsdale | SBS | 52 | 34 | No constraints. |
| Bairnsdale | ABC | 56 | 35 | Must restack after analog NE TASMANIA TVT35 switch-off. |
| Bairnsdale | AMV | 59 | 36 | Must restack after digital LATROBE VALLEY VTV36 restack. |
| Bairnsdale | VTV | 62 | 37 | Must restack after digital Orbost ABC37 restack. |
| Bairnsdale | GLV | 65 | 38 | Must restack after digital NE TASMANIA TNT38, Orbost GLV38, Bruthen ABC38 restack. |
| Bairnsdale | UA | | 39 | May not commence before digital LATROBE VALLEY GLV39 restack. |
| BENDIGO | SBS | 28 | 28 | No constraints. |
| BENDIGO | ABC | 48 | 29 | Must restack after digital MELBOURNE SBS29 restack. |
| BENDIGO | VTV | 54 | 30 | No constraints. |
| BENDIGO | AMV | 31 | 31 | No constraints. |
| BENDIGO | UA | | 32 | Blocked by digital MELBOURNE MGV32 service. |
| BENDIGO | BCV | 51 | 33 | No constraints. |
| Broadford | SBS | 67 | 46 | No constraints. |
| Broadford | ABC | 68 | 47 | No constraints. |
| Broadford | AMV | 61 | 48 | Must restack after digital BENDIGO ABC48 restack. |
| Broadford | VTV | 58 | 49 | No constraints. |
| Broadford | BCV | 64 | 50 | No constraints. |
| Broadford | UA | | 51 | May not commence before digital BENDIGO BCV51 restack. |
| Foster | SBS | 59 | 40 | No constraints. |
| Foster | ABC | 56 | 41 | No constraints. |
| Foster | AMV | 62 | 42 | Must restack after digital LATROBE VALLEY ABC42 restack. |
| Foster | VTV | 65 | 43 | No constraints. |
| Foster | GLV | 53 | 44 | No constraints. |
| Foster | UA | | 45 | No constraints. |
| Koondrook/Barham | SBS | 69 | 46 | Must restack after digital BALLARAT AMV46 restack. |
| Koondrook/Barham | ABC | 68 | 47 | No constraints. |
| Koondrook/Barham | AMV | 53 | 48 | Must restack after digital BENDIGO ABC48 restack. |
| Koondrook/Barham | VTV | 52 | 49 | No constraints. |
| Koondrook/Barham | BCV | 55 | 50 | No constraints. |
| Koondrook/Barham | UA | | 51 | May not commence before digital BENDIGO BCV51 |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| | | | | restack. |
| Lakes Entrance | SBS | 58 | 46 | No constraints. |
| Lakes Entrance | ABC | 61 | 47 | No constraints. |
| Lakes Entrance | AMV | 64 | 48 | No constraints. |
| Lakes Entrance | VTV | 67 | 49 | No constraints. |
| Lakes Entrance | GLV | 53 | 50 | Must restack after digital NE TASMANIA TVT50 restack. |
| Lakes Entrance | UA | | 51 | May not commence before digital Nowa Nowa ABC51 restack. |
| LATROBE VALLEY | GLV | 39 | 28 | Must restack after digital Bruthen SBS28 restack and after analog MELBOURNE SBS28 switch-off. |
| LATROBE VALLEY | ABC | 42 | 29 | Must restack after digital MELBOURNE SBS29 restack and after analog NE TASMANIA SBS29 switch-off. |
| LATROBE VALLEY | SBS | 30 | 30 | No constraints. |
| LATROBE VALLEY | UA | | 32 | May not commence before analog NE TASMANIA ABC32 switch-off and blocked by digital MELBOURNE MGV32 service. |
| LATROBE VALLEY | AMV | 33 | 33 | No constraints. |
| Learmonth (VIC) | SBS | 57 | 46 | Must restack after digital BALLARAT AMV46 restack. |
| Learmonth (VIC) | ABC | 56 | 47 | No constraints. |
| Learmonth (VIC) | AMV | 55 | 48 | Must restack after digital BENDIGO ABC48 restack. |
| Learmonth (VIC) | VTV | 53 | 49 | No constraints. |
| Learmonth (VIC) | BCV | 50 | 50 | No constraints. |
| Learmonth (VIC) | UA | | 51 | May not commence before digital BENDIGO BCV51 restack. |
| Mallacoota | SBS | | 46 | No constraints. |
| Mallacoota | ABC | 56 | 47 | No constraints. |
| Mallacoota | AMV | 62 | 48 | No constraints. |
| Mallacoota | VTV | 65 | 49 | No constraints. |
| Mallacoota | GLV | 59 | 50 | No constraints. |
| Mallacoota | UA | | 51 | No constraints. |
| Mansfield | SBS | 67 | 46 | Must restack after digital BALLARAT AMV46 restack. |
| Mansfield | ABC | 60 | 47 | No constraints. |
| Mansfield | AMV | 64 | 48 | Must restack after digital BENDIGO ABC48 restack. |
| Mansfield | VTV | 63 | 49 | No constraints. |
| Mansfield | GLV | 61 | 50 | No constraints. |
| Mansfield | UA | | 51 | May not commence before digital BENDIGO BCV51 restack. |
| MURRAY VALLEY | SBS | 59 | 46 | Must restack after digital BALLARAT AMV46, Ouyen ABC46, Robinvale ABC46 restack. |
| MURRAY VALLEY | ABC | 58 | 47 | Must restack after digital Deniliquin AMV47 restack. |
| MURRAY VALLEY | AMV | 62 | 48 | Must restack after digital BENDIGO ABC48 restack. |
| MURRAY VALLEY | VTV | 60 | 49 | Must restack after digital HORSHAM SBS49 restack. |
| MURRAY VALLEY | BCV | 65 | 50 | Must restack after digital Deniliquin SBS50 restack. |
| MURRAY VALLEY | UA | | 51 | May not commence before digital BENDIGO BCV51, Ouyen SBS51, Robinvale SBS51 restack. |
| Newborough | SBS | 55 | 40 | No constraints. |
| Newborough | ABC | 67 | 41 | No constraints. |
| Newborough | AMV | 58 | 42 | Must restack after digital LATROBE VALLEY ABC42 restack. |
| Newborough | VTV | 61 | 43 | No constraints. |
| Newborough | GLV | 64 | 44 | No constraints. |

| Area served | Call Sign | Current channel | Final channel | Constraint or comment |
|---|---|---|---|---|
| Newborough | UA | | 45 | No constraints. |
| Robinvale | SBS | 51 | 34 | No constraints. |
| Robinvale | ABC | 46 | 35 | Must restack after digital RENMARK/LOXTON RTS35 restack. |
| Robinvale | STV | 41 | 36 | No constraints. |
| Robinvale | PTV | 37 | 37 | No constraints. |
| Robinvale | MDV | 43 | 38 | No constraints. |
| Robinvale | UA | | 39 | May not commence before digital RENMARK/LOXTON ABC39 restack. |
| Trafalgar/Yarragon | SBS | 55 | 40 | No constraints. |
| Trafalgar/Yarragon | ABC | 67 | 41 | No constraints. |
| Trafalgar/Yarragon | AMV | 58 | 42 | Must restack after digital LATROBE VALLEY ABC42 restack. |
| Trafalgar/Yarragon | VTV | 61 | 43 | No constraints. |
| Trafalgar/Yarragon | GLV | 64 | 44 | No constraints. |
| Trafalgar/Yarragon | UA | | 45 | No constraints. |
| Underbool | SBS | 69 | 34 | No constraints. |
| Underbool | ABC | 66 | 35 | Must restack after digital RENMARK/LOXTON RTS35 restack. |
| Underbool | PTV | 57 | 36 | No constraints. |
| Underbool | STV | 60 | 37 | Must restack after digital Ouyen PTV37 restack. |
| Underbool | MDV | 63 | 38 | No constraints. |
| Underbool | UA | | 39 | May not commence before digital RENMARK/LOXTON ABC39 restack. |
| Waubra | SBS | 57 | 46 | Must restack after digital BALLARAT AMV46 restack. |
| Waubra | ABC | 56 | 47 | No constraints. |
| Waubra | AMV | 55 | 48 | Must restack after digital BENDIGO ABC48 restack. |
| Waubra | VTV | 53 | 49 | No constraints. |
| Waubra | BCV | 50 | 50 | No constraints. |
| Waubra | UA | | 51 | May not commence before digital BENDIGO BCV51 restack. |