Draft Variation to Licence Area Plan – Sydney Radio – No.1 of 2013
Explanatory paper

MARCH 2013
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Background

This explanatory paper accompanies the proposed Draft Variation to Licence Area Plan - Sydney Radio - No.1 of 2013.

The broadcast planning functions of the ACMA are set out in Part 3 of the Broadcasting Services Act 1992 (BSA). In performing its planning functions, the BSA requires the ACMA to promote the objects of the BSA, including the economic and efficient use of radiofrequency spectrum, and to have regard to the planning criteria set out in section 23.

The ACMA refers to the General Approach to Analog Planning when it considers the planning of broadcasting services. This document sets out the legislative framework and planning criteria, as well as the general approach to the planning of broadcasting services. It also contains a record of advice and assumptions about matters relevant to the ACMA’s broadcast planning functions and powers.

Under section 26 (Preparation of licence area plans) of the BSA, the ACMA must, by legislative instrument, prepare licence area plans (LAPs) that determine the number and characteristics, including technical specifications, of broadcasting services that are to be available in particular areas of Australia with use of the broadcasting services bands (BSB), and those plans must be consistent with the relevant frequency allotment plan (FAP).

The ACMA may vary LAPs under subsection 26(2) of the BSA and generally considers variations in response to submissions received or on becoming aware of technical issues that need addressing.

The licensees of the existing Campbelltown commercial radio broadcasting service with the callsign 2MAC, and the Penrith high power open narrowcasting radio service with the on-air ID “Cool Country 2KA”, have proposed that the ACMA consider varying the Sydney Radio LAP to improve the performance of their services.

The ACMA has considered the above proposals and formed the preliminary view that proposed amended operations will potentially promote the objects of the BSA, including the economic and efficient use of radiofrequency spectrum, by improving the coverage and reception of those services in their respective markets. It has therefore decided to seek public comment on proposed LAP variations.

The proposed changes are discussed in the preliminary views that follow:

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1 Section 3 of the BSA.
2 The broadcast planning functions of the ACMA were performed by the Australian Broadcasting Authority prior to 1 July 2005.
The ACMA proposes to vary the technical specifications of the Campbelltown commercial radio service 2MAC by changing its polarisation from vertical to mixed.

Campbelltown Radio Pty Ltd (2MAC) has proposed a change in its polarisation from vertical to mixed, to improve the quality of fixed reception within its licence area (Campbelltown RA1).

The 2MAC Campbelltown commercial radio service is planned to operate on 91.3 MHz from a nominal transmitter site at Mt Hercules Road, Razorback, with a maximum ERP of 1 kW omni-directional and with vertical polarization only.

Vertical polarisation was adopted to ensure 2MAC did not interfere with the reception of the analog commercial television services NBN3 Newcastle and WIN3 Wollongong, which previously both operated with horizontal polarisation.

The use of mixed polarisation is generally preferred for FM services as this provides for optimum reception by fixed, portable and mobile receivers. Operating vertical-only polarisation, although it minimises interference to horizontally polarised television services, potentially results in a radio service not providing adequate reception to fixed receivers.

Unlike analog television, digital television does not make use of the VHF Band II spectrum (i.e. television channels 3, 4 and 5) also used by FM radio.

The WIN3 Wollongong analog television service switched off on 5 June 2012 and the NBN3 Newcastle analog television service switched off on 27 November 2012. As there is no longer any need to protect the analog television services WIN3 Wollongong and NBN3 Newcastle, the ACMA proposes that 2MAC be allowed to adopt mixed polarisation to facilitate improved reception to fixed receivers within its licence area.
The ACMA proposes to vary the technical specifications of the Penrith open narrowcasting radio service on AM frequency 1476 kHz by changing its frequency and output radiation pattern. It is proposed that this service operate on:

> 1386 kHz from Broadcast Site Lot 12 cnr Elizabeth Drive & Luddenham Rd, Luddenham, with a maximum CMF of 300 V DA.

The ACMA proposes to vary the technical specifications of the Sydney community radio service with the service licence number SL1150757 by changing its frequency and output radiation pattern. It is proposed that this service now operates on:

> 783 kHz from Broadcast Site Salt Marsh, Homebush Bay, with a maximum CMF of 690 V OD.

Futrends Pty Ltd (Futrends), the licensee of the high power open narrowcasting (HPON) service at Penrith in western Sydney, has requested a change to its technical specifications to improve the reception of its service within its coverage area. This service currently operates on AM frequency 1476 kHz and transmits at a maximum transmitter power of 276 W (230 V), with a directional antenna.

Futrends has requested a FM frequency (91.7 MHz) or a change in AM frequency, power and antenna radiation pattern, to transmit on 783 kHz at a maximum transmitter power of 500 W using an omni-directional antenna.

The ACMA’s general policy is that HPON services, which are purchased at public auction, should not be substantively changed to improve their value without withdrawing the licence and offering it again at public auction, thereby allowing other parties to bid for the new service. However, as with any administrative policy providing general guidance on an issue, the ACMA must consider whether exceptional circumstances exist that might warrant a departure from the policy.

Futrends considers that it is unable to service its coverage area adequately with its current specifications, primarily at night. It argues that it suffers harmful co-channel interference from Queensland broadcaster 4ZR Roma, which uses the same frequency, and that the ACMA has a responsibility to improve the service and remove the deficiency.

**Background**

The Australian Broadcasting Authority (ABA) planned the 1476 kHz AM Penrith HPON service in 2002. The Sydney LAP specified a nominal transmitter site at Emu Plains, approximately 5 km NW of Penrith. As originally planned, the HPON service was to transmit at a transmitter power of 500 W (225 V) with an omni-directional antenna. It was primarily planned to serve the urban centre of Penrith, along with the surrounding suburban area to a 15km radius from the Emu Plains site during both day and night.

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3 Night-time coverage of AM services can be substantially different – usually reduced – from daytime coverage, as a result of night-time propagation characteristics that can result in significant interference from distant broadcasters.

4 Roma is approximately 800 km north of Penrith.
Penrith Open Narrowcasting Licence Partnership (PONLP) purchased the licence at auction from the ABA in 2002 for $54,000. However, after purchase, PONLP submitted that it was unable to secure a long-term lease at the Emu Plains site. PONLP therefore requested the service be relocated to the Luddenham site, approximately 13 km from the nominal LAP site.

As the Luddenham site was at the southern edge of the original coverage area, simple transposition of the existing technical specification to Luddenham would have resulted in quite a different coverage area from the service as originally planned and auctioned. In order to tailor the coverage as far as possible to the Penrith area for which the service had been planned, and also to minimise overspill, the ACMA proposed a new technical specification with a directional antenna. The coverage area was also redefined to a 20 km radius, based on the predicted day time coverage (2.5 mV/m) from the new site.

In July 2004, after considerable consultation, the ABA varied the Sydney LAP to formalise the change of site to Luddenham.

Before turning to consider the effect on potential coverage of this move, it is important to understand the concepts of ‘urban’, ‘suburban’ and ‘rural’ levels of signal strength. For AM broadcast planning purposes, it is assumed that cities of more than 10,000 people are ‘urban’ environments and that towns from 2,000 to 10,000 people are ‘suburban’. Areas not classified as urban or suburban are “rural”. Urban environments require greater signal strength to overcome man-made noise (interference) than suburban environments, which in turn require greater signal strength than rural environments.

Due to population distribution the coverage radius of the Penrith HPON includes both urban and suburban environments. The main urban environment is centred on Penrith and the remainder of the coverage area is classed as suburban.

The main effect of the Penrith HPON relocation was to move its transmitter further away from the urban environment of Penrith. In response to Futrends’ claims of deficient coverage at both day and night, the ACMA’s engineers have investigated the effect of that move on day and night reception.

Based on desk-top modelling, the ACMA has found that the effect of the relocation has adversely affected both day and night reception in both the urban and suburban environments of the coverage area. Table 1 demonstrates the impact on population covered.
Table 1

<table>
<thead>
<tr>
<th>Grade</th>
<th>Time</th>
<th>Urban (population covered)</th>
<th>Suburban (population covered)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Original</td>
<td>Daytime</td>
<td>143,700</td>
</tr>
<tr>
<td></td>
<td>1476 kHz @ 225 V OD from Emu Plains</td>
<td>Night-time</td>
<td>131,000</td>
</tr>
<tr>
<td></td>
<td>Varied</td>
<td>Daytime</td>
<td>21,960</td>
</tr>
<tr>
<td></td>
<td>1476 kHz @ 230 V DA from Luddenham</td>
<td>Night-time</td>
<td>5260</td>
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</table>

It is common for the day-time coverage of AM services to exceed night-time coverage, due to sky wave propagation causing co and adjacent channel interference at night. However, the scale of the difference between day and night-time coverage in this case is exceptional.

The net effect of these changes to the Penrith HPON service was to significantly alter the original planned coverage of the service, with only a small fraction of the target Penrith market reliably able to be served at night. (The Penrith local government area contains approximately 200,000 people; the approximate population of the coverage area shown in the relevant LAP for the Penrith ONC is 425,000 people.)

Futrends purchased the licence for the Penrith HPON service from PONLP in 2006.

**Discussion**

The ACMA has considered Futrends’ claims about the HPON service coverage and has found that the service has adequate suburban coverage (2.5mV/m) during the day, but poor coverage at night. Also, the severity of the night-time coverage problems results from changes made to the service at the request of the original licensee, PONLP. On the information before it, the ACMA has found that:

- the discrepancy between day and night-time coverage in the Futrends case is exceptional;
- only a fraction of the Penrith area population has access to quality night-time coverage from the service; and
- the discrepancy (between day and night-time coverage) is likely to be a factor mitigating against widespread use of the service.

The ACMA has wide powers to vary a LAP. When exercising its powers, it is charged with promoting the objects of the BSA, including the economic and efficient use of radiofrequency spectrum. It is also required to have regard to the open-ended list of relevant considerations in section 23 of the BSA. The technical adequacy of an existing LAP specification to deliver a broadcasting service within its planned coverage area is a relevant consideration.

Consideration of the matters in section 23 suggests that the ACMA should be open to changing an existing technical specification so as to address coverage problems with an existing service. However, the ACMA will also have regard to its general policy that HPON services, which are purchased at public auction, should not be substantively changed to improve their value without withdrawing the licence and offering it again at public auction. This requires consideration of how any change to the technical

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5 Population covered by a suburban grade of signal means that the received signal level is equal or above a suburban grade (2.5 mV/m). That means population covered by an urban grade (10 mV/m) of service is also included within the suburban grade of coverage.
specifications of the service would compare to the technical specifications of the Penrith HPON service as they existed prior to the auction, as well as the technical specifications as they exist today.

The licensee has requested an FM frequency (91.7 MHz) or a change in AM frequency, power and antenna radiation pattern, to transmit on 783 kHz at a maximum transmitter power of 500 W using an omni-directional antenna.

The ACMA has not confined itself to these options, but has considered a wide range of possible technical solutions.

At the outset, the ACMA considered whether there are any simpler measures to address the problem that would not improve the value of the service as it existed prior to auction.

Moving the Penrith HPON transmitter back to its former nominal location (Emu Plains) would mitigate the night-time reception issue by ensuring that the Penrith population received much higher signal strengths. However, the ACMA understand Futrends has explored this option and has been unable to secure access to the former nominal location.

The ACMA then considered other technical options for addressing the problem, examining their viability and effectiveness, but also the extent of any improvement they would deliver over the value of the licence as it originally went to auction.

> Conversion of the service from AM to FM is not viable as there are no FM frequencies available. (Conversion to FM might also have resulted in a considerable increase in the value of the service.) Accordingly, the ACMA rejects Futrend’s request for a move to 91.7MHz.

> Addressing the problem by changing the technical characteristics of the service on the present frequency at the present nominal site is also not viable. In short, any measure to strengthen the night-time coverage of the service would simply result in increased interference to the co-channelled 4ZR Roma service.

> Conversion of the service to an alternative AM frequency, on the other hand, would be viable. A change of frequency potentially resolves the night-time coverage issues because it eliminates the major source of interference, being the conflict with 4ZR Roma operating on the same frequency.

**The option of using an alternative AM frequency**

There are two other AM frequencies potentially available in the Penrith area, 783 kHz and 1386 kHz, which could potentially help to solve Futrends’ night-time coverage issues.

783 kHz was previously occupied by the 2KA Katoomba AM commercial radio service at 2 kW, before its conversion to an FM frequency 96.1 MHz in 1992. In 1999, the frequency was made available for the Lithgow AM commercial radio service 2LT at 2 kW at Katoomba, to operate as an additional transmitter. The additional transmitter was never used due to the licensee being unable to obtain relevant permission from local government or site owners. In 2008, after consulting publicly on a variation to the relevant LAP, the ACMA approved a change for 2LT Katoomba to an FM frequency. 783 kHz has not been planned for any other purpose since then.

The AM frequency 1386 kHz was originally planned to be made available as one of three additional HPON services in Sydney (1386 kHz at 5 kW DA from Homebush, 1476 kHz at 500 W from Penrith and 1539 kHz at 1 kW from Concord West). In 2002, however, the ABA varied the Sydney LAP to change the category of service of 1386 kHz from open narrowcasting to community broadcasting, and reduced its maximum power to 3 kW OD to minimise the likelihood of interference to 2LG Lithgow.
**Futrend’s request to transmit on 783 kHz at a maximum transmitter power of 500 W using an omni-directional antenna**

Futrend’s proposed AM solution (change of frequency and adoption of an omni-directional radiation pattern) could potentially resolve the interference from 4ZR Roma. However, the adoption of an omni-directional radiation pattern as proposed would result in excessive and avoidable signal overspill both day and night.

This would greatly increase the coverage of the Penrith HPON service, potentially changing it from a Penrith targeted service to a greater Sydney service. Having regard to the general policy of not changing HPON technical specifications so as to improve their value post-auction, the ACMA considered whether there were other options available that might address the night-time coverage issue without otherwise unduly increasing the scope of the service.

The ACMA examined use of either the 783 kHz or 1386 kHz frequencies with a lower power and a directional antenna, designed as far as practicable to confine reception of the service to Penrith listeners.

While the use of 783 kHz for the Penrith HPON service would be administratively simpler (because it has not been planned for allocation), its use in Penrith is not supported. It would be very costly for the licensee to implement, due to the requirement to build a higher and more complex antenna structure than exists at present.

1386 kHz is much closer in frequency to the Penrith HPON service’s current channel (1476 kHz). This makes it more likely that existing transmission infrastructure (particularly the antenna) could be re-used, resulting in a more cost-effective solution than simple adoption of 783 kHz. The 1386 kHz frequency in the community radio broadcasting LAP specification could be substituted with the unused 786 kHz frequency, which is able to offer similar technical coverage to 1386 kHz.

It is estimated that adoption of 1386 kHz would increase coverage of the HPON service for both day-time and night-time. **Map 1** highlights the coverage achieved by the adoption of 1386 kHz. **Table 2** shows the improvement in comparison to the existing Penrith HPON population coverage and original LAP specification.
Map 1

Pink = coverage radius, blue = daytime coverage, red = night-time coverage.

Table 2

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<thead>
<tr>
<th>Option</th>
<th>Time</th>
<th>Grade</th>
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<tbody>
<tr>
<td></td>
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<td>5260</td>
</tr>
<tr>
<td>Proposed</td>
<td>Daytime</td>
<td>100,220</td>
</tr>
<tr>
<td>1386 kHz @ 300 V DA from Luddenham</td>
<td>Night-time</td>
<td>100,220</td>
</tr>
</tbody>
</table>

The adoption of 783 kHz for the unallocated community radio service would not change the planned performance of that service and would ensure that the planned diversity in the Sydney market was not reduced.
Conclusion
The change of frequencies to 1386 kHz @ 300 V DA from Luddenham would appear to promote the objects of the Act, including the economic and efficient use of spectrum, by improving the range of services are available to most Penrith listeners. It could also be implemented without restricting future AM community radio options in Sydney, if the technical specification of the planned, unallocated community broadcasting service is changed to the 783 kHz frequency.

As shown by Table 2, adoption of this technical specification would reverse the loss of coverage, particularly at night, resulting from the post-auction relocation of the nominal site from Emu Plains to Luddenham. However, it would also have the potential to increase the value of the HPON service when compared with the technical specification that was originally offered at auction. In particular, it would offer improved night-time coverage compared to the original technical specification. Accordingly, the ACMA has considered whether it should refuse to vary the technical specifications on the basis of the ACMA’s general policy disposition that it will not substantively change the technical specifications of a HPON service post-auction.

The ACMA’s preliminary position is that there are exceptional circumstances sufficient to warrant a departure from the general policy. These include:
> the exceptionally large discrepancy between day and night-time coverage;
> the fact that only a fraction of the Penrith area population has access to quality night-time coverage from the service; and
> the likelihood that the discrepancy (between day and night-time coverage) mitigates against widespread use of the service.

This preliminary position also takes account of the absence of any more ‘tailored’ options, such allowing the Penrith service simply to broadcast from the former Emu Plains nominal site on its original technical specification. The proposed changes to the technical specifications would see the coverage of the HPON service revert as closely as practicable to the original LAP planned service. Accordingly, the ACMA invites public comment on the option of:
1/ changing the frequency (1476 kHz to 1386 kHz) and modifying the radiation pattern by changing the cymomotive force values of the Penrith HPON radio service currently operating on 1476 kHz; and
2/ in order to accommodate the frequency change for the Penrith HPON, change the frequency to 783 kHz of the planned but unallocated Sydney community radio broadcasting service on 1386 kHz.
The ACMA proposes that the existing radio licence areas in the Sydney LAP be redefined using 2006 census data but otherwise remain unchanged.

The licence areas for radio broadcasting services in the Sydney LAP are currently described using boundaries from the 1996 census.

The Australian Bureau of Statistics has made available to the ACMA the most recently published census count (2006) as prepared by the Australian Statistician. Therefore, the ACMA proposes that these licence areas be redefined using 2006 census data, but otherwise remain unchanged.

The 2011 census count has yet to be made available to the ACMA.

These updated licence areas are detailed in the Licence Area Maps that accompany this explanatory paper.
Submissions

Submissions, quoting file reference ACMA2012/673, are invited in writing by 5 pm, Friday 26 April 2013.

The preferred method for the receipt of submissions is by email to: rps@acma.gov.au, otherwise submissions can be posted to:

Draft variation to Sydney Radio LAP – No.1 of 2013
Radio Planning Section
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616

Any enquiries concerning matters raised in this document should be directed to Christopher Roberts on (02) 6219 5157.

Publication of submissions
All submissions received will be made available for public inspection on the ACMA’s web site at http://www.acma.gov.au.

Under subsection 27(2) of the Broadcasting Services Act 1992 (BSA), the ACMA is required to make all submissions available for public inspection. Any submission marked ‘In confidence’, ‘Confidential’ or similar, will not be considered by the ACMA in finalising this LAP variation.

Effective consultation
The ACMA is working to enhance the effectiveness of its stakeholder consultation processes, which are an important source of evidence for its regulatory development activities. To assist stakeholders in formulating submissions to its formal written consultation processes, it has developed Effective consultation: A guide to making a submission. This guide provides information about the ACMA’s formal written public consultation processes and practical guidance on how to make a submission.