



**Draft spectrum re-allocation
recommendation for the 850/900 MHz band
Consultation paper**

July 2020

Response by Pivotel

The Manager

Major Spectrum Allocations Section

Australian Communications and Media Authority

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1. Pivotel's General Comments

Pivotel is pleased to provide a response to The Australian Communications and Media Authority (ACMA) consultation paper regarding the Draft spectrum re-allocation recommendation for the 850/900 MHz band.

Much of Pivotel's business is underpinned by its access to spectrum, that in turn allows the company to provide tailored voice, messaging and data solutions to regional, rural and remote communities in Australia. This is achieved through our strategic satellite holdings, and LTE (4G) mobile networks, and as a reseller of other wireless-based communication services.

Access to communication services is fundamental to the economic, social wellbeing and growth in this digitally enabled world. In part due to Australia's geography, spectrum is an increasingly used and yet finite resource that must be allocated to support multiple services. The ACMA necessarily must play a pivotal role in providing effective and efficient access to spectrum, enabling the provision of communication services for all Australians. At the heart of this is the principle of allocating spectrum to the highest value use (HVU). The determination of the HVU for a range of spectrum appears to be a valid methodology but would appear to miss regional variations if applied in a blanket manner across the whole of Australia. As a result of Pivotel's specific focus on Regional, Rural and Remote (RRR) Australia we have seen first-hand that access to spectrum necessary to support these communities can be negatively impacted by decisions taken in support of the far more populous urban areas.

For this reason, Pivotel fundamentally disagrees with the recommendation to issue Australia wide spectrum licences (excluding the mid-west Radio Quiet Zone (RQZ)) and believes more optimal outcomes can be achieved by allocating 850/900MHz spectrum in a more dynamic manner in regional areas via specific location Apparatus Licence or Area Wide Licence (AWL) approaches.

Pivotel's proposal would see spectrum licences only in areas where there is existing mobile coverage, that is where incumbent operators have generated value from their spectrum holdings and have effectively ceased extending their coverage without some form of government subsidies. Areas outside of these spectrum licences therefore would be open to existing incumbents and other smaller providers to deliver more targeted and innovative approaches, which are required to service these broad low population density areas and more unique locations.

2. Pivotel's Detailed Comments

Pivotel does not concur with the ACMA's view that *"a single Australia-wide lot excluding the mid-west RQZ would be the most appropriate configuration for the 850/900 MHz band allocation"*. On the contrary, we believe that such a decision would result in a once-in-a-decade opportunity being missed for the following reasons:

A. The proposed determination does not meet a number of the principles that guide the ACMA's allocation of spectrum:

Pivotel notes the requirement for the ACMA to *"manage spectrum efficiently and effectively for the benefit of all Australians"*. The draft recommendation as set out in the consultation paper is supposed to be *"informed by and ... consistent with the object of the Act"*. Further to this, the ACMA spectrum management functions as set out in the ACMA Act, are to provide management of the radiofrequency spectrum in order to:

- *"maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum"*
- *make adequate provision of the spectrum for use by agencies involved in the defence or national security of Australia, law enforcement or the provision of emergency services; and for use by other public or community services*
- *provide a responsive and flexible approach to meeting the needs of users of the spectrum*
- *encourage the use of efficient radiocommunication technologies so that a wide range of services of an adequate quality can be provided*
- *support the communications policy objectives of the Commonwealth Government."*

Pivotel contends that the ACMA draft recommendation is not consistent with the ACMA's obligations under the ACMA Act.

The first objective states that the ACMA is under an obligation to *"maximise...the overall public benefit derived from using the radiofrequency spectrum"*. The current practice of issuing low band (sub 1 GHz) spectrum licences on a national basis has delivered mobile broadband coverage to approximately one third of Australia's land mass. This is despite substantial Federal and State Government programs such as the Mobile Black Spot Program (MBSP) which provides substantial subsidies contributing up to 50% of base station costs. The Federal MBSP has committed \$380m over six rounds with over \$836m of investment in mobile infrastructure already committed over the first 5 rounds for RRR areas including co-contributions from industry, state governments and other third parties. Despite this very substantial contribution, the current practice of issuing mobile specific sub 1GHz spectrum (i.e. 700MHz, 850MHz and 900MHz) on a national basis has resulted in scarce and valuable spectrum being underutilised and in some cases unused in approximately two thirds of Australia's landmass, with little means of access for providers other than the large incumbents. Whilst it can be argued that through the greater propagation characteristics of narrow band technologies, like NB-IOT and LTE-M, this range extends further than a third of the landmass, it needs to be recognised that narrow band technologies do not serve the general public and need far

less spectrum due to the amount of data transmitted. This variant of coverage can still be achieved for IOT / M2M purposes without having to licence all the suitable sub 1GHz spectrum nationally.

In addition to this, the current approach has encouraged incumbent mobile operators to build out their own networks with little regard to network sharing, which can take the form of infrastructure, radio equipment and spectrum sharing, none of which have been widely implemented apart from some limited examples of infrastructure sharing. The public have therefore been left with little choice other than to choose the provider with the optimal coverage for their situation. This has left regional and remote users in vast areas of the country with very limited choice due to the lack of viable alternatives. The lack of access to suitable spectrum is deterring investment and innovation in the development of suitable alternatives to the existing large incumbent(s) to the detriment of public users.

Government policy continues to seek to address this gap through further funding programs like the Regional Connectivity Program (RCP), and the revised MBSP 5A, however the ability for alternative providers to provide innovative, tailored connectivity solutions is hampered by the fact they do not have access to suitable spectrum. Whilst network operators like Pivotal can often, but not always access Apparatus licences, these are typically limited to the 1.8 GHz or 2 GHz bands with their poorer propagation characteristics, resulting in a more costly and sub-optimal outcome compared to operators with access to low band spectrum.

High band spectrum results in an increased number of sites, additional equipment and civil build costs, to obtain similar coverage outcomes. Pivotal, and others, could deliver the same outcomes more cost effectively if they were able to access spectrum in the sub 1GHz range such as the 850 / 900 MHz that is the subject of this consultation paper. Under the current MBSP guidelines, Pivotal and others, are in fact penalised and disadvantaged, due to the need to build additional sites and incur higher costs, which negatively impacts the cost over coverage formula, relative to what could be achieved through access to low band spectrum.

Whilst Pivotal does have a commercial agreement with VHA for spectrum sharing, in practice this has been relatively underutilised, mainly due to the lack of a common incentive for both parties to reach a timely agreement on a solution that meets boundary demarcation objectives. In contrast to other jurisdictions such as continental Europe, where there are multiple national boundaries and where interference matters must be well managed and controlled, there is no obligation on the spectrum owner to accommodate a proposal involving a shared spectrum boundary and unfortunately results in less opportunities to leverage this arrangement.

Thus the current national licencing approach effectively 'locks out' other providers from building new and innovative solutions and does not deliver on the requirement to "*maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum*".

The third objective requires the ACMA to "provide a responsive and flexible approach to meeting the needs of users of the spectrum". Pivotal is of the view that the draft recommendation of issuing spectrum on an Australia-wide basis cannot be deemed responsive and flexible. 850/900 MHz

spectrum is a valuable and scarce resource that can be used to accommodate the latest technologies and developments whereby specialist, niche providers like Pivotel, can cost effectively deliver unique and tailored solutions far more effectively if they have access to fit for purpose spectrum, particularly in underserved regions.

The current national approach to low band spectrum allocation has traditionally benefited incumbent providers through access to government grants and funding as they are the only providers with the spectrum required to build mobile networks in regional areas with optimal propagation characteristics. The lack of competition and innovation in addressing regional and remote coverage is demonstrated by the fact that the incumbents have chosen not to build networks beyond chosen profitable, or profit-supporting, areas unless they attract a government subsidy. These are predominately metropolitan, key regional, tourist, and other high traffic areas. This has left us with an obscure outcome whereby the incumbent operators have exclusive access to spectrum that is not being used, and whereby governments are forced to contribute substantial sums of money to encourage further build out of networks, most often to further enhance the coverage of the largest incumbent and effectively reducing, or removing all together, choice for users in regional and remote areas.

The lack of a “*responsive and flexible approach*” stifles competition and investment from smaller more innovative companies with leaner, newer, technologies and approaches that have emerged in recent years. This further cements the digital divide for regional and remote communities due to the lack of suitable broadband access and impacting the ability to deliver first-world health, safety, education, productivity, and efficiency benefits that most Australians, who live in ‘economically viable areas’ take for granted.

The fourth objective states the ACMA should “*encourage the use of efficient radiocommunication technologies so that a wide range of services of an adequate quality can be provided*”. As has already been contended above, the current practice of issuing national spectrum licences to incumbents, who have very little incentive to continue building out networks in regional and remote areas, has resulted in sub optimal outcomes, despite substantial subsidies. Whether to the benefit of these carriers or not, the practice has stifled the use of the alternative technologies that could be exploited for the benefit of the end user. Users in these areas suffer from access to networks of ‘adequate quality’ and a lack of a ‘wide range of services’ which can be attributed, in large part, to the legacy policy and approach.

With advancements in radio access technologies, and more efficient, cost effective ways of delivering bespoke solutions, it is imperative that the manner in which spectrum is allocated reflects this evolution, and enables new and innovative approaches to delivering connectivity solutions for areas that are currently underserved.

Principles for spectrum management

The draft recommendation also promotes the principles for spectrum management, including:

- principle 1—allocate spectrum to the highest value use or uses
- principle 2—enable and encourage spectrum to move to its highest value use or uses
- principle 3—use the least cost and least restrictive approach to achieving policy objectives
- principle 4—to the extent possible, promote both certainty and flexibility
- principle 5—balance the cost of interference and the benefits of greater spectrum utilisation.

Pivotel's view is that the ACMA draft recommendation to issue spectrum licences on a national basis does not meet a number of the above principles for spectrum management.

To allocate spectrum to the highest value use or uses, according to principle 1, is a somewhat subjective measure and is dependent through which lens this is viewed. The historical practice of issuing sub 1GHz on a national basis has served metropolitan, large towns and high usage areas well, as they have been adequately covered with relatively good quality mobile networks. Outside of these areas however it can be argued that users in RRR areas have not benefited from the social, economic and societal benefits afforded to those in areas where the majority of the population resides. Furthermore, this historical approach, has had a detrimental impact on RRR users, as incumbent operators have held spectrum in these areas which has not been used, preventing other operators from providing services in a more niche and targeted manner. For these users the historical approach has not delivered services to the highest value use or uses and therefore does not meet principle 1 or principle 2.

With respect to principle 3, the issuance of spectrum licences on a national basis is certainly less costly, as its relatively simple to implement and manage. It does however come at a cost to users in RRR areas as described above. Whilst Pivotel's proposal does add some complexity it provides a more balanced approach in serving all areas of Australia, not just those living in higher density areas at the expense of those living in the other two thirds of Australia's landmass. As explained later in this response there are other jurisdictions that have managed this additional complexity for many years and certainly should not be a barrier to ensuring spectrum is used to the benefit of all Australians. The historical practice of issuing national licences can also in one sense be seen as least restrictive, however once again, this is not the case for providers seeking to service under-served segments of Australia due to the lack of access to low band spectrum, restricting their ability to provide connectivity solutions in a more effective and innovative manner.

Certainty can be provided with clarity of strategy and outcomes regardless of the method of spectrum allocation; however, it can be hard to argue that the draft proposal meets the principle of flexibility as principle 4 promotes. In fact, the draft recommendation is inflexible, as it does not deliver on the need to take a flexible approach according to the relevant segments of the market which need to be served across all of Australia.

Lastly, principle 5 promotes balancing the cost of interference and the benefits of greater spectrum utilisation. The draft recommendation does not fulfil the principle of delivering benefits of greater spectrum utilisation due to the lack of spectrum utilisation in the two thirds of the Australian landmass that is currently not served with mobile voice or broadband data. As stated previously Pivotel's proposal does introduce the need for further interference management to manage the different area boundaries, however this is not insurmountable as discussed in more detail later in this submission.

Government communications policy objectives

The Minister for Communications recently issued the below policy objectives for the allocation of the 850/900 MHz band:

- supporting the deployment of 5G technologies
- promoting competitive market outcomes for the long-term benefit of consumers
- encouraging investment in infrastructure, including in regional Australia
- supporting continuity of services
- supporting a national PSMB capability.

Pivotel would like to comment specifically on the third policy objective which states the allocation of 850/900MHz spectrum must encourage "investment in infrastructure, including in regional Australia". There is no reason to believe that the draft recommendation of issuing spectrum licences on a national basis will deliver on this policy objective, particularly with regards to regional Australia. To the contrary, and as discussed throughout this submission, there appears to be very little appetite for incumbent operators to invest further in regional areas, even where substantial government subsidies are made available, resulting in scarce and valuable spectrum lying fallow and unable to be used. The most recent MBSP Round 5 was substantially undersubscribed and is evidence of this anomaly.

In order to achieve this policy outcome it is therefore imperative to make the 850 / 900 MHz spectrum available for RRR use in a manner such as that proposed by Pivotel, to providers other than the existing incumbent mobile operators, as a means of facilitating new innovative approaches. This will promote "competitive market outcomes for the long-term benefit of consumers" for all Australians including those living in RRR areas.

B. Specific Areas of Concern

Geographic Areas

Pivotel concurs with the ACMA view that *“The propagation characteristics of the 850/900 MHz band make it suitable for provision of wide area mobile broadband services”* although the inference that this is why the 900 MHz band was allocated nationwide in 1993 seems unlikely, as it was there was no possibility for small operators to implement local networks at that time.

However, the statement *“A geographic area to be proposed for re allocation should not impede a roll out of Australia-wide services, particularly given the government’s communications policy objective of encouraging investment in infrastructure, including in regional Australia”* would appear to be at odds with the ACMA’s preference to issue nationwide spectrum licences that would, with almost complete certainty, reside with the incumbent operators that, as discussed previously, even after 27 years only cover just one-third of Australia’s land mass with user accessible services. However, due to their ubiquitous spectrum ownership, the incumbent licence holders prevent other operators from economically providing services to remote communities that they have chosen not to service.

It is important to recognise that providers such as Pivotel are effectively ‘locked out’ of access to RRR-suitable sub 1GHz (i.e. 700MHz, 850MHz and 900 MHz bands) spectrum whether in the form of Apparatus, AWL or Spectrum licences. This situation arises as the spectrum has been allocated nationally, for an extended term, through the spectrum licencing process. Despite these allocations having been held for many years, as previously stated, the spectrum is only used in around one third of Australia’s landmass.

This results in spectrum bands that are highly suitable for RRR purposes lying fallow and unable to be accessed by alternative providers. As a result, these providers are forced to acquire apparatus licences in sub-optimal frequency bands such as 2 GHz which has inferior propagation characteristics to spectrum in the sub 1GHz bands, with consequential additional infrastructure build costs.

The use of spectrum

The incumbent carriers’ existing low band holdings have blocked the deployment of cost-effective solutions: The incumbent carriers have had exclusive, nationwide, access to low band spectrum for over 27 years. Impressively, mobile voice coverage now reaches 99% of the population, but with just one third of the land mass covered. The corollary being that the spectrum in two thirds of the country remains unused, but unavailable to regionally focused, low cost, operators. The time taken to reach this point, and the recently under-subscribed Mobile Black Spot Program (MBSP) Round 5, are indicative that the appetite of the incumbent carriers to further improve their coverage footprints is limited. Pivotel notes the Government’s creation of MBSP Round 5A as a recognition of these realities.

The incumbent carriers’ other low band spectrum will remain allocated nationwide:

Notwithstanding the outcome of the spectrum determinations considered here, the existing carriers will have use of the following bands on a nationwide basis:

- **Telstra:** 2 x 20 MHz @ 700, 2 x 10¹ MHz @ 850
- **Optus:** 2 x 10 MHz @ 700
- **TPG Telecom:** 2 x 15 MHz @ 700, 2 x 5 MHz² @ 850 MHz

The 700 MHz allocations do not expire until 2029 and the 850 MHz allocations expire in 2028. From the above it is noted Optus has the least low-band spectrum available, but even a 2 x 10 MHz allocation is capable of delivering 50 Mbps download speeds using 4G LTE technology, twice that of the Australian Government’s Statutory Infrastructure Provider (SIP) requirements. Pivotel’s view therefore is that it is not necessary to allocate the 850 MHz extension and 900 MHz bands on a nationwide basis as the incumbent carriers already have access to sufficient 700 MHz spectrum for use in regional, rural and remote parts Australia.

The technical limitations regarding ‘dead zones’ are over-stated: It is Pivotel’s view that too much emphasis is being placed on the issue of managing areas where RF energy is present from two (or more) operators using the same frequencies. Potentially, this can create an area where the signals from the unwanted service degrade the performance of the wanted service – termed a ‘dead zone’ by the ACMA. However, the size of the dead zone can be minimised by the use of long-standing radio engineering techniques and by the use of latest generation technologies:

- **Coverage Design:** In many parts of the world, for instance continental Europe, this is an unavoidable consequence of abutting national boundaries and there is no choice but to limit coverage to a given geographic area and prevent ‘spillage’ into the jurisdiction of a neighbouring country. Europe has been successfully operating 900 MHz FDD digital services and managing cross boarder coverage since the early 1990s. Initially this was using 2G GSM technology which in fact is more susceptible to interference than current mobile technologies. The techniques required are a combination of site location, use of directional antennas, and power control, all of which are standard considerations for a radio planning engineer. Pivotel does of course recognise that to date in Australia it has not generally been necessary to work with hard borders between co-frequency operators³, however Pivotel does not see why improved design practices cannot be adopted in the future.
- **Technology Advances:** The progression of mobile digital technologies from 2G > 3G > 4G has notably brought about dramatic improvements to data rates, but also significant improvements in the efficient use of spectrum. Greater tolerance to interference allows for higher frequency re-use and therefore higher network capacity. This trend continues with 5G, where the use of ‘Massive MIMO’ allows signals to be ‘targeted’ to the end user’s device while at the same time interfering signals can be nulled out. An important appreciation here is that interference does not occur ‘in the ether’ but at the receiver input, and that a smart receiver can virtually eliminate ‘dead zones’.

¹ Telstra generally has access to 2 x 15 MHz of 850 MHz spectrum in rural Australia but is limited to 2 x 10 MHz in metro areas.
² Conversely, TPG Telecom has access to 2 x 5 MHz of 850 MHz spectrum in rural Australia but has access to 2 x 10 MHz in metro areas
³ An exception would be the 830-835 MHz paired with 875-880 MHz band where there is a hard border between the Telstra and TPG Telecom (formerly VHA) allocations.

C. Comments on the ACMA Options

Option 1: A single Australia-wide lot

As stated previously, Pivotal does not support this option, partly for the reasons articulated by the ACMA, namely *“Due to the propagation characteristics of the 850/900 MHz band, the cost of building and maintaining mobile networks over large areas may be significantly reduced (for example, by reducing the number of base stations required to service a large area compared to providing a similar service using higher frequency bands)”*, and *“However, prospective licensees seeking to provide services in a particular geographic area would be forced to acquire a lot that also covered unwanted areas. This may mean that those unwanted areas are denied services. There is also a possibility that Australia-wide lots may discourage some potential licensees from participating in the allocation process because their commercial interest relates only to discrete geographic areas”*.

An important consideration is whether the highest value use (HVV) is a geographically independent measure. Pivotal’s position is that it clearly is not; in metro areas where there is a high demand for services the HVV can be clearly identified in monetary terms, based on the fact that an operator can achieve a return on investment even when paying a high price for spectrum in a relatively small geographic area. Conversely, achieving a return on investment in a remote area can be challenging even where the spectrum is secured at no cost, as is the case with certain Class licences. This is also why access to low band spectrum is so important in these areas. In these circumstances, the HVV must be based on other factors such as equity with metro services, health, security, etc. It could be argued that the HVV fails to be driven by RoI operator considerations for any public communications facility that has required a government subsidy, such as the MBSP.

For the above reasons, Pivotal considers that a nationwide allocation 850/900MHz band automatically drives the HVV assessment to that of metro areas only, with the flow on effect of disadvantaging investment in low population density areas.

Option 2: Large geographic areas

As highlighted above, Pivotal believes that the issues associated with ‘dead zones’ have been over-emphasized, can be mitigated against, and will further reduce with the introduction of newer technologies.

Pivotal does not see a particular logic to aligning spectrum boundaries to that of the states and territories; many of these are in themselves somewhat arbitrary and it is likely that most operators will be desirous of operating in multiple locations across Australia.

Pivotal does not consider that the additional complexity of having additional lots in the auction process is a valid reason to keep with Option 1; multiple geographic lots have been simultaneously auctioned many times since 1998.

Option 3: Smaller geographic areas

This option is in many ways similar to that of Option 2. The ACMA's concern that "*This option also increases region-based exposure risk for potential bidders seeking to cover an entire state or all of Australia*" seems misplaced as it appears that the incumbent carriers have already reached the limit of where they are prepared to roll-out their networks without the help of government subsidies. It is not a lack of spectrum that is driving this limit.

This option does potentially open the door for a smaller operator to enter the market, but should this happen, it would again be at the expense of all other providers that might be looking to provide local services in the same area.

Alternative Options

Pivotel notes that there is a presumption in both Options 2 and 3 that all areas should be spectrum licensed due to the reference to "*bidders*" throughout the consultation paper. For the reasons given in our discussion of Option 1, and with respect to determining the HVU, we consider this to be sub-optimal. Pivotel's view is that the ACMA should consider a mechanism whereby areas of high commercial value (metro and key regional areas) are allocated via a spectrum auction process, with the remaining spectrum accessed via an Apparatus or AWL licence mechanisms.

Given the current reluctance of incumbent network operators to further extend their geographic coverage into RRR areas unless there is a substantial government subsidy, we can presume incumbents have reached their natural geographic coverage limit where they are able to generate reasonable economic rates of return. There are still cases where for market parity reasons Optus and VHA/TPG may invest to catch up to Telstra's larger footprint, but it is unlikely that the infrastructure investments would pay for themselves in their own right. To create maximum benefit, it would be important to ensure that the high demand spectrum areas are accurately mapped to minimise the number of 'locked out' areas that sit within a spectrum licensed area. The advantages we see of this approach are:

- Areas where the HVU is driven by a societal need rather than a commercial incentive would gain because all potential operators could participate by seeking an Apparatus or Area-Wide licence as appropriate. This would open the door to the newer and more cost-effective solutions that are now possible, especially when there is no need to integrate with legacy systems.
- The revenues raised through the spectrum auction process would arguably be the same as those raised in a nationwide allocation, since it has already been established that it is the competition for spectrum in the metro areas that determines the final price.
- Further revenues could also be obtained in RRR areas through the Apparatus / AWL process which historically have had very little, if any, value attached to them through the spectrum auction process as a result of the lack of network builds in these areas by incumbent operators.

Pivotal Response to the ACMA preferred views

Licence Type

Licence type for the 850/900 MHz band

The ACMA proposes to recommend that the 850/900 MHz band be re-allocated by issuing spectrum licences (as described in the section 153G notice).

Pivotal's view is that spectrum licences should only be issued for those areas where mobile coverage is already provided. Outside of these areas, Apparatus or Area Wide licences should be provided. This would allow for increased access to spectrum by smaller operators that are keen to provide localised services.

Frequency Boundaries

Frequency boundaries in the 850/900 MHz band

The ACMA proposes to recommend that the Minister declare for re-allocation the following frequency ranges:

- > 809–825 MHz
- > 854–870 MHz
- > 890–915 MHz
- > 935–960 MHz.

Pivotal agrees that these frequency ranges should be declared for the provision of mobile broadband services.

Geographic Areas

Geographic areas for spectrum licensing in the 850/900 MHz band

The ACMA proposes to recommend that the 850/900 MHz band be re-allocated across all of Australia, excluding the mid-west RQZ ('the Australia-wide area') (Error! Reference source not found.).

HCIS identifiers for the Australia-wide area can be found in the section 153G notice.

Please see out detailed comments on Pivotal's position on Geographic Areas

Re-allocation Period

Re-allocation period and deadline

The ACMA proposes to recommend a re-allocation period ending on 30 June 2024 for the 850 MHz expansion band and downshift frequencies, and a re-allocation period ending on 31 December 2023 for the 900 MHz band.

The ACMA proposes to recommend a re-allocation deadline for the 850 MHz expansion band, the downshift frequencies, and the 900 MHz band of 12 months before the end of the re-allocation period that ends first in time (12 months before 31 December 2023), namely, 31 December 2022.

Pivotal notes the logic and constraints that apply to these timelines. As we do not support spectrum licencing for rural and remote areas of Australia, we would encourage the ACMA to consider how a

mix of apparatus and spectrum licencing could result in earlier access to the spectrum in some areas of Australia.

Proposed frequency bandwidth configuration

1. Lot number	2. Frequency range (MHz)	3. Channel size (MHz)	4. Band
1*	809–814	5	850 MHz expansion
	854–859	5	
2*	814–819	5	850 MHz expansion
	859–864	5	
3*	819–824	5	850 MHz expansion
	864–869	5	
4**	824–825	1	Downshift frequencies
	869–870	1	
5**	890–895	5	900 MHz
	935–940	5	
6	895–900	5	900 MHz
	940–945	5	
7	900–905	5	900 MHz
	945–950	5	
8	905–910	5	900 MHz
	950–955	5	
9	910–915	5	900 MHz
	955–960	5	

Table 1: * Should spectrum be set aside for a PSMB network, one of these lots may not be included in the re-allocation process.

Table 2: ** We propose to allocate lots 4 and 5 together. It is expected that the 2 x 1 MHz lot may be used by the licensee of Lot 5 to facilitate the downshift as illustrated previously.

ACMA's preferred view

On balance, the ACMA remains of the view that spectrum across the 850/900 MHz band should be offered in paired 5 MHz lots. The ACMA proposes to allocate Lot 4 (2 x 1 MHz) with Lot 5 to facilitate a future downshift of spectrum licences in the adjacent 850 MHz spectrum-licensed band.

We invite comments from stakeholders on this preliminary view.

Pivotal agrees with this general strategy. The use of Lot Number 2 or 3 for a PSMB network would seem inappropriate as it would prevent the simple aggregation of spectrum holdings for higher bandwidth purposes.

Geographic Lot Configuration

ACMA's preferred view

On balance, the ACMA's preferred view is that a single Australia-wide lot excluding the mid-west RQZ would be the most appropriate configuration for the 850/900 MHz band allocation. The ACMA considers this configuration would allow future users of this spectrum to make best technical and economic use of the 850/900 MHz band.

We welcome submissions from stakeholders on the most appropriate geographic configuration for the spectrum.

Pivotal does not agree with this position, please see our detailed comments in this response.

Licence Term

ACMA's preferred view

On balance, the ACMA's preferred view is that spectrum licences in the 850/900 MHz band should be issued for the current maximum term of 15 years. This is with the exception of a licence for the downshift frequencies, which the ACMA considers should be issued for a term that expires on 17 June 2028 (aligning with the expiry date of the existing spectrum licences in the adjacent 850 MHz band).

The ACMA further considers that it may be appropriate for spectrum licences in the 850 MHz expansion band to commence at the end of the re-allocation period, on 1 July 2024, and for spectrum licences in the 900 MHz band and downshift frequencies to commence as soon as possible after the allocation process is complete.

We welcome stakeholder views on licence terms and commencement dates for 850/900 MHz band spectrum.

Pivotal respects the need to provide certainty of tenure for all spectrum holders. Clearly, this must be balanced against the need to create the opportunity for new technologies and solutions as they become available to gain access to suitable spectrum. As such, we see it to be a key strategic objective of, and challenge to, the ACMA to create a spectrum framework that can meet these, at times, conflicting objectives.

Allocation Methodology

ACMA's preferred view

The ACMA's preferred view is to use the SBCA format, using a pay-your-bid (first-price) rule to allocate the 850/900 MHz band.

We welcome stakeholder views on the most appropriate allocation methodology for the 850/900 MHz band.

Pivotal has no strong view on the auction methodology.

For any questions in relation to this submission please contact:

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About Pivotel

Pivotel operates a mobile and satellite telecommunications network pursuant to a carrier licence issued by the ACMA in accordance with the Telecommunications Act 1997 (Cth) (Telco Act) and operates ground infrastructure in Australia, making it the fourth public mobile carrier in the country. It is the only Australian carrier with direct connection to all four major mobile satellite networks: Iridium, Inmarsat, Thuraya and Globalstar and is also a reseller of the NBN Sky Muster and BSS satellite services

The company's suite of satellite and mobile technologies enable remote connectivity via satellite phones, satellite data modems, personnel and asset trackers, docking kits, machine to machine data terminals and specialist maritime communication devices.

Pivotel's 4G LTE mobile network solution, ecoSphere[®], extends its carrier network to deliver complementary terrestrial wireless services to rural and remote Australians. Using our innovative off-grid ecoCell[™] base station technology and network architecture, ecoSphere[®] can cost effectively delivery wide area mobile broadband and IoT coverage to remote communities, transport corridors, mining, agriculture and pastoral properties using satellite or terrestrial backhaul complemented by satellite point to point IoT and high-speed data services.

Pivotel has over 130 staff and has Australian offices located on the Gold Coast, Sydney, Dubbo and Perth in addition to a number of overseas locations. In regional Australia, Pivotel supports over 160 dealers and 50 value added resellers.