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**Pivotel Response to
Expiring spectrum licences: stage 2
Information gathering, and views on uses of
frequency bands and alternative licence conditions**

5th June 2024

Pivotel welcomes the opportunity to comment on the ACMAs Expiring spectrum licences: Stage 2 Information gathering, and views on uses of frequency bands and alternative licence conditions.

Pivotel is a 'prospective alternative licensee' who does not hold an ESL, and would like to have the opportunity to use parts of the spectrum currently covered by one or more ESLs.

CONTEXTUAL STATEMENT

- Pivotel is an Australian owned and operated company and has been delivering voice services and connectivity solutions to regional and remote Australian customers since 2003.

- 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 full Carrier Network Infrastructure including 4G / LTE networks and a Tier 1 Voice Core Network used to deliver targeted connectivity solutions in regional Australia and is one of only four operating Australian public mobile network operators.

- Pivotel has over 100,000 connected mobile satellite services and is the only Australian carrier offering services of all major mobile satellite networks including Iridium, Inmarsat, Globalstar, nbn™ and Intelsat as well as agreements with LEO Sat providers including OneWeb and Starlink.

- 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 base station technology and network architecture, ecoSphere® can cost-effectively deliver wide area mobile broadband and IoT coverage to remote communities, transport corridors, mining, agriculture and pastoral properties using satellite or terrestrial backhaul complemented by our satellite high-speed data and IoT services.

- Providers such as Pivotel are well placed to play a unique and relevant role in improving coverage and bringing innovation to parts of regional and remote Australia. This is however predicated on access to suitable spectrum at a cost that enables a reasonable return on investment.

- Spectrum in low, mid, and high bands is crucially important for the delivery of 4G/5G/6G services which enable emergency calling, mobile handheld and mobile wireless broadband (WBB), Fixed Wireless Access (FWA) and IoT use cases.

- A flexible spectrum management approach consisting of Spectrum Licences covering large geographic and even national regions combined with Area Wide Licences that enable place based networks will encourage a larger and more diverse range of network operators and innovation.

- Licence fees need careful consideration with place-based networks typically targeting very specific populations, often with very low density and high natural operating costs that reduce the potential for operators to receive a commercial return on investment.

- Pivotel has consistently advocated for a combination of spectrum licencing, complemented by Area Wide Licences (AWLs) in key bands for place-based connectivity solutions in metro and regional and remote parts of Australia, as opposed to a blanket national spectrum licence approach.

- The creation of a competitive, innovative marketplace for the delivery of 5G services in metropolitan areas also requires that AWLs be available in metro areas, alongside wide area spectrum licences.

- As a mobile operator already delivering 4G/5G services to regional and remote parts of Australia, and with plans to deliver 5G place based services to campuses, ports, utilities, and manufacturing facilities in metro areas, Pivotel is pleased to contribute to the ACMA's information gathering exercise regarding expiring spectrum licences.

Pivotel Response

Please see below for answers to the information requested from Pivotel as a prospective alternative licensee.

Where possible we have provided details of potential alternative uses, use cases and users for the spectrum covered by ESLs.

> **Parts of the spectrum and geographic areas of interest:**

  o As mid-band spectrum availability is primarily covered by existing AWL and AL constructs, Pivotel is particularly interested in accessing low-band spectrum (i.e. < 1GHz) in remote and regional areas beyond existing national mobile network operators' coverage perimeters. Low band spectrum is particularly suited to long-range wide area applications and reduces the capital impost to service these areas.

  o It is a well-known fact that very substantial parts of Australia (>60%) remain without connectivity and that low band spectrum is effectively lying fallow in these areas. This unused low-band spectrum could be used by alternative providers seeking to provide connectivity solutions to industry (e.g. mining, agriculture), public safety and remote communities including First Nations communities.

> **Why the spectrum is necessary for that alternative use and whether the potential alternative user has sought alternative spectrum (either through allocation exercises or via secondary market)**

  o The main use case for sub 1GHz spectrum, in addition to mid-band (3.4GHz – 4.0 GHz) and mmWave that has been allocated via AWLs, is to enable the build of defined area public and/or Private 4G and 5G networks.

  o Pivotel's focus is on regional and remote communications to deploy 4G/5G mobile network infrastructure in areas that are not served or under-served by the main three mobile operators. These services are complemented by satellite services that can provide backhaul and voice and data (including IoT) services to virtually any location in Australia.

  o ecoSphere® forms the basis of Pivotel's place based coverage solutions. It is an innovative, custom designed, fully managed, 4G/ 5G solution operating outside of the existing national operators' cellular network footprint. The focus on 4G/5G is driven by the technology's ability to support both low and high bandwidth, as well as Mobile Voice, Data and IoT use cases across many industry verticals including our key focus areas of agriculture, mining, remote communities and public safety.

  o ecoSphere® provides high bandwidth mobile and fixed services which can support applications like video monitoring and streaming, providing the ability to use tablets, augmented reality headsets, support precision farming, and wide range of other useful applications on and around farms, mines and other operational environments. This is in addition to the ability to support 3GPP standardised and native low-bandwidth services to support use cases such as multiple IoT devices gathering management information.

- One key advantage of 4G/5G solutions is that they operate in licensed spectrum bands where the operator has control and protection over interference sources and can therefore manage performance with confidence and with an expectation that it will be maintained over time.

- In order to facilitate 4G/5G deployments cost effectively alternative providers need to access spectrum in the sub 1GHz bands as described above. This provides the ability to operate over a wider geographic area and service larger areas delivering greater social and economic benefit to specific solutions.

- Pivotel operates ecoSphere® at a limited number of sites utilising mid-band spectrum and is planning to increase the number of services over the coming years. Currently Pivotel has 20 LTE base stations in operation with an anticipated additional 50 to 200 base stations by the end of 2026.
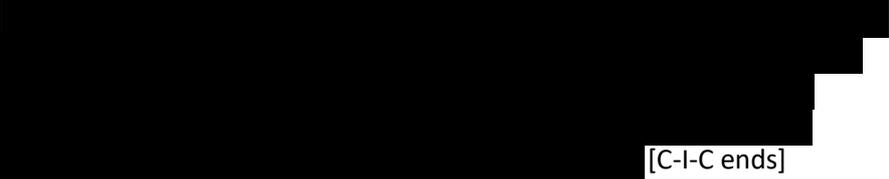
- [C-I-C starts] ███ [C-I-C ends]

> **Desirable bandwidth**

- Low-band mobile coverage in regional and remote areas would require a minimum 10 MHz FDD channel, preferably 20MHz FDD, to provide a balance between coverage and capacity in order to support mixed services. Data speeds of 50/25 Mbps and up to 100/50 Mbps could be provided under good coverage. Voice, emergency calling, and SMS service could be provided at the cell edge, with an approximate 15km range. In many use cases, low-band deployments would be enough from a capacity perspective. In areas with greater populations (larger communities in regional and remote areas), mid-band augmentation to provide capacity would be required.

> **Whether the alternative use is new or would complement an existing use**

- The addition of low band spectrum would complement existing use cases for Pivotel who have been granted access to 3.4 GHz spectrum (typically TDD 60 MHz) in remote Australia on an AWL basis. Pivotel has also made an application for similar spectrum in selected regional areas. MNOs like Pivotel have the alternative of making use of FDD 1.8 GHz and FDD 2.1 GHz apparatus-based licence in remote areas, and 2.1 GHz apparatus-based licence in regional areas where it is not fully subscribed.

- A limit of 10 MHz channel is imposed by ACMA for a single operator in the 1.8 GHz and 2.1 GHz bands. To provide a wide area mobility footprint, usage of this mid-band spectrum requires at least three times the infrastructure compared to low-band spectrum and hence making it unviable for a large proportion of target customers.

> **How the spectrum would be used to complement or enhance existing service for example, add capacity, lower deployment costs, improve coverage**

- Answered above

> **The current extent of service and planned growth**

- Pivotel operates ecoSphere® at a limited number of sites utilising mid-band spectrum and is planning to increase the number of services over the coming years. Currently Pivotel has 20 LTE base stations in operation with an anticipated additional 50 - 200 base stations by the end of 2026.

- Pivotel is currently in the process of acquiring C-Band spectrum via the AWL process which will form the basis of our next wave of ecoSphere® products. These products will be primarily focused at remote communities and enterprise wireless solutions, unlocking latent demand and bridging the digital divide as well as driving increased productivity and operational improvements across industries. It is paramount that to effectively develop and scale public and private wireless network products, a reliable and consistent source of spectrum is made available.

- In order to enable cost effective and optimal coverage outcomes it is essential to enable access to low-band spectrum more broadly. Pivotel views the availability of low-band spectrum in regional and remote areas as key to our growth in these markets. Whilst we can technically service regional and remote markets with a mid-band solution, this provides for a sub-optimal outcome due to its inferior propagation characteristics.

> **Vews on particular allocation methods and interest in taking part in an auction process**

- Traditional approaches to allocating spectrum in Australia have been through auctioning long-term spectrum licences where the spectrum is allocated to the highest bidder with very limited ability for innovative alternative providers to acquire appropriate spectrum to deliver targeted solutions for specific use cases.

- Pivotel has consistently advocated for a combination of spectrum licences for more populous urban areas, complemented by local Area Wide Licences (AWL) to facilitate 'private' networks around ports, manufacturing facilities and industrial parks. Such a mix of spectrum and Area Wide Licences (AWLs) will help facilitate a dynamic, innovative and competitive urban marketplace.

- Pivotel has also advocated for apparatus licensing for regional and remote Australia, as opposed to a blanket national spectrum licence approach. Pivotel's view is that such a dynamic and flexible approach is necessary to recognise the different needs and characteristics of Australia's unique and geographically dispersed population. It is pleasing to see this approach being adopted through AWLs in recent spectrum allocation processes for mid-band and high-band spectrum.

- Pivotel was a participant in the 850-900 MHz auction in December 2021 where it bid substantial sums to attempt to acquire 2 * 10MHz of regional spectrum.

- Unfortunately, due to the structure of the lots being auctioned and the 20-year licencing approach, Pivotel was outbid by the ultimate spectrum holders [C-I-C starts] ███ C-I-C ends]. This spectrum is now licenced for a 20-year term ending in 2044.

- Pivotel's experience during the 850 MHz spectrum licence auction, was that the process left no room for new entrants to secure regional and remote spectrum. Limiting the

ability of smaller more innovative providers to acquire this spectrum limits competition and stifles opportunity for new entrants, thus discouraging deployment of communication infrastructure in regional and remote areas while the spectrum ends up being poorly utilised (i.e., low productive efficiency).

- o Low-band spectrum is essential to deploy cost-effective and fit for purpose solutions in regional and remote Australia but is not available via an Area Wide Licence (AWL) mechanism. For three decades, the national MNOs have held low band spectrum licences, and yet there remain substantial gaps in fulfilling the communication needs of regional and remote Australia.

- o LEO satellite solutions are evolving and will help to close the gap, however, there remains an ongoing requirement for high mobility (indoor-outdoor), high data rate, low latency and reliable communication that satellite services are unable to offer. Furthermore, the long-term sustainability of new and proposed LEO constellation providers is yet to be proven. Therefore, access to low-band spectrum for smaller, innovative, new entrants should be an important consideration under the ESL process.

- o Whilst it is acknowledged that existing spectrum holders and users thereof, have an ongoing requirement to the use of that spectrum, Pivotel's view is this should only apply in areas where the spectrum is being utilised and where the Highest Value Use (HVU) is being applied. Where the spectrum is not being utilised and it is subject to long term licence conditions it should be made available to alternative users under either the 'Use it or Lose it' (UIOLI) or 'Use it or Share it' (UIOSI) principles. Where spectrum is not being utilised and is the subject of an expiring spectrum licence it should be made available under and AWL or AL process.

> **Views on whether shared or exclusive licensing is desirable**

- o The ACMA could consider establishing a framework that supports AWLs for low-band spectrum for new entrants and neutral host requirements. This approach is likely to encourage investment towards reducing designated black spots e.g., national parks, roads and tourist spots having weak or no coverage.

We encourage submissions that detail how proposed use of the relevant spectrum could align with the policy objectives in the draft MPS.

Pivotel is very encouraged by the Ministerial Policy Statement (MPS) on Expiring Spectrum Licences (ESL) being:

- Supporting service continuity for end users, particularly where no alternative service is available

- Opportunities for new entrants and use cases, including for low earth orbit satellites (LEOsats)

- Connectivity and investment in regional areas to deliver improved services to end users

- Promote competition

- Capacity for sustained investment and innovation.

Spectrum is an essential input for a competitive and thriving market. Encouraging competition through access to suitable spectrum will promote innovative products and services creating a conducive environment for Australia to take advantage of the social and economic benefits of a digitally connected society.

Crucial to the renewal of spectrum licences is the public interest test applied by the ACMA which is "designed to ensure that spectrum is used efficiently, by preventing it from being locked up in uses that no longer offer the highest value or the maximum public benefit. It is a tool for us to analyse the potential benefits that renewal of a licence may offer to the long-term public interest, consistent with the object of the Act".[1] Whilst the public interest test is somewhat of a subjective test it is an important overriding test that should be consistently applied to ensure spectrum isn't 'locked up' where it doesn't meet the Highest Value Use (HVU) principle.

This service continuity requirement is acknowledged in the Minister's statements, however, it is pleasing to see the Minister also acknowledge the requirement to support new entrants and use cases, enhancing investment and connectivity to bridge the digital divide in regional Australia, promoting competition and supporting investment and innovation. It is through enabling alternative providers in addition to the three large national incumbent MNOs that a truly diverse, competitive, and innovative environment can be created to support and deliver against these additional statements.

To provide some additional context, Pivotel does support incumbent spectrum licence holders to have first rights to spectrum licences in geographic areas where they have existing (and demonstrated planned) mobile coverage. That is where incumbent operators are generating value from their spectrum holdings and is the border at which they have effectively ceased extending their coverage without some form of government subsidy. Under the expiring spectrum licence policy framework areas outside of these existing coverage areas should be open to existing incumbents and other new providers via AWLs to deliver more targeted and innovative approaches, which are better suited to service these low-population density areas and more unique locations.

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[1] ACMA, **Our approach to radiocommunications licensing and allocation,** Implementing the *Radiocommunications Legislation Amendment (Reform and Modernisation) Act 2020,* MARCH 2021, page 25.

This approach would still meet the objective of protecting incumbent licensees' right to unencumbered spectrum, with the proposed approach being to issue AWLs in parts of the reallocated spectrum.

Secondary market activity

In relation to proposed use cases, have you sought access to spectrum through other means (such as participating in allocation exercises, third-party authorisations or trading) and, if so, were whether these attempts were successful, partially successful or unsuccessful?

As mentioned above [C-I-C starts] ███████████████████████████████████

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Supporting relevant policy objectives and priorities (regional, rural, and remote connectivity, investment and competition)

It has been demonstrated through recent Mobile Black Spot Programs (MBSP) that were under-subscribed, that deployment of mobile infrastructure for existing national MNO's in rural and remote areas beyond existing network boundaries is uneconomic without some form of government co-contribution. This issue is further exacerbated for alternative place-based network providers such as Pivotel, who do not have access to low band spectrum, which is essential to service these areas and provide wide area coverage and penetration.

Low-band spectrum is the only suitable, cost-viable alternative, in outer metro and regional areas where dense vegetation and other forms of signal propagation barriers exist. To enable competition and innovation for public and private use cases, new entrants must be able to access low-band spectrum via an AWL mechanism. In order to encourage competition and innovation, it is imperative that the ESL process provides scope for granting low-band AWL's to enable new and alternative use cases.

Additionally, active network sharing and neutral host programs are becoming increasingly popular and supported via government funding programs. Neutral host services and MOCN solutions are not viable when the neutral host does not have access to suitable spectrum. Enabling access to low-band AWLs is likely to encourage further investment in active sharing and neutral host solutions that will ultimately help improve digital connectivity and reduce black spots.

Resilience and temporary disaster responses

We welcome feedback from stakeholders concerning resilience and temporary disaster responses that arise in the context of spectrum licences and the ESL process.

One good example of how spectrum could be utilised by unique infrastructure, and a carrier like Pivotel in a disaster event, would be through the deployment of licensed spectrum for emergency response Cell on Wheels (COWs) and offering neutral host connectivity to all carriers and critical connectivity for first responders and disaster management teams. This type of infrastructure could be used in the event that local permanent infrastructure went offline, and a rapid response was required to restore communications.

This solution calls for a 'neutral party' to provide an open access, network agnostic service, whereby all MNO's can actively access shared temporary telecommunications facilities i.e. COWs. This approach would see said 'neutral party' effectively provide a one-way roaming solution to Telstra, Optus and TPG Telecom, allowing access to all mobile users irrespective of their existing provider, and is similar to the technical approach adopted in New Zealand through the Rural Connectivity Group.

It is not uncommon for disasters or emergency events to occur in areas of little or no mobile coverage and this approach would allow emergency responders to request (and/or provide) temporary mobile coverage whenever and wherever required, whether or not the existing mobile infrastructure of one or more MNOs has been damaged or rendered inoperable due to disaster.

This service would be provided on a managed service, whereby a pre-determined number COWs would be deployed to nationally distributed locations, where they would be managed and serviced. Emergency deployment could be managed by the relevant emergency services departments and centrally managed.

Under this kind of solution, only one COW would need to be deployed to an impacted area, servicing all emergency response users, in addition to all end users of the national MNO's.

This lower cost approach, without sacrificing quality or reliability, utilising roaming is a far more cost effective and efficient solution than individual MNO's investing and managing their own COWs and could provide an enhanced ability to cover more areas affected by natural disasters through economies of scale and reduction of duplication of costs and resources.

The above scenario is entirely dependent on access to suitable spectrum, and inter-working with national MNO's, who have already indicated that emergency roaming is viable.

Alternative licence conditions

We welcome stakeholder views on whether UIOLI or UIOSI conditions would be effective in achieving more efficient use of the spectrum.

Pivotel supports the use or UIOLI or UIOSI conditions. Pivotel acknowledges and respects the rights of national licence holders to use spectrum in areas where they have existing network infrastructure, or are intending to build infrastructure, however does not support them holding large swathes of

spectrum in areas where they have no intention to build. In these areas, where it can be demonstrated that there is a need for infrastructure and spectrum to be utilised, spectrum must be made available. This is particularly the case for low band spectrum.

An example of this could be for a First Nations Community that has no access to digital connectivity other than via satellite. In this instance, if a provider such as Pivotel has the support of the community and the government, it should be able to access suitable spectrum to deliver mobility and high-speed mobile broadband in the most efficient and cost-effective manner.

Alternative mechanisms to achieve outcomes

Pivotel does not believe rollout obligations are necessary or appropriate in the Australian context. With +/- 99% of the population covered by existing mobile networks mandating rollout obligation requirements is unlikely to encourage further investment.

Attaining further coverage in underserved areas is better served through a targeted policy at funding programs for specific locations (roads, communities, tourist areas etc) with obligations for the access provider to provide active sharing. This can either be provided through a neutral host arrangement or an existing MNO as the host access provider.

In order to enable new providers, and active neutral hosts via MOCN, appropriate low-band spectrum has to be made available to non-national MNO incumbents. In Pivotel's view this is best served via AWLs.

Competition is better served through government policy and incentives that encourage and/or enforce sharing of networks in uneconomic areas via government (co)funded sites.

Pivotel is aware of dynamic spectrum access (DSA) techniques and one example where this is being employed in practice, namely the CBRS use case in the US. The CBRS model uses an automated spectrum access system (SAS), fixed sensor network and databases to dynamically manage access hierarchies. This is a relatively costly and complex approach that may be appropriate in certain instances however, Pivotel's view is Australia would initially at least, be better served through the use of a simpler and more cost-effective approach.

Pivotel prefers the approach taken by Ofcom in the UK concerning 'Access to licensed mobile spectrum' which recently announced 'a new licensing approach to provide localised access to spectrum bands that can support mobile technology'[2].

'Spectrum sharing is a key part of Ofcom's strategy for spectrum management. The Shared Access framework provides a mechanism to access frequencies with established or developing mobile equipment ecosystems, on a localised basis. We have seen growing interest in this form of access

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[2] Ofcom: Supporting increased use of shared spectrum, A consultation on proposals to enhance our Shared Access framework to support a growing variety of spectrum users, https://www.ofcom.org.uk/__data/assets/pdf_file/0017/272051/Consultation-Shared-Access-Licence.pdf

over the last four years, with more than 1,500 licences now issued, and a number of other countries adopting similar approaches.'[3]

Ofcom has previously stated they anticipate this spectrum is only likely to be available to share in remote areas (like the 68% of RRA not covered by existing mobile networks) and will make the licences available for 3 years or more. This approach is on a 'use it or lose it' basis and Ofcom has the ability to issue a local access licence whereby the obligation is on the incumbent provider to raise a 'reasonable objection'.

This approach is simple and cost effective and provides access to spectrum in areas where it is not being utilised allowing regional and remote users to benefit from innovative area specific solutions as envisaged under the various government programs like the RCP. We would recommend a longer licence period than the 3 years suggested by Ofcom with a minimum of 5 years.

Pivotel's view is this is a far simpler approach than a DSA approach however Ofcom also considers it may transition to DSA arrangements at some time in the future.

Pivotel also acknowledges that the current legislative framework prohibits the allocation in the above manner and has discussed this shortcoming with the Department of Communications and the Arts (DoCA) to determine if there are any mechanisms to address this.

In relation to the value of this spectrum Pivotel considers the 'locked up' 68% or more of sub 1 GHz spectrum to have high value in terms of community benefits (especially in agriculture, remote communities and safety), but virtually no economic value, as demonstrated by the lack of use by the incumbents. Given that Australia's largest mobile network claims to reach 32% of the land mass and >99% of the population, with little or no further coverage extension planned (unless co-sponsored by external parties), we can infer that spectrum value is proportionate to population coverage and therefore the value assigned by the incumbent to the remaining spectrum area is minimal.

For any questions concerning this response please contact:

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[3] Ofcom: Supporting increased use of shared spectrum, A consultation on proposals to enhance our Shared Access framework to support a growing variety of spectrum users, , Clause 1.2, https://www.ofcom.org.uk/__data/assets/pdf_file/0017/272051/Consultation-Shared-Access-Licence.pdf