
GENERAL NOTICE

NOTICE 1002 OF 2009



INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

The Independent Communications Authority of South Africa, pursuant to section 31(3) of the Electronic Communications Act, 2005 (Act No. 36 of 2005) hereby publishes the findings on the criteria for awarding radio frequency spectrum in the 2.6GHz and 3.5GHz bands.

A handwritten signature in black ink, appearing to read 'Paris Mashile'. The signature is fluid and cursive, with a large initial 'P'.

**PARIS MASHILE
CHAIRPERSON
ICASA**

NOTICE OF REASONS IN TERMS OF SECTION 4C (6) OF THE INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA ACT, 2000 (ACT NO. 13 OF 2000), PERTAINING TO THE REGULATORY PROCESS INSTIGATED PURSUANT TO SECTION 31(3) OF THE ELECTRONIC COMMUNICATIONS ACT, 2005 (ACT NO. 26 OF 2005)

1. INTRODUCTION

- 1.1. On the 2nd November 2006, the Independent Communications Authority of South Africa ("the Authority"), pursuant to section 31(3) of the Electronic Communications Act, 2005 (Act No. 36 of 2005) ("the Act"), published a discussion document soliciting written comments from interested persons regarding the procedures and criteria for granting a radio frequency spectrum licence for competing applications or instances where there is insufficient spectrum available to accommodate demand. The Discussion Document sought to, amongst others, solicit written responses from interested persons to questions posed by the Authority in relation to the manner in which the residual radio frequency spectrum within the ranges of 2500 – 2960 MHz ("the 2.6 GHz ranges") and 3400 – 3600 MHz ("the 3.5 GHz ranges") ("designated ranges") ought to be assigned. The Authority had determined that there existed an inelastic availability or supply of the radio frequency spectrum relative to the aggregate demand for access to the designated ranges. The exponential increase in the aggregate demand for access to the designated ranges had been influenced by an increase in the demand for the provision of broadband wireless access services. It is common cause that the designated ranges are ideally suited for the provision of these services.

- 1.2. It is also common cause that when seeking to assign the radio frequency spectrum, the Authority has utilised the Command and Control administrative mechanism, which amounts to an administrative process entailing the consideration to assign the radio frequency spectrum to a prospective licensee on a "first-come-first-serve" basis. Having determined that there existed an inelastic availability or supply of the radio frequency spectrum in the designated ranges relative to the aggregate demand, the Authority was of the view that the granting of the radio

frequency spectrum within the designated ranges on a “first-come-first-serve” basis would result in an inequitable and inefficient granting or assigning or rewarding of the radio frequency spectrum. Furthermore, the Authority considered that consistent with its observations of other regulatory authorities and their respective perspectives regarding the granting of radio frequency spectrum for broadband wireless access services, that there exists a significant departure from the traditional Command and Control mechanism for the granting of such radio frequency spectrum due, in part, to a realisation of the intrinsic economic value of such radio frequency spectrum.

2. USAGE OF THE RADIO FREQUENCY SPECTRUM AND OBJECTS OF THE ACT

- 2.1. The radio frequency spectrum possesses an intrinsic economic value due to its nature as a critical input to the provision of electronic communications services and broadcasting services which greatly contribute to the advancement of socio-economic development in the Republic of South Africa.
- 2.2. Furthermore, the utility of the radio frequency spectrum as an essential constituent for the advancement of innovation and dynamic efficiency within the information society as an efficient and cost effective medium of communication has long been recognised. Therefore, there exists a necessity in ensuring that the radio frequency spectrum is managed and used in an optimally efficient manner in which would ensure the maximisation of societal welfare.
- 2.3. The granting of the radio frequency spectrum by the Authority must as far as possible seek to facilitate the attainment of the underlying policy imperatives of the Act, in particular those policy imperatives which are detailed in section 2 of the Act. These policy imperatives ought to be construed with the underlying purpose of ultimately ensuring that the radio frequency spectrum is used in a manner which brings optimal welfare and benefits to the entire Republic of South Africa.

At the forefront of ensuring the effective and efficient utilisation of the radio frequency spectrum is the encouragement of the use of more spectrally efficient technological applications.

3. THE DISCUSSION DOCUMENT

- 3.1. In General Notice No. 1540 of Government Gazette No. 29351, the Authority posed seven (7) questions and a general invitation to interested persons to submit their respective views relating to the designated ranges. The Discussion Document was subdivided into two sections, namely sections A and B. Section A related to the discussion of the prevailing regulatory environment regarding the occupancy levels in the 3.5 GHz frequency ranges, while Section B related to similar questions pertaining to the 2.6 GHz frequency ranges.
- 3.2. The questions in both sections A and B were posed in the following manner:

Question A 1 and B 1

How should the remaining spectrum be subdivided?

Questions A 2 and B 2

Should the Authority consider National or Regional allocation of (geographically restricted) licences or a combination of both?

Questions A 3 and B 3

How many licenses ought to be issued within the available spectrum?

Questions A 4 and B 4

Which method or criteria should the Authority use in considering applications for the awarding of radio frequency spectrum licenses for competing applications?

Questions A 5 and B 5

Which method or criteria should the Authority use in considering applications for the awarding of radio frequency spectrum

licenses where there is insufficient spectrum available to accommodate demand?

Questions A 6 and B 6

Which other policy imperatives ought to guide the Authority in determining the procedures and criteria contemplated in section 31(3) of the Act specifically relating to the consideration of applications for the awarding of radio frequency spectrum licenses for competing applications?

Questions A 7 and B 7

Which other policy imperatives ought to guide the Authority in determining the procedures and criteria contemplated in section 31(3) of the Act specifically relating to the consideration of applications for the awarding of radio frequency spectrum licenses where there is insufficient spectrum available to accommodate demand?

In the event that interested parties consider that there are other pertinent issues not canvassed throughout the Discussion Document pertaining [to] the process contemplated in section 31(3), the Authority invites such interested parties to submit their respective views.

- 3.3. Within the Discussion Document, the Authority had detailed that interested persons wishing to submit written representations ought to forward such submissions to the Authority by no later than 16h00 on the 30th November 2006. In total, the Authority received 33 written submissions, of which 19 indicated their willingness to participate in public hearings in the event that the Authority was inclined to convene such public hearings. In this regard, the Authority duly convened public hearings from the 28th to the 30th of March 2007 with the view of obtaining further representations from interested parties in relation to the questions posed in the Discussion Document and any other views which may be relevant and related to the regulatory process at hand.

4. THE REASONS DOCUMENT

- 4.1. Within the Discussion Document, the Authority had indicated that the findings, recommendations and conclusions following the public hearings would be published in the Government Gazette pursuant to section 4(6) of the ICASA Act. On the 17th June 2008, the Authority, in General Notice NO. 748 of Government Gazette NO. 31150 published its decision following the inquiry in terms of section 31(3) of the Act ("the Reasons Document").
- 4.2. The Authority received 25 written representations from interested persons in relation to the preliminary views expressed by the Authority in the Reasons Document.
- 4.3. The Reasons Document sought to consolidate the responses which the Authority had received from interested persons in relation to the Discussion Document. Furthermore, the Reasons Document sought to propose the manner in which the Authority would proceed in the completion of the regulatory process, and which factors the Authority would consider in prescribing the procedures and criteria for the granting of the radio frequency spectrum in the designated ranges.

5. THE STATUS OF THE REASONS DOCUMENT

- 5.1. Within the Reasons Document, the Authority pronounced on certain aspects of the consultative process pertaining to the prescription of a methodology for the granting of the radio frequency spectrum pursuant to section 31(3) of the Act. In this regard, it is important to note that while the Authority has published a Reasons Document which aims to elaborate on the process which the Authority intends embarking upon which would ultimately culminate in the prescription of the methodology as envisaged by section 31(3), the Authority is nonetheless of the view that it is not legally curtailed in reconsidering any of the positions pronounced in the Reasons Document.
- 5.2. The Authority is of the view that where it considers that any determinations, preliminary decisions or positions which it has pronounced upon throughout the course of a regulatory process are reflective of some

deficiencies which may ultimately result in such regulatory process not being sufficiently transparent or fair, that it would be prudent for the Authority to take the necessary steps to provide as much clarity and certainty as possible with regards to the substantive rationale for the determinations, decisions or positions to be adopted by the Authority. Furthermore, the Authority is of the view that where throughout the course of further deliberative processes it is of the view that certain positions which it had previously adopted or pronounced upon are no longer tenable or sustainable, that it may reasonably reconsider such views or positions with the view of arriving at decisions which are both workable and which have been arrived at as a result of the Authority having properly applied its mind and having had recourse to all relevant considerations put before it.

- 5.3. In this regard, the Authority is of the view that certain positions pronounced within the Reasons Document have become untenable and have thus warranted reconsideration. Therefore, the purpose of this document is to provide the rationale for the manner in which the Authority intends proceeding in the prescription of a methodology in accordance with section 31(3) of the Act and matters related to the granting of the radio frequency spectrum in the designated ranges. Furthermore, the purpose of this document is to provide the necessary substantiation for all the positions which the Authority intends adopting so as to demonstrate the manner in which the Authority has arrived at its decisions pertaining to this regulatory process.

6. THE AUTHORITY'S INTERPRETATION OF SECTION 31(3) OF THE ACT

- 6.1. The Authority is of the view that it is pertinent to articulate on its interpretation of section 31(3) of the Act, particularly on the manner in which the Authority has interpreted the Legislature's intention on the reasonable implementation of the provision. In this regard, the Authority is of the view that an articulation of the interpretation of section 31(3) of the Act would serve to also provide some substantive guidance on the processes which may be necessary to embark upon in the final granting of the radio frequency spectrum pursuant to the procedures and criteria contemplated in section 31(3) of the Act.

7. PRESCRIPTION OF DIFFERENT METHODOLOGY FOR GRANTING OF A LICENCE

- 7.1. The Authority is of the view that section 31(3) of the Act permits the Authority to prescribe a different methodology for the granting of the radio frequency spectrum in the instances contemplated in section 31(3) of the Act. The Authority is further of the view that the Legislature intended for the Authority to prescribe different methodology for the granting of the radio frequency spectrum in those instances detailed in section 31(3) of the Act, due in part, to the peculiarities of those instances envisaged in section 31(3) of the Act..
- 7.2. However, while the Authority readily accepts the cogency of having to prescribe a different methodology for the granting of the radio frequency spectrum in instances as envisaged in section 31(3) of the Act, the Authority equally accepts that the Act does not purport to provide any substantive guidance on the nature and procedural disposition of such different methodology. Instead, section 31(3) of the Act enjoins the Authority, in prescribing such different methodology, to have recourse to the objects of the Act which are detailed in section 2 of the Act.
- 7.3. The Authority is of the view that the objects of the Act are sufficiently broad to encompass the prescription of either a comparative evaluation methodology, a competitive evaluation methodology or a combination of both for the granting of the radio frequency spectrum in those instances envisaged in section 31(3) of the Act. Furthermore, the Authority is of the view that when determining whether or not a comparative evaluation methodology, a competitive evaluation methodology or a combination of both would present the most appropriate and suitable manner of assigning the radio frequency spectrum within designated ranges, it shall have recourse to the objects of the Act as conceptual substantive guiding principles in arriving at such a methodology.

8. PRESCRIPTION OF THE DESIGNATED RANGES OF THE RADIO FREQUENCY SPECTRUM

- 8.1. The Authority is of the view that section 31(3) of the Act contemplates that the Authority, having prescribed the necessary methodology pursuant to section 31(3) of the Act, must firstly determine whether or not within certain ranges of the radio frequency spectrum there exists competing applications, or whether or not there exists an inelastic availability or supply of the radio frequency spectrum relative to aggregate demand. In considering these two issues, the Authority is of the view that it may be reasonable to have recourse to the revealed preferences of prospective licensees who would have expressed a positive inclination towards accessing the radio frequency spectrum. It is on this basis that the Authority is of the view that such revealed preferences may suffice in quantifying and computing the aggregate demand for access to the designated ranges. Here, the Authority is of the view that the quantification and computation of the aggregate demand by having recourse to revealed preference may be one of many other mechanisms for the estimation of aggregate demand for designated ranges.
- 8.2. Secondly, once the Authority has determined that certain ranges of the radio frequency spectrum bands amount to those envisaged in section 31(3) of the Act and are to be subjected to different methodology for their assignment, the Authority is obliged to communicate to interested persons seeking access to such designated ranges that a methodology as contemplated in section 31(3) shall be applicable for the granting of the radio frequency spectrum within the designated ranges.
- 8.3. Thirdly, the Authority is of the view that once it has determined that the granting of certain radio frequency bands falls within the ambit of section 31(3) of the Act, that a process for the granting of such bands must be initiated by the Authority through publishing in a Government Gazette the designated ranges of the radio frequency spectrum, which shall be assigned in accordance with the methodology which has been prescribed by the Authority pursuant to section 31(3) of the Act.

9. SUMMARY

- 9.1. The Authority has sought to advance its interpretation of the manner in which section 31(3) of the Act ought to be implemented. The proceeding analysis seeks to provide the necessary substantiation for the positions

which the Authority intends adopting so as to demonstrate the manner in which the Authority has arrived at its decisions pertaining to this regulatory process. The structure of the remainder of this document shall be presented as follows:

- Section A shall provide a synopsis of the responses from interested persons received by the Authority in relation to questions A1 to A7 of the Authority's Reasons Document and the positions pronounced in relation to questions A1 to A7. After having provided a synopsis of the responses, the Authority shall advance its determination on each of the questions posed in the Discussion Document. Here, the determinations may significantly deviate from the positions advanced in the Reasons Document, and in such instances, the Authority shall endeavour to advance the substantiations on the reasons for such deviations;
- Section B shall provide a synopsis of the responses from interested persons received by the Authority in relation to questions B1 to B7 of the Authority's Reasons Document and the positions pronounced in relation to questions B1 to B7. Similarly, and after having provided a synopsis of the responses, the Authority shall advance its determination on each of the questions posed in the Discussion Document. Here again, the determinations may significantly deviate from the positions advanced in the Reasons Document and, in such instance, the Authority shall endeavour to advance the substantiations on the reasons for such deviations; and
- Section C shall provide a summary of all the determinations which the Authority proposes to adopt as the substantive decisions which shall guide the Authority in its implementation of section 31(3) of the Act.

9.2. The Authority wishes to state that the purpose of providing the synopsis of the respective views expressed by interested persons is to provide the context within which interested persons have comprehended the Authority's questions and preliminary views. Furthermore, where the Authority provides the synopses, such synopses are not to be perceived

as amounting to the comprehensive expression of interested persons' respective views. For the purposes of convenience the Authority shall not seek to comprehensively restate the positions advanced by interested persons, but rather provide a concise articulation of the cumulative sentiments expressed by interested persons on matters which seemingly evoked significant contentious responses.

SECTION A**GRANTING OF THE RADIO FREQUENCY SPECTRUM WITHIN THE 2.6 GHz RANGES****SYNOPSIS OF THE RESPONSES TO THE AUTHORITY'S DETERMINATIONS
QUESTION A 1, QUESTION A 2 AND QUESTION A 3**

1.
 - 1.1. In determining the amount of the radio frequency spectrum which ought to be assigned to a prospective license, the Authority is of the considered view that, notwithstanding that Question A1, Question A2 and Question A3 amounted to different considerations in a hypothetical preponderance, the underlying essence of their respective inquiries are inherently interrelated. In this regard, it is readily discernable that the determination of the minimum amount of the radio frequency spectrum to be assigned to a prospective licensee intrinsically determines the number of prospective licensees that are to be assigned the residual radio frequency spectrum, particularly where the residual radio frequency spectrum is in a fixed quantity. Therefore, a determination of Question A1 inherently lends to a consequential determination of Question A3, notwithstanding the determination regarding Question A2.
 - 1.2. The Authority received 25 responses to the determinations detailed in the Reasons Document. The Authority wishes to extend its sincere gratitude to those interested persons who submitted written responses in relation to the Reasons Document. Furthermore, the Authority wishes to assure such interested persons that the Authority has had recourse to the substantive rationale which underpinned all the submitted written representations in arriving at its final determinations.
 - 1.3. In response to the Authority's determination regarding Question A1 pertaining to the manner in which the residual radio frequency spectrum within the 2.6 GHz frequency ranges ought to be assigned, the Authority notes that all respondents held divergent views regarding the amount of the radio frequency spectrum which would be required for an electronic communications network services licensee to deploy an efficient network for the provision of electronic communications services. The views

expressed by the respondents varied greatly, though there existed a convergence of mutual sentiment regarding the insufficiency of 20 MHz as an optimum granting of the radio frequency spectrum for an efficient deployment of an electronic communications network.

- 1.4. Several of the respondents alluded to the manner in which the European Conference of Postal and Telecommunications Administrations ("CEPT") had determined the segmentation of the band in relation to the duplex methods in order to accommodate the mutual co-existence of differentiated technological applications. On the basis of the CEPT determination, several respondents proposed that the Authority consider various scenarios and options which would ultimately result in an equitable granting of the radio frequency spectrum. Furthermore, several respondents proposed that the Authority consider the reduction and augmentation of the radio frequency spectrum currently assigned to Sentech Limited and Wireless Business Solutions (Pty) Limited, respectively.
- 1.5. With regards to the optimum amount of the radio frequency spectrum which ought to be assigned to a single licensee, the views of the respondents were divergent. However, notwithstanding the divergence, there existed some consensus as to the minimum amount of the radio frequency spectrum required to deploy an efficient and commercially viable electronic communications network within the designated ranges. In this regard, the prevailing consensus amounted to 30 MHz for either Time Division Duplex ("TDD") or Frequency Division Duplex ("FDD") methods. One respondent sought to substantiate the minimum required radio frequency spectrum on the basis of the acceptability of the grade of service that may be attained with such an assignment, while at the same time taking into account the spectral re-use factor relative to the channel sizes. Furthermore, the respondent detailed the anticipated operational cost and equipment costs for a variety of options based on sector-deployment and channel sizes.
- 1.6. Another respondent stated that a minimum granting of 30 MHz in channels of 10 MHz would enable a more efficient utilisation of the radio frequency spectrum, since 10 MHz channel sizes are considered to be the optimum channel bandwidth in relation to transmission throughout relative to the

number of base stations. Furthermore, a granting of 30 MHz as opposed to the Authority's stipulated 20 MHz would result in the possibility of re-using the third channel.

- 1.7. The Authority also notes that much of the elaborative discussions on the manner in which the residual radio frequency spectrum ought to be segmented in relation to duplexing methods sought to persuade the Authority in having to pronounce on its preferred duplexing method which the Authority would determine as being the most suitable and appropriate for the granting of the radio frequency spectrum. In this regard, the Authority noted the divergent views relating to the professed efficiency of technological applications utilising FDD methods as opposed to technological applications utilising TDD methods. In particular, the Authority notes that there exists considerable bias on the part of those persons who are engaged in the manufacture and design of technological applications utilising either FDD or TDD duplexing methods in proposing objectively determined observations on the suitability of either duplexing methods.
- 1.8. These seemingly commercially biased representations were unusually contradictory. On the one hand, their initial assertions expressed an unambiguous commitment to the principle of technological neutrality, while on the other hand explicitly advocating for a particular duplexing method that the Authority ought to prescribe in relation to the manner in which the band ought to be segmented.
- 1.9. In this regard, the Authority wishes to state unequivocally that it is of the considered view that in advocating for the promotion of the principle of technological neutrality, that this would necessarily entail that the Authority would refrain from pronouncing on its preferred duplexing method in relation to the amount of the radio frequency spectrum that ought to be assigned to technological applications utilising a particular duplexing method.
- 1.10. In determining the positions which the Authority wishes to adopt in relation to Question A1, Question A3 and Question A3, it is important to provide the context within which such determination must necessarily be arrived at. The Authority is of the view that, having adopted a technological

neutrality position regarding the granting of the residual radio frequency spectrum, it is prudent to arrive at a determination regarding these questions which seeks to advance such a principle, taking into consideration the possible technical parameters which are capable of promoting such a principle. At the centre of the principle of technological neutrality, particularly within the context of the manner in which a regulatory authority ought to assign the radio frequency spectrum is an aversion to "technological determinism" and allowing for a sufficient amount of flexibility for prospective licensees to endogenously determine a technological application relative to their estimation of the aggregate demand for the electronic communications services offered through that particular technological application. Mindful of this, the Authority is of the view that a prescription of variable thresholds relating to technical parameters which would allow for the co-existence of a heterogeneity of technological applications which provides such flexibility would amount to a dynamic and prudent manner to proceed upon in arriving at determinations to Question A1, Question A2 and Question A3.

- 1.11. In the foregoing analysis, the Authority shall provide further substantiation as to the manner in which it has arrived at its determinations to the questions, as well as the technical context within which such determinations are to be appreciated. As a precursor, the Authority is of the view that since its substantive determinations are principally premised on the principle of technological neutrality, it is apt for the Authority to elaborate on its conception of the principle, and its applicability within the context of spectrum assignment in general, and in particular in relation to section 31(3) of the Act.

2. THE PRINCIPLE OF TECHNOLOGICAL NEUTRALITY

- 2.1. The principle of technological neutrality entails the probability of transmitting heterogeneous electronic communications services upon a single electronic communications network. This probability is underpinned by the existence of a relative degree of functional interchangeability of differentiated network transmission architectures and topologies which are capable of rendering the provision of functionally similar electronic communications services. Within the context of the radio frequency spectrum, the principle of technological neutrality espouses the notion that

regulatory treatment for access to the radio frequency spectrum ought not to be discriminatory on the basis of the technological application which a prospective licensee intends deploying. Similarly, the Authority is acutely aware that from a radio frequency planning perspective, the traditionally conceived spectrum allocations for certain technological applications are increasingly capable of accommodating differentiated technological applications which, although possessing different network topologies, are nonetheless functionally interchangeable with regards to the nature and type of electronic communications services which may be rendered.

2.2. Furthermore, the Authority has noted that an ever increasing multitude of transmission network architectures are capable of being deployed within the same spectrum allocations and that co-existence of these different technological solutions, irrespective of their duplexing methodologies, is increasingly possible. In this regard, the Authority has noted that the supply elasticity for technology transmission networks has increasingly become relatively elastic, which has resulted in the availability of a multitude or relatively similar and functionally equivalent services situated at the retail level which are capable of being offered through interchangeable network transmission platforms. Within this backdrop, it has become increasingly imprudent to sustain the traditional authorisation regime of regulating the licensing of access to the radio frequency spectrum on the basis of the nature and disposition of the architectural topology of an electronic communications network. This is even so where regard is had to the underlying rationale for the introduction of convergence legislation, which has the aim of eradicating the different regulatory treatment accorded to technology transmission platforms on the supposition that such differentiate treatment is no longer warranted given the increasing flexibility of such transmission platforms to offer a heterogeneity of competing electronic communications services.

2.3. However, the adoption of the technological neutrality approach necessarily entails that appropriate regulatory measures are introduced which would provide the necessary conducive regulatory environment for the promotion of such a principle. The Authority is of the view that such regulatory measures may include the in-band migration of current licensees within the 2.6 GHz frequency ranges so as to ensure the current assignments within the band are rationalised in accordance with the proposed

segmentation of the band in FDD and TDD portions. Failure to consider the in-band migration as a potentially necessary regulatory measure may result in the further fragmentation of the band, and lead to unjustifiably inequitable assignments of the residual radio frequency spectrum within the designated ranges. Should the Authority consider that such in-band migration is necessary, the current licensees within the designated ranges shall be adequately consulted prior to the Authority invoking the necessary legislative provisions to effect such in-band migration.

THE AUTHORITY'S DETERMINATION REGARDING QUESTION A 1, QUESTION A 2 AND QUESTION A 3

3. ALIGNMENT WITH THE INTERNATIONAL TELECOMMUNICATIONS UNION ALLOCATIONS OF THE RADIO FREQUENCY SPECTRUM AND OTHER REGION 1 JURISDICTIONS

- 3.1. It is important to note that the granting of the radio frequency spectrum within the designated ranges must be fulfilled with a coherently organised table of frequency allocations as prescribed by the Authority pursuant to section 34(3) of the Act. In this regard, the Authority is cognisant that the granting of the radio frequency spectrum within the designated ranges must necessarily occur within an orderly planned national table of frequency allocations which would allow for the co-existence of a multitude of technological applications capable of delivering a variety of electronic communications services and broadcasting services.
- 3.2. Furthermore, it is important to have regard to the International Telecommunications Union's ("ITU") allocations for Region 1 when determining the potential for co-existence of technological applications within designated ranges. The Authority is of the view that it would be imprudent to assign the radio frequency spectrum within designated ranges without having regard to the potential harmful interference which may ensue as a result of the operation of a multitude of technological applications possessing different propagation characteristics and network architectural topologies. Therefore, the Authority's determination in this regard is primarily guided by the preoccupation of assigning the radio frequency spectrum in an orderly manner allowing licensees the maximum

flexibility in the manner in which they utilised the assigned radio frequency spectrum.

- 3.3. With regards to the prescription of the technical parameters necessary to avoid harmful interference where there is co-existence between different technological applications utilising different duplexing methods, it is particularly instructive that the CEPT produced a report to the European Commission in response to a mandate to develop least restrictive technical conditions for frequency bands addressed in the context of the European Commission's wireless Access Policy for the Electronic Communications Services ("the CEPT Report No. 19"). The CEPT Report No. 19 has been developed by the CEPT as a response from the European Commission with regards to the investigation of four broad areas regarding 5 identified frequency bands, of which the 2500 – 2690 MHz and the 3400 – 3600 MHz are constituents.
- 3.4. While it is not necessary to state the four broad areas which the CEPT Report No. 19 sought to investigate, nonetheless for the Authority's purposes in relation to the regulatory process envisaged by section 31(3) of the Act, it suffices to allude to those aspects of the CEPT Report No. 19 which the Authority considers to be instructive and pertinent.
- 3.5. While it is not the purpose of this document to elaborate on the rationale and policy justifications for the European Commission's Wireless Access Policy for Electronic communications Services ("WAPECS"), nonetheless it is important to acknowledge one of the pertinent considerations for WAPECS. In this regard, the CEPT Report No. 19 states that an important constituent of WAPECS entails:

"... the need for an investigation of the technical and operational conditions required to avoid harmful interference in the frequency bands identified [and the] basic technical approached, how technical aspects of spectrum usage rights can be described in a way, that usage of spectrum is as less as possible restricted by technology-specific requirements."

- 3.6. Here, the Authority is of the view that these considerations regarding the prescription of the least restrictive technical conditions for spectrum usage

rights for the purposes of avoiding harmful interference is an important aspect for the determination of the manner in which the designated ranges are to be apportioned and segmented. In this regard, these technical conditions serve to determine the extent to which the different technological applications may co-exist within adjacent spectrum bands while simultaneously avoiding or mitigating against the transmission of emissions which may cause harmful interference. These technical conditions are developed through rigorous compatibility and sharing studies with the ultimate aim of prescribing technical parameters which ensure that different technological applications may co-exist in adjacent bands and that the frequency spectrum assigned for such technological applications is utilised in an efficient manner.

- 3.7. The Authority is also mindful that the adoption of the technical conditions in relation to the apportionment of the designated ranges must necessarily ensure that such conditions are proportionately the least restrictive parameters and do not directly or indirectly serve to determine the nature and type of electronic communications services that may be operated. This is important that it ensures that the notion of technology neutrality is sustained as an underlying principle regarding spectrum assignments.
- 3.8. The Authority is mindful that the prescription of the technical conditions by the European Commission has been developed within the context of adopting a more enabling regulatory framework which permits and encouraged a market-orientated approach towards the efficient utilisation of the radio frequency spectrum. While the Authority is appreciative of the economic and regulatory rationale and the policy imperatives for the adoption of such a framework, it is important for the Authority to categorically state that the adoption of the technical parameters is solely confined to the prescription of the segmentation of the designated ranges of the purposes of stipulating the least restrictive technical conditions necessary for the avoidance of harmful interference.
- 3.9. When adopting such technical conditions, the Authority is mindful that there exists a trade-off between the provision of maximum flexibility for licensees to use their assigned spectrum rights in a commercially viable manner, and the necessity for the avoidance or mitigation against harmful interference. While the former prerogative is important in ensuring that

effective competition ensures in the provision of electronic communications services to end-users and subscribers, the latter is also an important concept of orderly spectrum management. In seeking to attain an equitable balance between these seemingly agnostic ideals, the Authority is of the view that the technical conditions to be adopted for the designated ranges shall form part of the radio frequency spectrum licence conditions which the Authority shall, from time to time, monitor and enforce licensees' compliance thereof. In prescribing the technical conditions in the manner proposed, the Authority is also of the view that such an approach does not deviate from the established authorisation procedures in relation to the granting of the radio frequency spectrum, in particular the stipulation of technical parameters as terms and conditions to which the assigned radio frequency spectrum shall be utilised by licensees.

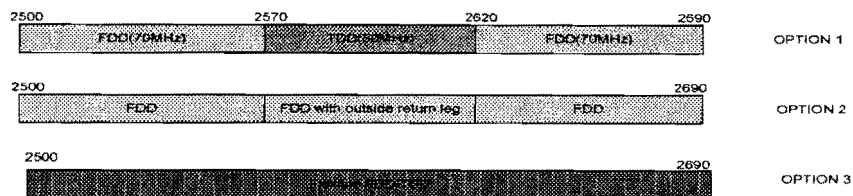
- 3.10. The Authority is also of the view that the technical parameters to be prescribed as licence conditions must necessarily detail the in-block and out-of-block emission limitations which must be appropriately determined so as to ensure mutual co-existence between different technological applications.

4. SEGMENTATION OF THE 2.6 GHz FREQUENCY RANGES

- 4.1. The Authority notes that the radio frequency spectrum within the ranges from 2500 – 2690 MHz has been allocated by the ITU for broadband wireless access applications pursuant to ITU- R M. 1036. The Authority's decision to allocate the spectrum on a technology neutral basis gained universal support as this was seen as being in accordance with international trends. The emphasis was placed on the need for the Authority to adopt a band plan that provides for the co-existence of FDD and TDD technologies. A guidance in this respect is provided by the ITU-R Recommendation M1036 which recommends the following frequency arrangements for the 2.6GHz

Figure 1.

**PRESENTATION OF 2.6GHz BAND SEGMENTATION OPTIONS IN TERMS OF
ITU-R RECOMMENDATION M1038**



Option 1- FDD with TDD centre gap of 50MHz

Option 2 -FDD with FDD centre gap paired with external downlink.

Option 3 – Flexible FDD/TDD. Administrations can use the band solely for TDD or FDD or some combination of TDD and FDD

As for option 1, the historical assignment for Sentech and Wireless Business Solutions (Pty) Ltd (WBS) makes it untenable. Option 2 is out of consideration since it is technology specific. Option 3 is preferable since it is very flexible and caters for technology neutrality. It allows for some combination of TDD and FDD.

There would however be a need to consider a reconfiguration of the band for co-existence of the two duplex technologies. Should this be warranted one also need to take into cognisance the prior historical assignment of the band to Sentech and WBS

4.2. The Authority considers that the proposed spectrum allocation within the designated range amounts to a rationalised segmentation of the band. Furthermore, the proposed spectrum allocation also enables the potential co-existence of different duplexing methods which would ensure that competing technological network architecture may be suitably deployed.

4.3. As is readily discernable from the proposed spectrum allocation of the designated range, the Authority proposes that where prospective

licensees intend to deploy terminals for transmission applications using FDD methods, that the up-link transmission terminals be deployed in the lower portion of the band, while the down-link transmission terminals be deployed in the upper portion of the band.

- 4.4. The Authority is acutely mindful that the sub-segmentation of the radio frequency spectrum along duplexing methods amounts to an initial step in determining the manner in which the designated band shall be organised. In this regard, the Authority is of the view that the manner in which the band is organised is inherently related to the number of licenses that may be assigned, and equally the amount of the radio frequency spectrum that may be assigned to each licensee. In its endeavour to allow the market mechanism as far as possible to efficiently determine the number of licenses available and the nature and type of electronic communications services to be rendered, the Authority is of the view that rather than determine the number of licenses to be awarded, that it would preferably to determine the upper threshold of the radio frequency spectrum that may be assigned to a single person. In this regard, the Authority is of the view that the spectrum assigned to a single person will be 30 MHz for both FDD and TDD applications.

5. SYNOPSIS OF RESPONSES TO THE AUTHORITY'S DETERMINATIONS

QUESTION A 4, QUESTION A 5 AND QUESTION A 6

- 5.1. In response to Question A 4 regarding the procedures and criteria pursuant to which the Authority may assign the residual radio frequency spectrum, there were divergent views in relation to the rationale for the adoption of either a comparative evaluation process or a competitive evaluation process. Some respondents were of the view that this may be the most appropriate administrative process to adopt due to its inherent flexibility. On the other hand, some respondents were of the view that the

adoption of a market-orientated approach in the form of a competitive evaluation process was more suitable given the nature and inherent value of the residual radio frequency spectrum. Furthermore, these respondents pointed to the relative efficiency of a competitive evaluation process and its perceived invulnerability from prolonged litigation processes which may have the adverse effect of delaying the granting of the radio frequency spectrum.

6. THE AUTHORITY'S DETERMINATION REGARDING QUESTION A 4, QUESTION A 5 AND QUESTION A 6

6.1. The Authority has determined that to make use of the following processes:

- a purely comparative evaluation process; or
- a purely competitive evaluation process; or
- a combination of the two. For ease of reference, the Authority shall refer to combination of the competitive and comparative evaluation processes as truncated granting methodology.

6.2. The Authority's rationale for the addition of a truncated granting methodology is underpinned by an acute realisation of the internal deficiencies which embody either a purely competitive evaluation process, or a purely comparative evaluation process. With regards to the inherent deficiencies of a purely competitive evaluation process, these amount to the following:

- The hazard for collusively determined outcomes which amount to sub-optimum granting of the radio frequency spectrum;
- The propensity for the over-valuation of the radio frequency spectrum whereupon there may exist a pass-through for recoupment of the sunk-costs to retail end-users or subscribers, and
- Due to asymmetric valuation of the radio frequency spectrum between incumbents and new entrants, non-marginal cost bidding may present an exogenous barrier to entry for new entrants.

- 6.3. On the other hand, the inherent deficiencies of a purely comparative evaluation process are as follows:
- The propensity for a distorted appreciation of the inherent value of the radio frequency spectrum by a regulatory authority based upon an incomplete estimation of aggregate demand for the services to be rendered as a result of access to the radio frequency spectrum, and
 - The propensity for a comparative evaluation process to be inherently subjective and opaque.
- 6.4. While the Authority does not consider that a purely competitive evaluation process or a purely comparative evaluation process is not unsuited for adoption pursuant to section 31(3) of the Act, nonetheless the Authority is mindful of the probability of the distorted outcomes that each respective process is capable of conjuring. Mindful that access to the radio frequency spectrum is a critical factor for the provision of different retail electronic communications services by new entrants as competitive constraints to those services provided by incumbent licensees, the Authority views the prescription of an granting methodology which is devoid of any exogenous and endogenous barriers to entry as being particularly important.
- 6.5. Equally, the Authority is also mindful of the potential for asymmetric valuation of the radio frequency spectrum between incumbent licensees and new entrants on the basis of the respective differentiated incentives. While on the one hand, an incumbent licensee's incentive for access to the radio frequency spectrum may amount to a desire to provide a degree of differentiation to its current services and thus provide intra-competitive constraints to the incumbent licensees' services.
- 6.6. The Authority considers that the proposed granting methodology is appropriately conceived to advance the endeavour of promoting effective competition and lower barriers to entry for access to the radio frequency spectrum. The Authority is also of the view that the manner in which the granting methodology has been contemplated ensures that the functional procedures are clear, while at the same time providing a heightened degree of transparency and the necessary competitive incentives for

applicants to utilise the radio frequency spectrum in an efficient and dynamically innovative manner.

6.7. The Authority will prescribe the extent of inclusion of historically disadvantaged individuals (HDI's) in the following areas:

- Minimum thirty percent (30%) ownership by historically disadvantage individuals.
- Levels participation in management and control.
- Affirmative procurement.

SECTION B**GRANTING OF THE RADIO FREQUENCY SPECTRUM WITHIN THE 3.5 GHz FREQUENCY RANGES****SYNOPSIS OF THE RESPONSES TO THE AUTHORITY'S DETERMINATIONS****QUESTION B 1, QUESTION B 2 AND QUESTION B 3**

1.1 In section A paragraph 1.1, the Authority expressed the view that:

"...notwithstanding that Question A 1, Question A2 and Question A 3 amounted to different considerations in a hypothetical preponderance, nonetheless the substance of their inquiry are inherently interrelated. In this regard, it is readily discernable that the determination of the minimum amount of the radio frequency spectrum to be assigned to a prospective licensee that are to be assigned the residual radio frequency spectrum, particularly where the residual radio frequency spectrum is in a fixed quantity. Therefore, a determination of Question A 1 inherently lends to a consequential determination of Question A 3, notwithstanding the determination regarding Question A 2. "

1.2 The Authority proposes to follow the logic advanced in Section A in determining the minimum amount of the residual radio frequency spectrum to be assigned to prospective licensees within the 3.5 GHz frequency ranges.

1.3 The Authority wishes to note that there existed significantly more interest in the granting of the residual radio frequency spectrum within the 2.6 GHz ranges than the 3.5 GHz ranges. This observation is reflected in the number of interested persons who elected to submit significantly more detailed written representations only in relation to the 2.6 GHz ranges while declining to comment on the Authority's preliminary positions regarding the 3.5 GHz ranges. All in all, the Authority received 25 responses to the determinations detailed in the Reasons Document. In particular, and in response to the Authority's determination regarding Question B 1 pertaining to the manner in which the residual radio frequency spectrum within the 3.5 GHz ranges ought to be assigned, the Authority notes that the respondents held divergent views regarding the amount of the radio frequency spectrum which would be required

for an electronic communications network services licensee to deploy an efficient network for the provision of electronic communications services.

1.4 The views expressed by the respondents did vary, though not significantly, from the Authority's proposed position. In particular, while there existed significant convergence regarding the Authority's determination of assigning the residual radio frequency spectrum on a geographically spatially separated basis, there were three significant observations submitted by interested persons which may be summarised as follows:

- That the residual radio frequency spectrum ought to be segmented into 14 MHz non-contiguous lots for both uplink transmission and downlink transmission, which would be consistent with the current band segmentation as detailed in the South African Table of Frequency Allocations. This Proposal that the radio frequency spectrum be granted in the following manner:
 - 2 x 15 MHz assigned per municipality area.
- That further licensing within the 3.5 GHz ranges ought to proceed with much caution since there exists adjacent occupancy of Fixed Satellite Services ("FSS") applications which may experience harmful interference. The respondent proposed that the frequency ranges from 3400 – 3700 MHz be reserved and assigned exclusively for FSS applications, and
- That in the event that the Authority had implicitly reserved the residual radio frequency spectrum for municipal authorities, that the proposed segmentation into 2 x 15 MHz may be superfluous, and that a more efficient granting would amount to 2 x 7.5 MHz, where the radio frequency spectrum is used to render the provision of internal electronic communication services to municipal authorities.

2. Residual radio frequency spectrum ought to be segmented into 4 MHz non-contiguous lots

With regards to the arrangement of the radio frequency spectrum within the 3.5 GHz ranges, the Authority is of the view that a more appropriate sub-

segmentation of the radio frequency spectrum ought to be in rasters or multiples of 7 MHz. Such a sub-segmentation would be consistent with the current arrangement of the 3.5 GHz ranges. Indeed, bearing cognisance that the residual radio frequency spectrum within the 3.5 GHz ranges amounts to a total of 56 MHz, a sub-segmentation of the and into rasters or multiples of 7 MHz would be mathematically prudent.

3 Reservation of the residual radio frequency spectrum for FSS applications

The Authority is cognisant of the allocation for FSS applications within the extended 3.5 GHz ranges and is of the view that while the causation of harmful interference ought to be avoided between different technological applications operated in adjacent bands, or mitigated through the adoption of efficient interference mitigation techniques, nonetheless the Authority is also cognisant of the technical feasibility relating to the actual co-existence of a multitude of applications within the frequency ranges commencing from 3400 – 3700 MHz. Of most importance is the actual co-existence between different applications within the frequency ranges commencing from 3400 - 3700 MHz without the causation of harmful interference. Therefore, the Authority is of the view that there exists insufficient uncontroverted evidence which has been presented to the Authority throughout the course of this regulatory process which would persuade the Authority to reserve the 3.5 GHz ranges for the exclusive allocation for FSS applications.

With regards to the contention that the 3.5 GHz ranges ought to be reserved on an exclusive basis for the allocation of FSS services, the Authority is of the view that such a proposition is short-sighted and does not contain sufficiently well reasoned substantiations on the technical unfeasibility of co-existence between different applications within the 3.5 GHz ranges. To this end, the Authority is not persuaded of the absolute necessity to reserve the 3.5 GHz ranges on an exclusive basis for FSS application and is of the view that the licensing of broadband wireless access applications (subject to acceptable technical parameters) within the 3.5 GHz ranges shall not unduly cause harmful interference to a significant magnitude as to necessitate the migration of all other applications.

4 Consideration of assigning 2, 7.5 MHz lots for municipal authorities' internal usage

At the outset, the authority is of the view that it would be imprudent to detail the identity of persons to whom the radio frequency spectrum within the 3.5 GHz ranges may be assigned, nor the intended modality of utilising the assigned radio frequency spectrum. In particular, where one respondent had insinuated that the Authority has implicitly determined the identity of licensees within the 3.5 GHz frequency ranges shall necessarily be municipal authorities, for the avoidance of any doubt, the Authority has not predetermined the identity of prospective licensees within any of the frequency ranges subject to the regulatory process at hand. This view does not serve to curtail such municipal authorities from participating in the regulatory process for the granting of the radio frequency spectrum in the 3.5 GHz ranges.

Indeed, the requirements of section 31(3) of the Act intrinsically compel the Authority to embark upon a granting process in instances where the identity of prospective licensees is unascertainable and is not revealed until a radio frequency spectrum licence is granted.

5 THE AUTHORITY'S DETERMINATION REGARDING QUESTION B 1, QUESTION B 2 AND QUESTION B 3

The Authority is of the view that the concerns from respondents detailed above have been adequately addressed and clarified and the Authority's determinations may be summarised as follows:

With regards to the maximum threshold for the amount of the radio frequency spectrum that may be assigned to one person, the Authority is of the view that the sub-segmentation of the band shall be arranged in rasters or multiples of 7 MHz, with the maximum threshold of the radio frequency spectrum to be assigned being 28 MHz irrespective of the duplexing method.

While there existed overall consensus amongst interested persons of the Authority's determination regarding the granting of the residual radio frequency spectrum on a geographic spatially separated basis, and more specifically along municipality catchment areas, the Authority is of the view that such a determination must necessarily be reconsidered. In this regard, the Authority is of the view that due to

the inherent propagation characteristics of the radio frequency spectrum and the spatially distributed concentrations of the population throughout the Republic of South Africa, that a more dynamic and consequently less rigid determination of the geographically separated catchment areas within which the residual radio frequency spectrum may be assigned ought be adopted.

Here, the Authority is of the view that a thorough appreciation of the propagation characteristics of applications to be deployed within the 3.5 GHz ranges and the topographic characteristics of the geographic catchment areas with which such applications shall be deployed is critically important. Therefore, the Authority is of the view that while it may make a determination with regards to the minimum amount of the radio frequency spectrum that is available, and the limitation of the number of licenses which are available for granting on the exact limitation of the propagation must necessarily be determined on a more robust and flexible manner.

In this regard, the Authority proposes that the salient factors which ought to guide the determination of the geographic catchment areas amount to the following:

- The population density of an expanded geographic catchment area;²
- The maximum propagation limitations for all geographic catchment areas;
- The maximum interference contour for a single geographic catchment area, and
- The field strength limitations applicable to all geographic catchment areas.

With regards to the population density, the Authority has considered that since the concentration of settlements are usually insensitive to local or district municipal boundaries, that where there exists a relatively densely populated geographic catchment area which transcends such boundaries, that a relevant geographic catchment area may be prescribed by the Authority for the granting of the radio frequency spectrum within the 3.5 GHz ranges.

Since the Authority envisages the prescription of relevant geographic catchment areas which transcend district municipal boundaries, local municipal boundaries and provincial boundaries, the Authority is of the view that both class electronic communications network services licensees and individual electronic communications network services licensees may participate in the granting process for the radio frequency spectrum within the 3.5 GHz ranges.

Furthermore, such relevant geographic catchment areas may overlap where the interference contours of each relevant geographic catchment area's interference contours overlap. However, adherence to the field strength limitations and propagation limitations shall be important in the endeavour to avoid or mitigate against the causation of harmful interference between licensees.

The prescription of a relevant geographic catchment shall be determined from a centre point at which the population density is at its highest concentration within a local municipal area. The radius for all relevant geographic catchment areas shall be determined as amounting to a range of between 0 – 150 kilometres from the centre point of the population density of a local municipal area.

The computation of the population density is determined as the number of persons per square kilometre within a local municipal area. However, the population density of an expanded geographic area which transcends beyond prescribed local municipal boundaries may also be designated as a relevant geographic catchment area for the granting of the radio frequency spectrum within the 3.5 GHz ranges.

The prescription of the applicable interference contour shall be determined on the basis of a radius from the centre point of a relevant geographic catchment area. The radius for all interference contours shall be determined as amounting to a range of between 150 – 200 kilometres from the centre point of all geographic catchment areas.

The permitted field strength limitation in relation to the interference contours for all relevant geographic catchment areas shall be prescribed as the applicable terms and conditions for the radio frequency spectrum licence.

6 SYNOPSIS OF THE RESPONSES TO THE AUTHORITY'S DETERMINATIONS QUESTION B 4, QUESTION B 5 AND QUESTION B 6

The Authority notes that the preponderance of respondents who professed a view on the questions pertaining to the 2.6 GHz ranges and 3.5 GHz ranges, in responding to Question B 4, B 5 and B 6 largely referred the Authority to their respective responses to Questions A 4, A5 and A 6. The Authority shall not repeat the synopsis of those responses since they are detailed at paragraph 5 above.

7 AUTHORITY'S DETERMINATION REGARDING QUESTION B 4, QUESTION B 5 AND QUESTION B 6

The Authority notes that since it has not been presented with a significantly compelling justification against the adoption of the three granting methodology (i e purely competitive, purely comparative and a combination of the two (truncated methodology) for the granting of the residual radio frequency spectrum within the 3.5 GHz ranges, it is of the view that there exists no persuasive underlying principle that its determination is not correct. Indeed, on the basis of the revealed preference for access to the 3.5 GHz ranges, the aggregate demand for such access far exceeds the availability of the radio frequency spectrum, which has been identified as being in a fixed quantity of 56 MHz. Therefore, the Authority is of the view that one of the granting methodologies shall be applied to the granting of the radio frequency spectrum within the 3.5 GHz ranges.

SECTION C

1.1. The Authority proposes to adopt the following determinations with regards to the regulatory process initiated by the Authority pursuant to section 31(3) of the Act, that:

1.1.1. With regards to the 2.6 GHz ranges.

- The configuration of the designated ranges commencing from 2500 MHz to 2690 MHz be segmented in accordance with Figure 1 above. Figure 1 graphically represents the segmentation of the designated ranges into sub-segmentations accordingly arranged for FDD methods and TDD methods;
- On Question A2 - The radio frequency spectrum licences shall be assigned on a national basis;
- On Question A3 – Given the fact that only 126 MHz is left and 30MHz will be assigned to each operator, only four national operators can be licensed.
- On Question A1 - The upper threshold of the radio frequency spectrum which a person may be assigned amounts to 30 MHz for both FDD and TDD methods. A licensee will receive a maximum of 30MHz for TDD and TDD methods.
- On Question A4 - The number of radio frequency spectrum licences to be granted shall be determined by the Authority and granted in terms of one of the granting methodologies detailed in 6.1 of Section A.;
- The Authority shall invoke the necessary statutory provisions to facilitate the in-band migration of the incumbent licensees with the designated range in order to attain a measure of equitable granting of the radio frequency spectrum;
- The granting methodology shall be published in the form of a regulation and will include requirement for a minimum of 30% shareholding by Historically disadvantaged individuals
- Once the granting methodology comes into effect as a Regulation, the Authority shall commence with the functional procedures detailed in the Regulation which shall culminate in the granting of the radio frequency spectrum within the designated ranges.
- The Authority has determined that in case where the licenced radio spectrum remain unused for considerable amount of time an principle of use it or lose it will apply.

1.1.2.

With regards to the 3.5 GHz ranges:

- On question B2 -The radio frequency spectrum licences shall be granted within designated relevant geographic catchments areas;
 - ON Question B1 -The upper threshold of the radio frequency spectrum which a person may be assigned amounts to 28 MHz for either FDD or TDD methods;
 - The segmentation of the designated ranges is in the form of multiples of 7 MHz rasters for both FDD methods and TDD methods;
 - On Question B4, B5, B6 The number of radio frequency spectrum licences to be granted shall be determined by the Authority and granted in terms of one of the granting methodologies detailed in 6.1 of Section A.;
 - The granting methodology shall be published in the form of a regulation and will include requirement for a minimum of 30% shareholding by Historically disadvantaged individuals
 - The Authority has determined that in case where the licenced radio spectrum remain unused for considerable amount of time an principle of use it or lose it will apply.
-