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Dr S S Mncube
Chairperson of ICASA Council,
Block B, Pinmill Farm
164 Katherine Street
Sandton
2146

For attention: Mr Manyapelo Richard Makgotlho
Email: rmakgotlho@icasa.org.za

26 September 2012

Dear Dr Mncube,

Re: Written Representations on Draft Frequency Migration Regulation
and the Radio Frequency Migration Plan

These representations are made to ICASA by the South African SKA Project Office in response to the invitation to submit written representations regarding the Draft Frequency Migration Regulation and the Radio Frequency Migration Plan as published in General Notice No. 606 in the Government Gazette No. 35598 on 17 August 2012.

The South African SKA Project Office (SASPO) has been established by the Department of Science and Technology and the National Research Foundation to facilitate the establishment of new radio astronomy operations in South Africa as approved by the South African Cabinet. South Africa has been selected by the SKA Organisation to accommodate the major portion of the SKA Radio Telescope in Southern Africa. The MeerKAT radio telescope developed by South Africa as a precursor to the SKA telescope will be incorporated in SKA Phase 1. The MeerKAT and the core of the SKA will be established in the vicinity of Carnarvon and Williston in the Northern Cape Province.

The written representations are included in the document attached hereto, titled "Written Representations by the SA SKA Project Office on Frequency Spectrum Migration". The document includes two annexures.



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SASPO wishes to thank ICASA for the opportunity to make written representations and support the initiative to improve the radio frequency spectrum regulatory framework. SASPO is available to continue its participation in an oral hearing or in any other process that ICASA may engage in.

Regards

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26 September 2012

Written Representations by the South African SKA Project Office on Frequency Spectrum Migration

1. Introduction

- 1.1. The purpose of the representations is to make proposals that may facilitate the alignment of the regulation of the radio frequency spectrum by ICASA and the protection of the Karoo Central Astronomy Advantage Areas¹ (AAAs). In so doing, the administration of the use of the radio frequency spectrum within the declared areas would be as simple and as smooth as possible. Whereas ICASA wishes to licence the use of the radio frequency spectrum within the spectrum regulatory framework, the protection of the declared astronomy advantage areas requires that frequency spectrum use, and transmission activities therein, be restricted to curb radio frequency interference detrimental to radio astronomy observations.
- 1.2. The representation includes a brief overview of the protection framework for core and central AAAs, regulations to be made to govern the protection and proposals for inserts in the ICASA Frequency Migration Regulation and in the Radio Frequency Migration Plan.

2. Overview: Protection for radio astronomy observations²

- 2.1. The development and protection of radio astronomy in South Africa is governed by the Astronomy Geographic Advantage Act (Act No. 21 of 2007) (AGA Act).
- 2.2. A document entitled “Explanatory Memorandum for the Declarations and the Regulations Relating to the Karoo Core and Central Astronomy Advantage Areas” is attached as Annexure A. This document is being distributed to all landowners in the Karoo Central AAAs together with the draft notice for the declaration of the areas. The document provides a summary of the protection scheme, its current status of implementation and the protection measures to be applied.
- 2.3. Extensive consultation processes are prescribed in the AGA Act as described in the Explanatory Memorandum. Concurrence with ICASA is required where measures are prescribed that affect

¹ Karoo Central Astronomy Advantage Areas (Karoo Central AAAs) are destined to be declared in terms of section 9 of the Astronomy Geographic Advantage Act (Act No. 21 of 2007). The areas are depicted in Annexure A.

² The information provided in this section is a summary and does not reflect the full detail included in the draft regulations. This information has no legal standing.



broadcasting services and broadcasting service licensees. A register of interested and affected parties must be established for each declared astronomy advantage area. Registered entities must be consulted where regulations are being made to protect the declared areas. The invitation to register as an interested and affected party was gazetted³ and a copy of the current version of the invitation is attached as Annexure B.

- 2.4. The AGA Act also prescribes that ICASA must not issue any broadcasting service licence or any radio frequency spectrum licence where radio frequency interference will be caused in a core or central astronomy advantage area, unless the licence conditions make provision for the protection of such areas⁴.

2.5. Protection level regulations

2.5.1. Radio Astronomy Protection Level Regulations⁵ define the South African Radio Astronomy Service (SARAS) protection levels by means of two equations to be used to calculate the required protection level at any frequency between 70 MHz and 25.5 GHz. The protection levels were derived from ITU recommended protection criteria used for astronomical measurements⁶. The geographical locations at which the protection levels are to be applied will be specified in the regulations prescribing the protection measures.

2.6. Karoo Central AAAs Spectrum Regulations and Regulations on Procedural Matters for the Central Astronomy Advantage Areas

2.6.1. The application of protection for radio astronomy within the Karoo Central AAAs is quite complex. The approach used is not to restrict all spectrum use, but to allow limited radio communication within the Karoo Central AAAs in a controlled manner that would minimise radio frequency interference to radio astronomy and to maximise efficient use of the radio frequency spectrum.

³ Notice to invite Interested and Affected Parties to the Proposed Astronomy Advantage Areas to register in the Permanent Register in terms of the Astronomy Geographic Advantage Act published in Government Gazette No. 33328 on 2 July 2010.

⁴ Refer section 22(6) of the AGA Act

⁵ Regulations on radio astronomy protection levels in astronomy advantage areas declared for the purposes of radio astronomy were published in Notice No. R.90 in Government Gazette No. 35007 on 10 February 2012.

⁶ Recommendation ITU-R RA.769-2.

2.6.2. Draft regulations will be published for public comment following the declaration of the areas, and will prescribe restrictions on the use of the radio frequency spectrum and conducting radio communication within the Karoo Central AAAs. A period of one year will be provided to comply with the following measures after which licensees and licence exempt operators may not continue with their activities unless prescribed conditions are complied with:

- a. Restriction on the use of the spectrum from 100 MHz to 10 GHz, and engaging in radio communications by licensees or licence exempt operators, unless use of the specific spectrum has been exempted and a permit in relation to the use thereof, and engaging in radio communication, has been issued. Existing use of the spectrum between 100 and 200 MHz, and the use of two 8 MHz bands in the UHF television broadcasting band, will be exempted subject to the possession of a permit. Restriction on the use of the spectrum between 10 and 25.5 GHz is to be imposed in the same manner from a date to be published in a notice by the Minister.
- b. Insofar as spectrum use is concerned, the objective is to maximise and protect interference free radio frequency spectrum within the designated spectrum. A process will be conducted to determine which frequency bands within the designated spectrum should be exempted. This will involve public consultation, and with the registered entities, after advance consultation with ICASA. As far as practically possible, existing spectrum users will be bundled into a limited number of frequency bands determined in the consultation process. Users outside those bands will need to migrate into the bands to be exempted.
- c. The issuing of a permit will be subject to an application by the licensee or licence exempt operator with a compliance assessment and an evaluation, all in a defined manner.
- d. Conditions to be applied when granting permits will be that effective radiated powers exceeding 60 dBm, saturation level radio frequency interference exceeding minus (-) 120 dBm/Hz at radio astronomy stations and radio frequency interference exceeding the protection level at the Karoo Core Centre will not be allowed.
- e. Provision is made for essential radio communication services, to be determined in consultation with ICASA, that exceed the protection level radio frequency interference at the Karoo Core Centre to be exempted after an optimisation process had been conducted.



3. Comments on the Draft Radio Frequency Migration Regulation

It is proposed that the following items are inserted into the regulation in order to make provision for, and to link it to, the protection measures to be prescribed in regulations for radio astronomy protection that are to be promulgated in in terms of the AGA Act.

3.1. Item 3 – Principles

Add sub item (7) – *Frequency migration may be required in core and central astronomy advantage areas in terms of section 22(2)(c) of the Astronomy Geographic Advantage Act (Act No. 21 of 2007).*

3.2. Item 4 – Process

Add sub item (f) – *Where a South Africa specific requirement must be accommodated, such as that arising from protecting radio frequency spectrum for radio astronomy purposes in core and central astronomy advantage areas in terms of the Astronomy Geographic Advantage Act (Act No.21 of 2007).*

4. Comments on the Draft Radio Frequency Migration Plan

It is proposed that the following items are inserted into the Radio Frequency Migration Plan in order to make provision for, and to link it to, the protection measures to be prescribed in regulations for radio astronomy protection that are to be promulgated in in terms of the AGA Act.

4.1. Section 1 – Introduction

Add sub section 1.3 – *Spectrum use in the Karoo Central Astronomy Advantage Areas*

The radio frequency spectrum use in the Karoo Central Astronomy Advantage Areas to be declared in the Northern Cape Province must be protected for radio astronomy purposes in terms of the Astronomy Geographic Advantage Act (Act No.21 of 2007). Section 22 of the AGA Act provides specifically for Restrictions on use of radio frequency spectrum in astronomy advantage areas. The protection measures will be prescribed in Regulations to prohibit and restrict the use of certain radio frequency spectrum and certain activities in the Karoo Central Astronomy Advantage Areas, and in Regulations on procedural and related matters for central astronomy advantage areas. A South Africa specific frequency allocation plan is required for these areas.

4.2. Section 2 – Review of Legislation and Regulations

Add sub section 2.4 - *Astronomy Geographic Advantage Act (Act No.21 of 2007)*

The proceedings of ICASA are also subject to the Astronomy Geographic Advantage Act. This act contains the following provisions that affect the Draft Radio Frequency Migration Plan. Certain subsections in section 22 (Restrictions on use of radio frequency spectrum in astronomy advantage areas) and section 23 (Declared activities in core or central astronomy advantage area,) that are relevant, state the following:

2.4.1 Section 22(1) - the Minister has the authority subject to subsection (2) within a core or central astronomy advantage area to protect the use of the radio frequency spectrum for astronomy observations.

2.4.2 Section 22(2) - Pursuant to the authority granted in subsection (1) and with the concurrence of ICASA, in so far as the Minister's action is likely to affect broadcasting service license or broadcasting service, the Minister may, by notice in the Gazette -

- (a) prohibit completely or restrict in any way the use of specific frequencies within the radio frequency spectrum or the radio frequency spectrum in general within a core or central astronomy advantage area;*
- (b) require the conversion, within a reasonable time period, of analogue transmissions in the radio frequency spectrum within a core or central astronomy advantage area, to digital transmissions;*
- (c) require any user of the radio frequency spectrum which transmits or broadcasts into a core or central astronomy advantage area to migrate onto a radio frequency or utilise alternative technology that more effectively protects radio astronomy observations; or*
- (d) exempt from the provisions of such notice any person or organ of state who has entered into an agreement with the management authority of the core or central astronomy advantage area to mitigate their impact on the radio frequency spectrum within the relevant astronomy advantage area.*

2.4.3 Section 22(6) - Notwithstanding anything contained in any other law, ICASA must not issue a broadcasting service license or a radio frequency spectrum license after the coming into force of this Act where the service to be licensed would cause radio frequency interference in a core or central astronomy advantage area, unless the conditions set out in the license make provision for the protection of such areas.

2.4.4 Section 23(1) - the Minister may, with the concurrence of ICASA where his or her action is likely to affect broadcasting service license or broadcasting service, declare that no person may, in a core or central astronomy advantage area, conduct any activity in any of the following categories (only the items relating to radio frequency spectrum are listed below):

- (b) *the construction, expansion or operation of any fixed radio frequency interference source;*
- (i) *activities capable of causing radio frequency interference, including bringing into the area or operating any interference source, mobile radio frequency interference source or short range device;*
- (k) *any other activity which may detrimentally impact on astronomy and related scientific endeavours, or the astronomy advantage of any core or central astronomy advantage area or may direct that such activities may only be conducted in a core or central astronomy advantage area in accordance with standards or conditions prescribed by the Minister.*

2.4.5 Section 23(2) - Following publication of a declaration under subsection (1), the Minister must review all declared activities which were lawfully conducted in any affected core or central astronomy advantage area immediately before a declaration in terms of subsection (1) was published.

4.3. Section 3 - Principles Governing Frequency Migration

Add subsection 3.4 – Frequency Migration in the Karoo Central Astronomy Advantage Areas

The need for frequency migration in the Karoo Central Astronomy Advantage Areas will be determined by the South Africa specific requirements for protecting the use of the radio frequency spectrum for astronomy observations. The following principles will be applied:

3.4.1 The protected spectrum within a core or central astronomy advantage area will be determined in the declaration of the area in terms of the Astronomy Geographic Advantage Act.

3.4.2 The frequency bands in the protected spectrum to be exempted from the restriction of its use will constitute a frequency allocation plan for the Karoo Central Astronomy Advantage Areas.

3.4.3 The frequency band exemptions will be determined by the relevant management authority designated for the declared areas in terms of the Astronomy Geographic Advantage Act, and will be subject to a public consultation process after advance consultation with ICASA.

3.4.3 The frequency band exemptions will be published in the Gazette after the public consultation had been concluded.

3.4.5 Frequency use outside the exempted frequency bands must migrate to frequencies inside the exempted frequency bands.



5. Comments on possible frequency bands to be exempted (with conditions) from restrictions on frequency spectrum use

The comments below relates to sections 4 (Development of the Radio Frequency Migration Plan) and section 5 (Potential Impact of Spectrum Migration) in the Draft Radio Frequency Migration Plan. The comments are not meant to deal with the detail in these sections, but rather on how the radio frequency spectrum to be used for radio astronomy purposes (100 MHz to 25.5 GHz) needs to be planned to facilitate the required protection for radio astronomy within Karoo Central AAAs and to provide for radio communications where necessary. A South Africa specific frequency allocation plan needs to be established for the Karoo Central AAAs. The draft Karoo Central AAAs Spectrum Regulations to protect the areas will restrict all frequency spectrum use in the areas, but exempt the frequency spectrum bands required for radio communications while still applying the applicable protection levels at the Karoo Core Centre.

The procedures to determine the frequency spectrum bands to be exempted are detailed in the draft Regulations on Procedural Matters for the Central Astronomy Advantage Areas. As preliminary information, the radio frequency bands and the services that need to be considered for exemption for radio communications purposes are set out in the following sub items. Only spectrum from 100 to 960 MHz is addressed in the comments below. No exemptions are contemplated above 960 MHz, however, a possible need for exemptions will be considered as required.

5.1. 100 – 200 MHz

Retain existing frequency band allocations and assignments. New assignments will be subject to compliance with protection criteria.

5.2. 200 to 238 MHz

No exemptions are contemplated. Broadcasting requirements should be accommodated in the band between 174 and 200 MHz.

5.3. 238 to 400 MHz

An exemption for a consolidated band (2 bands – BTX and MTX) for public trunking, rural broadband, public protection and disaster relief (including SAPS, SANDF, ambulance and fire fighting services) with an appropriate capacity will be considered.

5.4. 400 to 470 MHz



An exemption of an appropriate amount of spectrum required for electricity distribution and railway operations will be considered.

5.5. 470 to 694 MHz

Only two frequency bands of 8 MHz each to be used for low power digital terrestrial television transmissions (less than 60 dBm EIRP) are to be exempted.

5.6. 694 to 890 MHz

No exemptions are contemplated.

5.7. 890 to 960 MHz

This band would be exempted for mobile cellular radio communications purposes.

Explanatory Memorandum for the Declarations and the Regulations Relating to the Karoo Core and Central Astronomy Advantage Areas

1. Purpose of this Memorandum

This Explanatory Memorandum seeks to describe the purpose and nature of the declaration of the Karoo Core and Central Astronomy Advantage Areas ("AAAs"), and the regulatory framework for radio astronomy, including the Square Kilometre Array ("SKA"), as simply and as plainly as possible.

The declarations and regulations as finally published in a Government Gazette by the Minister of Science and Technology will have legal effect. However, this Memorandum has no legal standing.

2. Background to the SKA

SKA is a next-generation, cutting edge scientific facility. It is the world's astronomical community's effort to build the largest and most powerful telescope in history. It will consist of 3,000 large antennas, connected via fibre optic infrastructure to a power supercomputer within the Karoo Core AAA. The data will be processed by some of the largest computers in the world, and distributed to research centres around the world. South Africa is currently recognised as a leader in making the SKA a reality. Investment by the international community into the SKA will be in the order of R15 billion, with running costs of R1.5 billion per annum for 50 years of operations.

Approximately 50% of the antenna will be located within the Karoo Core AAA. A further 30% of the antenna will be located within the Karoo Central AAAs along 5 spiral arms. The remaining 20% of the antenna will be located in remote areas across South Africa and 8 other African SKA partner countries.

3. Principles and Methods for the Protection of Radio Astronomy

The SKA will be an extremely sensitive instrument to measure very weak cosmic radio signals received from space. The Northern Cape Province, due to its low population density and relatively low presence of industrial activity, provides an outstanding AAA with relatively little need for improvement.

The Astronomy Geographic Advantage (AGA) Act was promulgated on 17 June 2008, following extensive consultation with government, the telecommunications industry and in the National Assembly, and came into operation on 24 April 2009.

a. Declaration of Three Categories of Protected Areas/AAAs

The Act provides for the declaration by the Minister of three categories of AAAs for the purposes of advancing and protecting radio astronomy in those areas, namely:

- Core AAAs – Typically a very small area, requiring the strictest levels of protection. In the case of the SKA, this is approximately 14,000 hectares.
- Central AAAs – A larger area surrounding the Core area. Established mainly to provide regulatory control of spectrum use, transmissions and harmful activities.
- Co-ordinated AAAs – A much larger area surrounding the Central area. Established to protect the Core area from high powered transmissions.

b. Regulations on the Restriction of Use of Radio Frequency Spectrum and on Conducting Harmful Activities

Restrictions on the use of the radio frequency spectrum, and on conducting harmful activities, are required to enable radio astronomy observations by MeerKAT, the SKA and other observatories located within these areas.

c. Consultation with Landowners and Interested and Affected Parties within the Declared Areas

The AGA Act has specific provisions for consultation with affected parties. These provisions include the following:

1. Before a core or central area is declared, the Minister must –
 - (a) Send a copy of the proposed declaration by registered post to any relevant landowner within the area ;
 - (b) Publish the proposed declaration in the Gazette and a notice thereof in two national newspapers locally available, and invite interested and affected parties to submit written representations or objections within 60 days;
 - (c) Compile a permanent register of interested and affected parties;
 - (d) Where possible, inform in an appropriate manner any other lawful occupier of the land of the proposed declaration and the public participation process.
2. Before prohibiting or restricting radio frequency spectrum use or other declared activities in core or central AAAs, the Minister must –
 - (a) Notify all persons listed in the permanent register of interested and affected parties for the relevant area whose existing rights may be directly affected by the intended action by registered post or another method agreed to.
 - (b) Publish the intended action in the Gazette and a notice thereof in two national newspapers locally available, and invite interested and affected parties to submit written representations or objections within 60 days.

4. Summary of Declarations and Regulations

The following table summarises the declarations and regulations which have been made or are to be made in the near future. The initial drafting of the declarations and regulations was conducted by the Interim Regulations Advisory Committee, established by the Department of Science and Technology. The Committee included representatives from the South African SKA Project Office, government and electronic communications service providers. Further work on these drafts was undertaken by the South African SKA Project Office and external lawyers.

<i>Already Completed</i>	
1	The Minister declared the Northern Cape Province as an AAA on 19 February 2010.
2	The Minister declared the Karoo Core AAA on 20 August 2010 after the public consultation process had been completed.
3	The Minister declared the MeerKAT and the SKA radio telescopes to be astronomy and related scientific endeavours on 15 October 2010.
4	The Minister assigned the management of the Karoo Core AAA to the Department of

	Science and Technology on 3 December 2010.
5	The Minister made regulations on the South African Radio Astronomy Service (SARAS) Protection Levels Standards on 10 February 2012 after the concurrence of ICASA had been obtained and the public consultation process had been completed.
6	The Minister made the Regulations for the protection of all Core Astronomy Advantage Areas declared for the purposes of radio astronomy and related scientific endeavours on 22 June 2012 after the concurrence of ICASA had been obtained and the public consultation process had been completed.
<i>To be Completed in the Near Future</i>	
7	Declaration of the Karoo Central AAAs.
8	Regulations for the Karoo Central AAAs : (a) Restricting the use of radio frequency spectrum and certain activities causing radio frequency interference. (b) Restricting electromagnetic interference related to the generation, distribution and transmission of electricity.
9	Regulations for Procedural Matters for the Central AAAs declared for radio astronomy purposes.

4.1. South African Radio Astronomy Service (SARAS) Protection Levels Standards

The SARAS Protection Levels Standards were derived from an established standard published by the International Telecommunications Union ("ITU"), which is commonly acknowledged by all countries and applied by radio astronomy observatories worldwide. The standards define the protection levels for radio astronomy in the various frequency bands allocated to radio astronomy by the ITU. The SARAS Protection Level Standards are consistent with the methodology prescribed by the ITU.

4.2. Protection of the Karoo Core AAA

4.2.1. Declared Area

The Karoo Core AAA is a relatively small area (14,000 hectares on the farms Los Berg and Mey's Dam – purchased by the National Research Foundation), and accommodates the MeerKAT telescope and the most sensitive components of the SKA (approximately 50% of the antennas).

4.2.2. Protection Regulations

The protection required within the Karoo Core AAA is very high, as it contains the most sensitive part of the radio telescopes. The regulations therefore include the following:

- a. No person may transmit any signal from within the area in the radio frequency spectrum between 9 kHz and 3 000 GHz;
- b. No person may own, possess or control any device, equipment or instrument within the area which emits any signal using radio frequency spectrum between 9 kHz and 3 000 GHz;
- c. No person may conduct any of the activities listed in s23 of the Act relating to radio astronomy within the area.

4.3. Protection of the Central AAAs

4.3.1. Declared Areas

The three Karoo Central AAAs to be declared are illustrated in the map below and the accompanying draft declaration. The sizes of the three areas are frequency dependant. That is, the regulations prescribed pertain only to transmissions or activities which produce interference in the frequency band related to each area. These frequency bands are as follows: Karoo Central AAA 1 (100 MHz to 2170 MHz – including television, radio and GSM), Karoo Central AAA 2 (2170 MHz to 6000 MHz – including broadband wireless connectivity), and Karoo Central AAA 3 (6000 MHz to 25 500 MHz – including point-to-point radio links). The shape and size of the three areas take into account surrounding hills, which offer protection to the radio astronomy facilities, and where possible exclude the dense distribution of GSM communications.

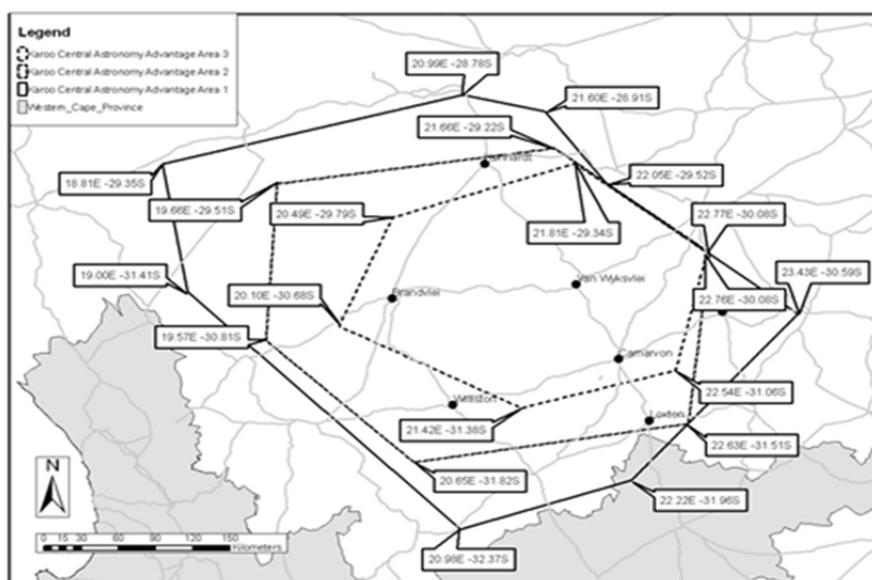


Figure 1: Map of Karoo Central AAAs

4.3.2. Protection Regulations to be Made for Use of Radio Frequency Spectrum

Radio transmissions, such as those from broadcasting, GSM, two-way radio, etc. have the potential to cause radio frequency interference to radio astronomy observations. The higher the power level of transmissions and elevation of transmitting antenna, the greater the chance of interference. The primary purpose of the protection regulations for the Karoo Central AAAs is to protect the Karoo Core AAA, which accommodates the MeerKAT and the most sensitive part of the SKA from excessive radio frequency interference.

These factors were taken into account when the draft regulations were compiled. Primary consideration was given to the need to maintain and improve access to electronic communications services in the area. An ideal environment for radio astronomy was not pursued, and compromises have also been made to allow for the presence of essential services. The draft regulations provide for the following:

- a. Within one year after the regulations are promulgated, use of the spectrum between 100 MHz to 10 GHz will be restricted, unless specific frequency use has been exempted (either in the Spectrum Regulations or according to a procedure in the Procedural Regulations). At a future date to be notified, the restricted spectrum will be extended from 10 GHz to 25.5 GHz.

- b. Existing transmissions in the spectrum from 100 MHz to 200 MHz will be allowed to continue, but new transmissions will be restricted to limit radio frequency interference to within the SARAS Protection Level Standards.
- c. An exemption will be provided for two digital television transmission channels (between 470 MHz and 862 MHz), and essential services (such as cellular communications, mobile communications for safety and security, aeronautical services etc.). Such exemptions are required to comply with protective measures to ensure that no damage is caused to radio astronomy receivers. A service is not essential if a functionally alternative and economically feasible technology exists which will result in a lower detrimental impact to radio astronomy observations.
- d. Migration from analogue television to digital television must comply with the national programme for the migration to digital terrestrial television according to the Digital Migration Regulations due to be published in the latter part of 2012.
- e. A permit will be required to construct, upgrade, expand or operate any fixed sources of radio frequency interference, or conduct activities capable of causing interference, within the radio frequency spectrum specified to be restricted. A permit will not be granted if transmissions in the area exceed the protection levels prescribed by the SARAS, as measured at the Karoo Core AAA (unless these transmissions have been exempted).

4.3.3.Procedural Regulations

Procedural Regulations for the Central AAAs will prescribe the procedures to be followed, and conditions or criteria to be applied, when the protection conditions prescribed by the regulations in the preceding section are applied. They provide for the following:

- a. Procedures for exemption of restricted radio frequency spectrum required for use, firstly at the initiative of the management authority, and secondly at the initiative of an individual applicant.
- b. Requirements for a permit and compliance assessment to carry out radio transmissions, including the various technical criteria, information required and assessment process.
- c. Procedures and criteria for financial compensation.

4.3.4.Regulations Restricting Electromagnetic Interference relating to Electricity Generation, Distribution and Transmission

Another type of radio frequency interference is referred to as electromagnetic interference (EMI), which occurs from certain electrical activities. The distance over which this interference occurs is generally short (of the order 5km-10km) when compared to interference from radio transmissions. Due to the broadband nature of the interference, it affects very large parts of the radio frequency spectrum.

These regulations will apply to the Karoo Central AAA 1, and will only apply to new activities related to the generation, distribution and transmission of electricity. The regulations exclude electricity generating facilities with a maximum capacity of 2000 Watts, so as to allow for wind chargers and solar cells found at homes. The reason why only new infrastructure is addressed is because the SKA configuration has already taken into account existing infrastructure and towns. The provisions in the draft regulations include the following:

- a. All new installations are prohibited, unless a permit has been granted in advance according to the procedures and criteria prescribed in the regulations. This permit will require infrastructure to be separated from any radio astronomy station by a distance determined in the assessment process.
- b. EMI may not exceed the protection levels as prescribed in the SARAS Protection Levels Regulations.

- c. The tip of a turbine blade on a large-scale wind-driven electrical turbine generator may not be within line of site of the top edge of a radio telescope (15m above ground), unless alternative criteria are determined during the assessment process.

5. Access to Radio Communications Services

The protection measures described in the preceding sections were necessary to create a protected radio environment for the MeerKAT and SKA telescopes. The limited radio frequency interference in the Northern Cape Province, including some improvement to be brought about by the application of the protective measures, provides a good operating environment for radio astronomy operations. At the same time, an attempt has been made to provide for the continued use of radio communications services by all the parties involved. A summary of the available options is described below:

- a. Existing digital satellite broadcasting services (DStv, SABC/Sentech-Vivid and TopTV) will not be affected by the protection measures, and will continue to be receivable in the Northern Cape Province.
- b. Coverage of available FM radio services will not be affected.
- c. Multiple low powered digital television transmitters will be used at towns where economically feasible as determined by the broadcasting service providers to replace the existing high powered analogue television transmissions that will be closed down as a part of the digital television migration process. These transmitters will provide better population coverage, and wider selection of free-to-air television services. Reception from satellite will in any case be available where the new transmitters cannot reach,
- d. Access to cellular phone services in and around towns will not be affected. However areas near the Karoo Core AAA will be affected. Where cellular connections at farms may have been lost, most could be restored by certain measures on advice by MTN and Vodacom. Remaining farms can be serviced by the use of VSAT facilities.
- e. A mobile telecommunications system is being deployed at frequencies below the operating range of the SKA (similar to the frequency band used by Marnet).
- f. It is expected that the growth of fibre optic infrastructure in the area, and carefully engineered radio links, will promote the availability and access to high capacity and good quality data and voice electronic communication services in due course.

GUIDELINES AND INFORMATION TO REGISTER AS AN INTERESTED AND AFFECTED PARTY FOR THE KAROO OR SUTHERLAND CENTRAL ASTRONOMY ADVANTAGE AREAS

1. INTRODUCTION AND BACKGROUND

- 1.1. The Minister of Science and Technology has invited, on two occasions, interested and affected parties to register in the permanent registers of interested and affected parties for astronomy advantage areas ("AAAs") (refer Notice 89 of 2010 published in Government Gazette No. 32916 on 5 February 2010 and Notice 649 of 2010 published in Government Gazette No. 33328 on 2 July 2010).
- 1.2. The AAAs will be declared by means notices in the Government Gazette, initially with a notice of the intention to declare and inviting interested and affected parties to submit written representations on or objections to the intended declaration. The notice will include a description of the areas to be declared. The declaration of the central AAAs can only be done after the conclusion of the consultation process.
- 1.3. Interested and affected parties are urged to register as soon as possible, but are not obliged to do so. A failure to register will not disqualify you from any future consultations but it may result in you not being given personal notice of all intended action in terms of this Act within one or more AAAs.

If you have already registered, you do not need to do so again.

If at any time after you have registered you wish to change or add to any of the information you provided when registering, you may do so.

- 1.4. Once you have completed the form attached to this document, the form must be sent to Ms Lipuo Mothae at:

Dept of Science and Technology
Building 53 ,CSIR Campus
Meiring Naude Road
Brummeria
Pretoria

Or

Dept of Science and Technology
Private Bag X894
Pretoria
0001

Or

Email address lipuo.mothae@dst.gov.za

Enquiries can be made at telephone number 012 843 6463

2. PERMANENT REGISTER

The Act requires the Minister to compile a permanent register of interested and affected parties for the central AAAs (for greater detail see s9(3)(a) of the Act). The permanent registers will include details concerning interested and affected parties. Parties listed in a permanent register must be consulted by the relevant management authority or notified by the Minister of certain intended actions to be taken in terms of the Act.

3. DESCRIPTION OF THE KAROO AND SUTHERLAND CENTRAL AAAs

The descriptions of the areas to be declared are included in the notices for the intention to declare these areas.

4. INTERESTED AND AFFECTED PARTIES

Any person may be an "interested and affected party". For example, an interested and affected party may be –

- a person living or employed within an AAA;
- the owner or occupier of a house or other fixed property within an AAA;
- the owner of a farm or person in control of farming operations within an AAA;
- conducting a business or commercial activities within an AAA; or
- a local, provincial or national government entity within an AAA.

5. DETAILS IN THE PERMANENT REGISTERS

(1) You are not required to provide all the details requested in the registration form attached as Appendix A to this schedule. However, you are encouraged to provide as many of these details as possible.

(2) If a party has multiple interests in relation to an AAA, the details may be provided in a spread sheet form (for example in Microsoft Excel).

- (3) If you require an electronic version of the registration form to be e-mailed to you, please request it from Ms Lipuo Mothae at the email address lipuo.mothae@dst.gov.za.

6. ACCESS TO AND UPDATING OF THE PERMANENT REGISTERS

- (1) Any person, upon request and during the office hours of the Department of Science and Technology, may inspect the permanent register of interested and affected parties for a declared AAA.
- (2) Any person whose details appear in a permanent register may submit a request in writing to Ms Lipuo Mothae (contact details provided in item 1.3) to amend and/or include additional details of that person.

As updated on 22 August 2012

**APPENDIX A
REGISTRATION FORM**

If the person completing this form needs more space for an answer, use additional sheet(s) of paper, or Microsoft Excel

(1) Details of the person completing the form	
Full names	
Identity number	
Postal address	
Telephone numbers (landline & cell)	
Facsimile number	
Email address	
Any other contact details	
Position of the person relative to the interest involved	
Preferred method of written communication (tick option)	<input type="checkbox"/> Registered post <input type="checkbox"/> Another method (specify)
I hereby certify that the information provided is to the best of my knowledge true and correct: Date:.....Signature.....	

(2) Indication of the AAA for which this request for registration in the relevant permanent register of interested and affected parties is made (tick only the relevant block)

If it is not possible to identify for which of the areas described below the interested and affected party requests to be registered, provide in the block at the bottom of the page the best possible description of the geographical location or area for which registration is sought. More detail of the location or area may also be provided in this block

- Karoo Central AAA1 (100 to 2 170 MHz includes broadcasting, GSM/GPRS and 3G/UMTS cell phones and data modem, two-way radio, etc)
- Karoo Central AAA2 (2 170 to 6 000 MHz includes 3G cell phones, etc)
- Karoo Central AAA3 (6 000 to 25 500 MHz)
- Sutherland Central AAA

Description of geographical location or area of interest (alternative to making a selection above or provision of more detail)

(3) Details of why the party is interested or may be affected (e.g. lives or works, owns fixed property, employs employees, and/or conducts a business or commercial activities in the AAA)	
Name of the interested or affected party	
Residential address	
If fixed property owned, Deed of Transfer number, and if a farm, also farm name	
Geographical location or area or GPS of any addresses provided above	
The items that follow (except the last item) are only relevant to registrations in respect of the Karoo Central AAAs 1, 2 or 3.	
Sound/radio broadcasts listened to/ transmitter station	
Television channels viewed/ terrestrial transmitter station or satellite	
Television licence number	
Electronic communications services: landline telephone, fax, data; and/or cellular phone, data, internet; and/or two-way mobile radio; radio links and/or VSAT; etc	
For two-way radio communications and radio links: ICASA licence number	
Any other interest or additional information	

This section is only relevant to registrations in respect of the Karoo Central AAAs 1, 2 or 3.

(4) Details of why local, provincial or national government entities and services and/or parties conducting business or commercial activities in AAA are interested or may be affected	
Name of interested or affected government entity or service, or of business	
Type of service, business or commercial activity	
Geographical location(s) of entity, service, business or commercial activity	
Electronic communications services being used: landline telephone, fax, data; and/or cellular phone, data, internet; and/or two-way mobile radio; radio links; and/or VSAT; etc	
For private two-way radio communications & radio links: ICASA licence numbers	
Any other interest or additional information	

This section is only relevant to registrations in respect of the Karoo Central AAAs 1, 2 or 3.

(5) Details of licensed radio communications network operators interested or affected in the AAA	
Name of licensed network operator	
ICASA electronic communications network service licence category & licence number(s)	
Type of service	
Number of base stations involved & their geographic locations	
Any other interest or additional information	