# Radiocommunications (Unacceptable Levels of Interference — 1800 MHz Band) Determination 2012

*Radiocommunications Act 1992*

The AUSTRALIAN COMMUNICATIONS AND MEDIA AUTHORITY makes this Determination under subsection 145 (4) of the *Radiocommunications Act 1992*.

Dated *26 September* 2012

*Chris Chapman*
signed]
Member

*Brendan Byrne*
[signed]
~~Member~~/General Manager

Australian Communications and Media Authority

## 1 Name of Determination

This Determination is the *Radiocommunications (Unacceptable Levels of Interference — 1800 MHz Band) Determination 2012*.

## 2 Commencement

This Determination commences on 18 June 2013.

*Note* All legislative instruments and compilations are registered on the Federal Register of Legislative Instruments kept under the *Legislative Instruments Act 2003*. See http://www.frli.gov.au.

## 3 Revocation

The *Radiocommunications (Unacceptable Levels of Interference – 1800 MHz Band) Determination 1999* is revoked.

## 4 Purpose

This Determination is made for the purposes of section 145 of the Act and sets out what is an unacceptable level of interference caused by a radiocommunications transmitter operating under a spectrum licence issued in the 1800 MHz band, so as to ensure that high levels of emission from radiocommunications transmitters operated under a spectrum licence are kept within the geographic area and frequency band of the licence.

*Note 1* Under section 145 of the Act, the ACMA may refuse to register a radiocommunications transmitter if it is satisfied that the operation of the radiocommunications transmitter could cause an unacceptable level of interference to the operation of other radiocommunications devices under that or any other spectrum licence, or any other licence.

*Note 2* The ACMA information paper, *Registration of radiocommunications devices under spectrum licences*, (available on the ACMA website: www.acma.gov.au), provides further information about the registration of radiocommunications transmitters under Part 3.5 of the Act.

*Note 3* The ACMA has issued written advisory guidelines under section 262 of the Act about compatibility requirements in relation to the assignment of frequencies to radiocommunications transmitters operated under apparatus licences and the operation of radiocommunications transmitters under spectrum licences. The ACMA will take these guidelines into account during the settlement of interference disputes. Each case will be assessed on its merits. The guidelines do not prevent a licensee negotiating other compatibility requirements with another licensee. The guidelines are:

- *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 1800 MHz Band) 2012*;
- *Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 1800 MHz Band) 2012;* and
- *Radiocommunications Advisory Guidelines (Additional Device Boundary Criteria — 1800 MHz Lower Band) 2012*.

These instruments can be accessed on the ComLaw website: www.comlaw.gov.au.

## 5 Interpretation

(1) In this Determination, unless the contrary intention appears:

***1800 MHz band*** means the following frequency bands:

(a) 1710 MHz – 1785 MHz (the ***1800 MHz Lower band***); and

(b) 1805 MHz – 1880 MHz (the ***1800 MHz Upper band***).

***Act*** means the *Radiocommunications Act 1992*.

***additional device boundary*** in relation to a radiocommunications transmitter or a group of radiocommunications transmitters operated under a spectrum licence, means the device boundary calculated using the additional device boundary criterion specified in Schedule 1 of the *Radiocommunications Advisory Guidelines (Additional Device Boundary Criteria — 1800 MHz Lower Band) 2012*, as in force from time to time.

***area of high mobile use*** means an area described in Schedule 4.

***Australian Spectrum Map Grid (ASMG)*** means the *Australian Spectrum Map Grid 2012* published by the ACMA, as in force from time to time.

*Note* The ASMG can be accessed on the ACMA website: www.acma.gov.au.

***centre frequency***, in relation to a radiocommunications transmitter, means the frequency midway between the lower and upper frequency limits of the transmitter's occupied bandwidth.

***DEM-9S*** means the "*GEODATA 9 Second Digital Elevation Model (DEM-9S) Version 3*" (Australia New Zealand Land Information Council unique identifier ANZCW0703011541) containing modelled terrain height information for Australia, published by Geoscience Australia, as in force from time to time.

*Note* Copies of the DEM-9S can be obtained from Geoscience Australia: www.ga.gov.au.

***DEM-9S cell*** means an individual height element of the DEM-9S.

***device boundary***, in relation to a radiocommunications transmitter or a group of radiocommunications transmitters operated under a spectrum licence, means the device boundary established in accordance with Part 1 of Schedule 2.

***device boundary criterion*** means the value of the mathematical expression calculated in accordance with Part 2 of Schedule 2.

***effective antenna height*** means the effective height of an antenna calculated in accordance with Schedule 3.

***EIRP***, in relation to a radiocommunications device, means the Effective Isotropic Radiated Power of the device.

***emission designator*** means the designation of a radiocommunications transmitter's emission, determined in accordance with section 6.

***fixed receiver*** means a radiocommunications receiver located at a fixed point on land or sea and not designed or intended for use while in motion.

***fixed transmitter*** means a radiocommunications transmitter located at a fixed point on land or sea and not designed or intended for use while in motion.

***Geocentric Datum of Australia 1994*** means the geodetic datum designated as the "Geocentric Datum of Australia (GDA94)" gazetted in the Commonwealth of Australia Gazette No. GN 35 on 6 September 1995.

*Note* The Geocentric Datum of Australia 1994 is a coordinate reference system which replaces the Australian Geodectic Datum. More information on the GDA94 can be obtained from Geoscience Australia: www.ga.gov.au.

***geographic area***, for a spectrum licence, means the area within which operation of a radiocommunications device is authorised under the licence.

***group of radiocommunications receivers*** has the meaning given by section 8.

***group of radiocommunications transmitters*** has the meaning given by section 7.

***Hierarchical cell identifier scheme (HCIS)*** means the cell grouping hierarchy scheme used to describe geographic areas in the ASMG.

***HCIS identifier*** means an identifier used to describe a geographic area in the HCIS.

***horizontally radiated power***, for a radiocommunications device, means the sum of:

(a) the maximum true mean power, in dBm per specified rectangular bandwidth at the antenna connector that is located within the frequency band of the spectrum licence authorising the operation of the radiocommunications device; and

(b) the antenna gain relative to an isotropic antenna in a specified direction in the horizontal plane containing the phase centre of the antenna used with the radiocommunications device, in dBi.

***location***, in relation to a radiocommunications transmitter or group of radiocommunications transmitters, means the location of the transmitter or group of radiocommunications transmitters, as the case may be, calculated in accordance with Schedule 1.

***maximum true mean power*** means the true mean power measured in a specified rectangular bandwidth that is located within a specified frequency band such that the true mean power is the maximum of true mean powers produced.

*Note* The power within a specified bandwidth is normally established by taking measurements using either an adjacent channel power meter or a spectrum analyser. The accuracy of measuring equipment, measurement procedure and any corrections to measurements necessary to take account of practical filter shape factors would normally be in accordance with standard engineering practice.

***mean power*** means the average power measured during an interval of time that is at least 10 times the period of the lowest modulation frequency.

***mobile transmitter*** means a radiocommunications transmitter that is only designed or intended for use while in motion or during halts at unspecified points on land or sea.

***occupied bandwidth***, in relation to a radiocommunications transmitter, means the width of a frequency band having upper and lower limits that are necessary to contain 99% of the true mean power of the transmitter's emission at any time.

***Radio Regulations*** means the 'Radio Regulations' published by the International Telecommunication Union, as in force from time to time.

*Note* Copies of the Radio Regulations can be obtained from the ITU: www.itu.int.

***true mean power*** means:

(a) if an unmodulated carrier is present — the mean power measured while the unmodulated carrier is present; and

(b) if an unmodulated carrier is not present — the mean power measured while transmitted information is present.

(2) In this Determination, unless otherwise specified, the range of numbers that identifies a frequency band includes the higher, but not the lower, number.

*Note* A number of terms used in this Determination, are defined in the Act and unless the contrary intention appears, have the meanings given to them by the Act. Those terms include:

- ACMA
- core condition
- frequency band
- interference
- radiocommunications device
- radiocommunications receiver
- radiocommunications transmitter
- radio emission
- Register
- spectrum licence

## 6 Emission designator

(1) In this Determination, the designation of a radiocommunications transmitter's emission (***emission designator***) is determined using the methods specified in the Radio Regulations.

(2) For the purpose of determining the designation of a radiocommunications transmitter's emission using the methods specified in the Radio Regulations, the references to necessary bandwidth for a given class of emission are taken to be references to the occupied bandwidth of the transmitter.

*Note* At the date of making this Determination, Appendix 1 of the Radio Regulations made provision for determining the designation of a radiocommunications transmitter's emission.

## 7 Group of radiocommunications transmitters

(1) In this Determination, two or more fixed transmitters are a group of radiocommunications transmitters if:

(a) they have the same centre frequency and emission designator;

(b) they are operated for the purpose of communicating with the same radiocommunications receiver or group of radiocommunications receivers;

(c) each has an antenna of the same type, model and manufacturer;

(d) the antenna used with each fixed transmitter is located on the same structure and within 20 metres of the phase centre of all antennas within the group of radiocommunications transmitters; and

(e) the identification number assigned by the ACMA to the antenna used with each radiocommunications transmitter is the same.

(2) A radiocommunications transmitter must not belong to more than one group of radiocommunications transmitters.

(3) The location of a group of radiocommunications transmitters is calculated in accordance with Schedule 1.

## 8 Group of radiocommunications receivers

(1) In this Determination, two or more fixed receivers are a group of radiocommunications receivers if:

(a) they are operated for the purpose of communicating with the same radiocommunications transmitter or group of radiocommunications transmitters;

(b) each has an antenna of the same type, model and manufacturer;

(c) the antenna used with each fixed receiver is located on the same structure and within 20 metres of the phase centre of all antennas within the group of radiocommunications receivers; and

(d) the identification number assigned by the ACMA to the antenna used with each radiocommunications receiver is the same.

(2) A radiocommunications receiver must not belong to more than one group of radiocommunications receivers.

(3) The location of a group of radiocommunications receivers is calculated in accordance with Schedule 1 as if the group of receivers were a group of radiocommunications transmitters.

## 9 Unacceptable level of interference

A level of interference caused by a radiocommunications transmitter operated under a spectrum licence issued for the 1800 MHz band is unacceptable if:

(a) the operation of the transmitter in the 1800 MHz band results in a breach of a core condition of the licence relating to the maximum permitted level of radio emission from the transmitter:

(i) outside the parts of the spectrum the use of which is authorised under the licence; or

(ii) outside the geographic area of the licence; or

(b) any part of the device boundary of the transmitter lies outside of the geographic area of the licence; or

(c) the device boundary of the transmitter cannot be calculated in accordance with Part 1 of Schedule 2; or

(d) the transmitter:

(i) operates in the 1800 MHz Lower band;

(ii) has an antenna with an effective antenna height for any radial n, $he_1(\phi_n)$ greater than 10 metres; and

(iii) operates within an area of high mobile use specified in Schedule 4; or

(e) any part of the additional device boundary of the transmitter lies outside of the geographic area of the licence and the transmitter:

(i) operates in the 1800 MHz Lower band;

(ii) has an antenna with an effective antenna height for any radial n, $he_1(\phi_n)$ greater than 10 metres; and

(iii) operates outside an area of high mobile use specified in Schedule 4; or

(f) the transmitter is a mobile transmitter that operates in the 1800 MHz band with a horizontally radiated power greater than 39 dBm EIRP within the occupied bandwidth of the transmitter; or

(g) the transmitter is a fixed transmitter that operates in the frequency band 1877.5 MHz – 1880 MHz with a horizontally radiated power greater than 50 dBm per 30 kHz.

*Note 1* Emission levels in the frequency band 1877.5 MHz – 1880 MHz are limited to manage unacceptable interference to cordless communications devices in the 1880 – 1900 MHz bands.

*Note 2* Subsection 66 (1) of the Act provides that a spectrum licence must include core conditions specifying the maximum permitted level of radio emissions that may be caused by the operation of radiocommunications devices under the licence (see paragraphs 66 (1) (b) and (d) of the Act).

## 10 Accuracy

Unless otherwise specified, the value of a parameter in Schedules 1, 2 and 3 must be estimated with a level of confidence not less than 95 percent that the true value of the parameter will always remain below the requirement specified in this Determination.

# Schedule 1 Location of a transmitter

(subsection 5 (1))

1. The location of a radiocommunications transmitter, ($l_t$, $L_t$) is the location (by latitude and longitude with reference to the Geocentric Datum of Australia 1994) of the phase centre of the radiocommunications transmitter's antenna.

2. The location of a group of radiocommunications transmitters, ($l_t$, $L_t$) is the location (by latitude and longitude with reference to the Geocentric Datum of Australia 1994) of the centre point between the phase centre of each radiocommunications transmitter antenna within the group.

3. In determining the location of a radiocommunications transmitter, or a group of radiocommunications transmitters, the measurement error should be less than 10 metres.

*Note 1* The ACMA issues site identifiers for established radiocommunications locations available in the Register.

*Note 2* The ACMA provides advice on its website to assist licensees in determining the location and measurement error of a transmitter site in the document *Business Operating Procedure (BOP) – Radiocommunications site data requirements.*

# Schedule 2 Device boundaries

(subsection 5 (1))

## Part 1 Device boundary of a transmitter

1. The device boundary of a single radiocommunications transmitter is established as follows:

Step 1: Calculate the device boundary criterion at each m×500 metre increment along each of the n-degree radials, where:

(a) m is the values 1 through 80; and

(b) n is the values 0 (true north) through 359.

Step 2: For each radial, find the latitude and longitude of the first point (lowest value of m) where either:

(a) RP-MP is less than or equal to 0; or

(b) m is equal to 80.

Step 3: The end point of each radial is the device boundary of the radiocommunications transmitter.

*Note* RP-MP (device boundary criterion) is calculated under Part 2.

2. For a group of radiocommunications transmitters the device boundary is to be calculated as if for a single radiocommunications transmitter. The radiated power (RP) for groups of radiocommunications transmitters is taken:

(a) to be equal for each bearing $\sigma_n$; and

(b) to have a value that is the maximum horizontally radiated power, in any direction, of any radiocommunications transmitter in the group.

## Part 2 Device boundary criterion

The device boundary criterion is the value of the mathematical expression:

RP-MP

where:

*MP* : is $PL(l_{mn},L_{mn}) + LOP - G_r$

*RP* : is the horizontally radiated power, measured in dBm EIRP per 30 kHz, for each bearing, $\sigma_n$,

*LOP* : is the radiocommunications receiver level of protection, set to -115 dBm per 30 kHz,

$G_r$ : is the nominal radiocommunications receiver antenna gain including feeder loss set to 0 dBi,

$PL(l_{mn}, L_{nm})$ : is the propagation loss (dB) set out in Part 3 of the m[th] increment on the n[th] radial.

## Part 3 Calculation of propagation loss

1. In calculating $PL(l_{mn}, L_{nm})$:

*f* : is the nominal frequency of the radiocommunications transmitter, being 1840 MHz.

$h_{gr}$ : is the nominal radiocommunications receiver antenna height above ground level, being 1.5 metres.

$h_{e_m(\sigma_n)}$ : is the transmitter effective antenna height (in metres) as defined in Schedule 3, except:

if $h_{e_m(\sigma_n)} < 1.5$ metres, then $h_{e_m(\sigma_n)} = 1.5$ metres; or

if $h_{e_m(\sigma_n)} > 500$ metres then $h_{e_m(\sigma_n)} = 500$ metres.

$d(l_{mn}, L_{mn})$ : is the distance in kilometres between the location of the radiocommunications transmitter, $(l_t, L_t)$, and the m[th] increment on the n[th] radial $(l_{mn}, L_{mn})$.

2. The propagation loss for the m[th] increment on the n[th] radial is established as follows:

Step 1: Calculate the parameters required

$$a(h_{gr}) = (1.1\log_{10}(f) - 0.7)\min(10, h_{gr}) - (1.56\log_{10}(f) - 0.8) + \max(0, 20\log_{10}(h_{gr}/10))$$

$$b(h_{e_m(\sigma_n)}) = \min\{0, 20\log_{10}(h_{e_m(\sigma_n)}/30)\}$$

$$\alpha = \begin{cases} 1 & d \le 20\,\text{km} \\ 1 + (0.14 + 0.000187 \times f + 0.00107 \times h_{e_m(\sigma_n)})(\log_{10}(d(l_{mn}, L_{mn})/20))^{0.8} & 20\,\text{km} < d \le 100\,\text{km} \end{cases}$$

Step 2: Calculate the propagation loss for the m[th] increment on the n[th] radial

$$PL(l_{mn}, L_{mn}) = 46.3 + 33.9\log_{10}(f) - 13.82\log_{10}(\max\{30, h_{e_m(\sigma_n)}\}) + [44.9 - 6.55\log_{10}(\max\{30, h_{e_m(\sigma_n)}\})](\log_{10}(d(l_{mn}, L_{mn})))^{\alpha} - a(h_{gr}) - b(h_{e_m(\sigma_n)})$$

*Note* The formula in Step 1 and Step 2 use the Modified Hata propagation model from ERC Report 068 published by the European Conference of Postal and Telecommunications Administrations (CEPT) in 2000 and revised in 2002.

# Schedule 3 Effective antenna height and average ground height

(subsection 5 (1))

## Part 1 Effective antenna height of a transmitter

1. If:

   (a) $h_{gt}$ is the vertical height in metres of the phase centre of the fixed transmitter's antenna measured with an error of less than 5 parts in 100 and relative to the point:

      (i) located on the line of intersection between the external surface of the structure supporting the antenna and the surface of the ground or sea; and

      (ii) having the lowest elevation on that line;

   (b) $h_s$ is the sum of the DEM-9S cell height at the location of the radiocommunications transmitter as (defined in Schedule 1) and $h_{gt}$; and

   (c) $h_{ag_m(\sigma_n)}$ is the average ground height of the DEM-9S at each m-increment on each n-radial as calculated in accordance with Part 2;

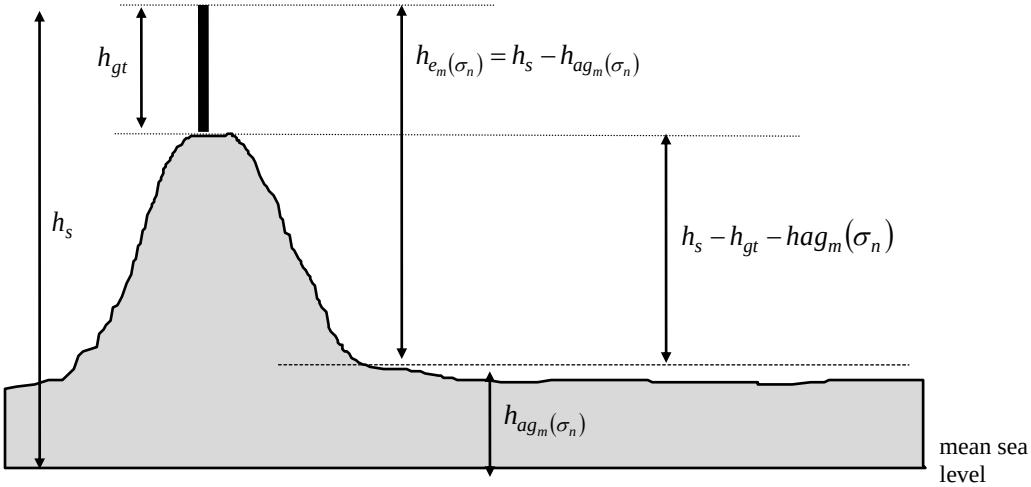
   then the effective antenna height $h_{e_m(\sigma_n)}$ is $h_s - h_{ag_m(\sigma_n)}$ (as shown in Diagram 1) except when $h_s - h_{ag_m(\sigma_n)}$ is less than $h_{gt}$, in which case $h_{e_m(\sigma_n)}$ is $h_{gt}$.

2. For a group of radiocommunications transmitters, $h_{gt}$ is the greatest of the $h_{gt}$ for each individual transmitter in the group, calculated as in 1(a).

3. If the latitude or longitude of the radiocommunications transmitter as defined in Schedule 1 has a modulus of zero when divided by 0.0025, then $h_s$ is the sum of $h_{gt}$ and the maximum height of the adjacent DEM-9S cells.

   *Note* Additional information for the purpose of calculating $h_s$ where the latitude or longitude of the radiocommunications transmitter as defined in Schedule 1 corresponds to a DEM-9S cell boundary, is provided in the document titled '*Digital Elevation Model Interpretation*' available on the ACMA website: www.acma.gov.au.

**Diagram 1 Calculating effective antenna height**




## Part 2 Average ground height

1. The average ground height for the m$^{th}$ increment on the n$^{th}$ radial is calculated as follows:

   Step 1: determine the associated latitude and longitude $(l_{mn}, L_{mn})$ of the m$^{th}$ increment on the n$^{th}$ radial as calculated in Part 3.

   Step 2: identify the DEM-9S cell represented by the latitude and longitude of the m$^{th}$ increment on the n$^{th}$ radial.

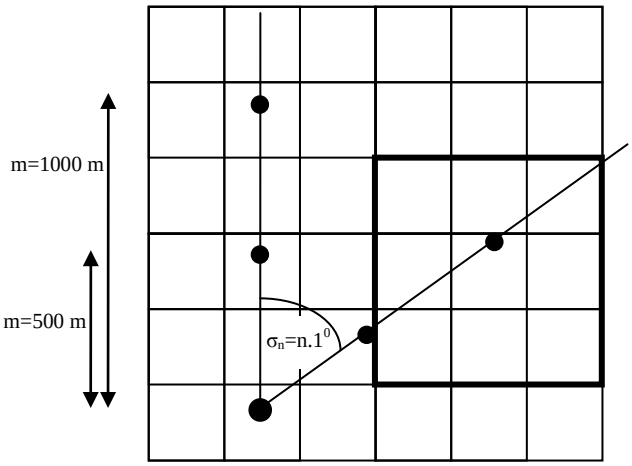
   Step 3: bound the identified DEM-9S cell with the 8 adjacent DEM-9S cells in a 3x3 matrix and obtain each DEM-9S cell height attribute (as shown in Diagram 2).

   Step 4: determine the average value of height from the 3x3 matrix.

2. If the latitude or longitude $(l_{mn}, L_{mn})$ of the m$^{th}$ increment on the n$^{th}$ radial as calculated in Part 3 has a modulus of zero when divided by 0.0025, then the corresponding DEM-9S cell as identified in Step 2 above, is the adjacent DEM-9S cell with the minimum height.

   *Note* Additional information where the associated latitude or longitude of the m$^{th}$ increment on the n$^{th}$ radial as calculated in Part 3 corresponds to a DEM-9S cell boundary is provided in the document titled '*Digital Elevation Model Interpretation*' available on the ACMA website: www.acma.gov.au.

## Diagram 2 Calculating average ground height



## Part 3 Vincenty's Formulae

*Note* This implementation of Vincenty's Direct Formulae uses the parameters $\{a, f_l, b\}$ from the GRS80 ellipsoid as referenced by the Geocentric Datum of Australia1994 (GDA94).

1. In calculating $(l_{mn}, L_{mn})$:

$\underline{l_t}$ : is the latitude of the fixed transmitter (decimal degrees)

$L_t$ : is the longitude of the fixed transmitter (decimal degrees)

α : is the azimuth angle (decimal degrees)

$d$ : is the separation distance to required point (m×500 metres)

$a$ : is the semi-major axis of (6378137 metres)

$f_l$ : is the flattening of (1/298.25722210)

$b$ : is the semi-minor axis of ($a \times (1-f_l)$)

$$e^2 = \left(a^2 - b^2\right) / b^2$$

$$U_1 = \arctan\left(\left(1 - f_l\right) \times \tan\left(l_t\right)\right)$$

$$\alpha_n = \arcsin\left(\cos\left(U_1\right) \times \sin\left(\alpha\right)\right)$$

$$u^2 = \cos^2\left(\alpha_n\right) \times e^2$$

$$A = 1 + \left(u^2 / 16384\right) \times \left(4096 + u^2 \times \left(-768 + u^2 \times \left(320 - 175 \times u^2\right)\right)\right)$$

$$B = \left(u^2 / 1024\right) \times \left(256 + u^2 \times \left(-128 + u^2 \times \left(74 - 47 \times u^2\right)\right)\right)$$

2. Using an initial value $\phi = d / \left(b \times A\right)$, iterate the following three equations until the change in $\phi$ is less than $10^{-12}$.

$$\phi_m = \frac{2 \times l_t + \phi}{2}$$

$$\Delta\phi = \mathrm{B}\sin\left(\phi\right) \times \left\{\cos\left(2\phi_m\right) + \frac{B}{4} \times \left[\cos\left(\phi\right) \times \left(-1 + 2\cos^2\left(2\phi_{\mathrm{m}}\right)\right) - \frac{B}{6}\cos\left(2\phi_m\right) \times \left(-3 + 4\sin^2\left(\phi\right)\right) \times \left(-3 + 4\cos^2\left(2\phi_m\right)\right)\right]\right\}$$

$$\phi = d / \left(b \times A\right) + \Delta\phi$$

3. Then:

$$l_{mn} = \arctan\left(\frac{\sin(U_1)\cos(\phi)+\cos(U_1)\sin(\phi)\cos(\alpha)}{(1-f)\sqrt{\sin^2(\alpha_n)+(\sin(U_1)\sin(\phi)-\cos(U_1)\cos(\phi)\cos(\alpha))^2}}\right)$$

$$\lambda = \arctan\left(\frac{\sin(\phi)\sin(\alpha)}{\cos(U_1)\cos(\phi)-\sin(U_1)\sin(\phi)\cos(\alpha)}\right)$$

$$C = \frac{f}{16}\cos^2(\alpha_n)\left[4+ f_l\left(4-3\cos^2(\alpha_n)\right)\right]$$

$$L = \lambda - (1-C) f_l \sin(\alpha)\left\{\phi + C\sin(\phi)\left[\cos(2\phi_m)+C\cos\phi\left(-1+2\cos^2(2\phi_m)\right)\right]\right\}$$

$$L_{mn} = L_t + L$$

# Schedule 4 Areas of high mobile use

(subsection 5 (1))

## Description of Area

(1) Areas of high mobile use are the areas of land described in Column 1 of the tables below.

(2) An area of high mobile use can be determined by the aggregation of block areas referenced by HCIS identifiers used to describe it which are specified in the corresponding Column 2 of the tables below. Refer to the ASMG for a complete description of the naming convention referred to as the HCIS.

| **Column 1**<br><br>**Name** | **Column 2**<br><br>**HCIS identifiers** |
|---|---|
| Adelaide | IW3J, IW3K, IW3L, IW3N, IW3O, IW3P, IW6B, IW6C, IW6D, IW6F, IW6G, IW6H, IW3E5, IW3E6, IW3E8, IW3E9, IW3F4, IW3F5, IW3F6, IW3F7, IW3F8, IW3F9, IW3G4, IW3G5, IW3G6, IW3G7, IW3G8, IW3G9, IW3H4, IW3H5, IW3H6, IW3H7, IW3H8, IW3H9, IW3I2, IW3I3, IW3I5, IW3I6, IW3I8, IW3I9, IW3M2, IW3M3, IW3M5, IW3M6, IW3M8, IW3M9, IW6A2, IW6A3, IW6A5, IW6A6, IW6A8, IW6A9, IW6E2, IW6E3, IW6E5, IW6E6, IW6E8, IW6E9, JW1E4, JW1E7, JW1I1, JW1I4, JW1I7, JW1M1, JW1M4. |

| **Column 1**<br><br>**Name** | **Column 2**<br><br>**HCIS identifiers** |
|---|---|
| Brisbane | NT9, NT8C, NT8D, NT8G, NT8H, NT8K, NT8L, NT8O, NT8P, NU3A, NU3B, NU3C, NU3D, NU3F, NU3G, NU3H, NT5O4, NT5O5, NT5O6, NT5O7, NT5O8, NT5O9, NT5P4, NT5P5, NT5P6, NT5P7, NT5P8, NT5P9, NT6M4, NT6M5, NT6M6, NT6M7, NT6M8, NT6M9, NT6N4, NT6N5, NT6N6, NT6N7, NT6N8, NT6N9, NT6O4, NT6O5, NT6O6, NT6O7, NT6O8, NT6O9, NT6P4, NT6P5, NT6P6, NT6P7, NT6P8, NT6P9, NU2C1, NU2C2, NU2C3, NU2D1, NU2D2, NU2D3, NU2D5, NU2D6, NU2D8, NU2D9, NU2H2, NU2H3, NU3E1, NU3E2, NU3E3, NU3E5, NU3E6, NU3E8, NU3E9, NU3I2, NU3I3, NU3J1, NU3J2, NU3J3, NU3K1, NU3K2, NU3K3, NU3L1, NU3L2, NU3L3. |

| Column 1<br>Name | Column 2<br>HCIS identifiers |
|---|---|
| Canberra | MW5E, MW4D6, MW4D9, MW4H3, MW4H6, MW4H9, MW4L3, MW5A4, MW5A5, MW5A6, MW5A7, MW5A8, MW5A9, MW5B4, MW5B7, MW5F1, MW5F4, MW5F7, MW5I1, MW5I2, MW5I3, MW5J1. |

| Column 1<br>Name | Column 2<br>HCIS identifiers |
|---|---|
| Darwin | GO7C, GO7D, GO7G, GO7H, GO7K, GO7L, GO8A, GO8E, GO8I. |

| Column 1<br>Name | Column 2<br>HCIS identifiers |
|---|---|
| Hobart | LY9N, LY9I8, LY9I9, LY9J7, LY9J8, LY9J9, LY9K7, LY9K8, LY9M2, LY9M3, LY9M5, LY9M6, LY9M8, LY9M9, LY9O1, LY9O2, LY9O4, LY9O5, LY9O7, LY9O8, LZ3A2, LZ3A3, LZ3B1, LZ3B2, LZ3B3, LZ3C1, LZ3C2. |

| Column 1<br>Name | Column 2<br>HCIS identifiers |
|---|---|
| Melbourne | KX3J, KX3K, KX3L, KX3N, KX3O, KX3P, KX6B, KX6C, KX6D, KX6F, KX6G, KX6H, KX6J, KX6K, KX6L, LX1I, LX1M, LX1N, LX1O, LX4A, LX4B, LX4C, LX4E, LX4I, KX3F7, KX3F8, KX3F9, KX3G7, KX3G8, KX3G9, KX3H4, KX3H5, KX3H6, KX3H7, KX3H8, KX3H9, KX3M6, KX3M8, KX3M9, KX6A2, KX6A3, KX6A5, KX6A6, KX6A8, KX6A9, KX6E2, KX6E3, KX6E5, KX6E6, KX6E8, KX6E9, KX6I2, KX6I3, KX6I5, KX6I6, KX6I8, KX6I9, LX1E4, LX1E7, LX1E8, LX1E9, LX1J1, LX1J4, LX1J5, LX1J6, LX1J7, LX1J8, LX1J9, LX1K4, LX1K7, LX4F1, LX4F2, LX4F4, LX4F5, LX4F7, LX4F8, LX4J1, LX4J2, LX4J4, LX4J5, LX4J7, LX4J8. |

| Column 1<br><br>Name | Column 2<br><br>HCIS identifiers |
|---|---|
| Perth | BV1I, BV1J, BV1K, BV1L, BV1M, BV1N, BV1O, BV1P, BV2I, BV2J, BV2M, BV2N, BV4A, BV4B, BV4C, BV4D, BV4E, BV4F, BV4G, BV4H, BV4I, BV4J, BV4K, BV4L, BV5A, BV5B, BV5E, BV5F, BV5I, BV5J, BV1E7, BV1E8, BV1E9, BV1F7, BV1F8, BV1F9, BV1G7, BV1G8, BV1G9, BV1H7, BV1H8, BV1H9, BV2E7, BV2E8, BV2E9, BV2F7, BV2F8, BV2F9, BV4M1, BV4M2, BV4M3, BV4N1, BV4N2, BV4N3, BV4O1, BV4O2, BV4O3, BV4P1, BV4P2, BV4P3, BV5M1, BV5M2, BV5M3, BV5N1, BV5N2, BV5N3. |

| Column 1<br><br>Name | Column 2<br><br>HCIS identifiers |
|---|---|
| Sydney | MV9I, MV9J, MV9K, MV9L, MV9M, MV9N, MV9O, MV9P, MW3C, MW3D, MW3G, MW3H, MW3K, MW3L, NV4N, NV4O, NV4P, NV5M, NV5N, NV5O, NV5P, NV7B, NV7C, NV7D, NV7E, NV7F, NV7G, NV7H, NV7I, NV7J, NV7K, NV7L, NV7M, NV7N, NV7O, NV7P, NW1A, NW1B, NW1C, NW1D, NW1E, NW1F, NW1G, NW1H,NW1I, NW1J, NW1K, NW1L, MV9D6, MV9D9, MV9E4, MV9E5, MV9E6, MV9E7, MV9E8, MV9E9, MV9F4, MV9F5, MV9F6, MV9F7, MV9F8, MV9F9, MV9G4, MV9G5, MV9G6, MV9G7, MV9G8, MV9G9, MV9H3, MV9H4, MV9H5, MV9H6, MV9H7, MV9H8, MV9H9, MW3B2, MW3B3, MW3B5, MW3B6, MW3B8, MW3B9, MW3F2, MW3F3, MW3F5, MW3F6, MW3F8, MW3F9, MW3J2, MW3J3, MW3O1, MW3O2, MW3O3, MW3P1, MW3P2, MW3P3, NV4I5, NV4I6, NV4I8, NV4I9, NV4J4, NV4J5, NV4J6, NV4J7, NV4J8, NV4J9, NV4K4, NV4K5, NV4K6, NV4K7, NV4K8, NV4K9, NV4L4, NV4L5, NV4L6, NV4L7, NV4L8, NV4L9, NV4M2, NV4M3, NV4M5, NV4M6, NV4M8, NV4M9, NV5I4, NV5I5, NV5I6, NV5I7, NV5I8, NV5I9, NV5J4, NV5J5, NV5J6, NV5J7, NV5J8, NV5J9, NV5K4, NV5K5, NV5K6, NV5K7, NV5K8, NV5K9, NV5L4, NV5L5, NV5L6, NV5L7, NV5L8, NV5L9, NV7A2, NV7A3, NV7A4, NV7A5, NV7A6, NV7A7, NV7A8, NV7A9, NW1M1, NW1M2, NW1M3, NW1N1, NW1N2, NW1N3, NW1O1, NW1O2, NW1O3, NW1P1, NW1P2, NW1P3. |