

COMMONWEALTH OF AUSTRALIA
AUSTRALIAN COMMUNICATIONS AND MEDIA AUTHORITY



Radiocommunications Act 1992

SPECTRUM LICENCE FOR THE 1800 MHz BAND

This licence is issued under Part 3.2 of the *Radiocommunications Act 1992* ('the Act') to the person named at Item 1 of Part 1, Licence Schedule 1 of this licence.

1. The person named at Item 1 of Part 1, Licence Schedule 1 of this licence (the licensee), or a person authorised under subsection 68 (1) of the Act, is authorised, under this licence, to operate radiocommunications devices in accordance with:
 - (a) the Act;
 - (b) the core conditions set out in Licence Schedule 2;
 - (c) the statutory conditions set out in Licence Schedule 3; and
 - (d) the other conditions set out in Licence Schedule 4.

2. This licence comes into force on the date shown at Item 5 of Part 1, Licence Schedule 1 and remains in force until the end of the date shown at Item 6 of Part 1, Licence Schedule 1.

Definitions

3. In this licence, unless the contrary intention appears:

Act means the *Radiocommunications Act 1992*.

area-adjacent licences mean the spectrum licences that authorise the operation of radiocommunications devices in the geographic areas adjacent to the geographic areas described in Part 2 of Licence Schedule 1 of this licence.

frequency-adjacent licences mean the spectrum licences that authorise the operation of radiocommunications devices in the frequency bands adjacent to the frequency bands described in Part 2 of Licence Schedule 1 of this licence.

harmful interference has the same meaning as in the spectrum plan made under subsection 30 (1) of the Act.

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

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

peak power means the average power measured within a specified bandwidth during one radio frequency cycle at the crest of the signal envelope.

rail safety and control communications means voice or data communications using radiofrequency spectrum for the purposes only of rail safety, rail operations or rail control, and includes communications:

- (a) between a train's on-board operating system (or human operator) and a rail operations centre;
- (b) between the on-board operating systems (or human operators) of a train and another train;
- (c) between a train's on-board operating system and track-side devices;
- (d) between rail track workers and a train and/or rail operations centre; and
- (e) of a rail operator advising its passengers of train arrivals or departures, or providing other information relevant to passenger safety.

Note: A number of terms used in this licence, are defined in the Act and have the meanings given to them by the Act, including:

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

Definitions (cont)

4. Unless the contrary intention appears, terms and expressions used in this licence have the meaning given to them by the *Radiocommunications (Unacceptable Levels of Interference - 1800 MHz Band) Determination 2012*.
5. Unless the contrary intention appears, in this licence:
 - (a) the value of a parameter in Licence Schedules 2 and 3 must be estimated with a level of confidence not less than 95% that the true value of the parameter will always remain below the requirement specified; and
 - (b) the range of numbers that identify a frequency band includes the higher, but not the lower, number.

Licence Schedule 1 Licence details, bands and areas

Part 1 Licence Details

<i>Item</i>	<i>Licensee Details</i>	
1	<i>Name of licensee</i>	Queensland Rail Limited
2	<i>Address of licensee</i>	GPO Box 1429 BRISBANE QLD 4001
3	<i>Client number</i>	1149151
	Licence Details	
4	<i>Band release</i>	1800 MHz Band
5	<i>Date of licence effect</i>	4/05/2015
6	<i>Date of licence expiry</i>	17/06/2028
7	<i>Licence number</i>	9367783
8	<i>Date of licence issue</i>	8/08/2014

Part 2 Frequency bands and geographic areas

For core condition 1, this licence authorises the operation of radiocommunications devices in the frequency bands specified in column 3 and within the corresponding geographic areas specified in column 2 of Table 1.

The frequency band consists of the bandwidth between the lower and upper frequencies, where the lower frequency limit is exclusive and upper frequency limit is inclusive. The geographic areas in column 2 of Table 1 are described by the sequence of HCIS identifiers in Table 2.

Licence Schedule 1 Licence details, bands and areas (cont)

Table 1: Frequency bands and geographic areas of this licence

Identifier (column 1)	Geographic areas (column 2)	Frequency bands (column 3)			
		Lower band (MHz)		Upper band (MHz)	
		Lower limit	Upper limit	Lower limit	Upper limit
A	1	1775	1785	1870	1880

Licence Schedule 1 Licence details, bands and areas (cont)

Table 2: Description of the geographic areas of this licence

Geographic areas (column 1)	HCIS identifiers (column 2)
1	NU2C3, NU2D1, NU2D2, NU2D3, NU2D5, NU2D6, NU2D8, NU2D9, NU2H2, NU2H3, NU3A, NU3B, NU3C, NU3D, NU3E1, NU3E2, NU3E3, NU3E5, NU3E6, NU3E8, NU3E9, NU3F, NU3G, NU3H, NU3I2, NU3I3, NU3J1, NU3J2, NU3J3, NU3K1, NU3K2, NU3K3, NU3L1, NU3L2, NU3L3, 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, NU2C1, NU2C2, NT6P4, NT6P5, NT6P6, NT6P7, NT6P8, NT6P9, NT8C, NT8D, NT8G, NT8H, NT8K, NT8L, NT8O, NT8P, NT9

Note: The HCIS is described in the *Australian Spectrum Map Grid 2012*. The *Australian Spectrum Map Grid 2012* is available on the ACMA website at: www.acma.gov.au. Copies are also available from the ACMA.

Frequency band and geographic areas

1. This licence authorises the operation of radiocommunications devices in the frequency bands and within the geographic areas set out at Part 2 of Licence Schedule 1.

Emission limits outside the frequency band

2. Core conditions 3 to 11 apply in relation to those frequencies that are outside the frequency bands set out in Part 2 of Licence Schedule 1.
3. Where a written agreement specifying the maximum permitted level of radio emission for frequencies described in Core Condition 2 exists between:

- (a) the licensee; and
- (b) all the affected licensees of frequency-adjacent and area-adjacent licences;

the licensee must comply with that specified maximum permitted level of radio emission.

4. Where there is no written agreement for the purposes of Core Condition 3 in force, the licensee must comply with Core Conditions 5 to 11.

Non spurious emission limits

5. (1) Subject to sub-condition 5(2), the licensee must ensure that radiocommunications devices operated under the licence do not exceed the non spurious emission limits in Core Conditions 6 and 7.

(2) For any frequency where an emission limit described in Core Condition 8 is less than an emission limit described in Core Condition 6 or 7, the emission limit in Core Condition 8 applies.

6. The non spurious emission limits in Table 3 apply:

- (a) at frequencies outside the 1710-1785 MHz and 1805-1880 MHz frequency bands; and
- (b) offset from 1785 MHz, 1805 MHz and 1880 MHz;

where:

f_{offset} : is the frequency offset from the 1785 MHz, 1805 MHz and 1880 MHz band edges. The centre frequency of the specified bandwidth is placed at f_{offset} .

Table 3: Radiated maximum true mean power non spurious emission limits

Frequency offset range (f_{offset})	Radiated maximum true mean power (dBm EIRP)	Specified Bandwidth
$0 \text{ Hz} \leq f_{\text{offset}} < 200 \text{ kHz}$	2	30 kHz
$200 \text{ kHz} \leq f_{\text{offset}} < 900 \text{ kHz}$	$2 - 15 \times (f_{\text{offset}} \text{ (MHz)} - 0.2)$	30 kHz
$900 \text{ kHz} \leq f_{\text{offset}} < 5.6 \text{ MHz}$	-8.5	30 kHz
$f_{\text{offset}} \geq 5.6 \text{ MHz}$	-18.5	30 kHz

7. The non spurious emission limits in Table 4a and 4b apply:

- (a) at frequencies outside the 1710-1785 MHz frequency band; and
- (b) offset from 1710 MHz;

where:

f_{offset} : is the frequency offset from the 1710 MHz band edge. The centre frequency of the specified bandwidth is placed at f_{offset} .

Table 4a: Radiated maximum true mean power non spurious emission limits

Frequency offset range (f_{offset})	Radiated maximum true mean power (dBm EIRP)	Specified Bandwidth
$0 \text{ Hz} \leq f_{\text{offset}} < 500 \text{ kHz}$	-8.5	30 kHz
$f_{\text{offset}} \geq 500 \text{ kHz}$	-33.5	30 kHz

Table 4b: Radiated peak power non spurious emission limits

Frequency offset range (f_{offset})	Radiated peak power (dBm EIRP)	Specified Bandwidth
$0 \text{ Hz} \leq f_{\text{offset}} < 300 \text{ kHz}$	10	300 kHz

Licence Schedule 2

Core Conditions (cont)

8. The non spurious emission limits in Table 5 apply:
- at frequencies outside the upper or lower frequency limits as set out in Part 2 of Licence Schedule 1; and
 - offset from the upper or lower frequency limits set out in Part 2 of Licence Schedule 1.

where:

f_{offset} : is the frequency offset from the upper or lower frequency limits set out in Part 2 of Licence Schedule 1. The centre frequency of the specified bandwidth is placed at f_{offset} .

Table 5: Radiated maximum true mean power non spurious emission limits

Frequency offset range (f_{offset})	Radiated maximum true mean power (dBm EIRP)	Specified Bandwidth
$0 \text{ Hz} \leq f_{\text{offset}} < 200 \text{ kHz}$	21.5	30 kHz
$200 \text{ kHz} \leq f_{\text{offset}} < 1 \text{ MHz}$	$2 - 13.125 \times (f_{\text{offset}} \text{ (MHz)} - 0.2)$	30 kHz
$1 \text{ MHz} \leq f_{\text{offset}} < 5.8 \text{ MHz}$	-8.5	30 kHz
$f_{\text{offset}} \geq 5.8 \text{ MHz}$	-13	30 kHz

Spurious emission limits

9. The licensee must ensure that radiocommunications devices operated under the licence do not exceed the spurious emission limits in Core Conditions 10 and 11.
10. For radiocommunications transmitters operated under the licence, the spurious emission limits in Table 6 apply at frequencies outside the 1710-1785 MHz and 1805-1880 MHz frequency bands.

Table 6: Radiocommunications transmitter spurious emission limits

Frequency range (f)	Radiated mean power (dBm EIRP)	Specified Bandwidth
$9 \text{ kHz} \leq f < 150 \text{ kHz}$	-36	1 kHz
$150 \text{ kHz} \leq f < 30 \text{ MHz}$	-36	10 kHz
$30 \text{ MHz} \leq f < 1 \text{ GHz}$	-36	100 kHz
$1 \text{ GHz} \leq f < 3.5 \text{ GHz}$	-2	1 MHz
$3.5 \text{ GHz} \leq f < 12.75 \text{ GHz}$	-30	1 MHz

Licence Schedule 2

Core Conditions (cont)

11. For radiocommunications receivers operated under the licence, the spurious emission limits in Table 7 apply at frequencies outside the 1710-1785 MHz and 1805-1880 MHz frequency bands.

Table 7: Radiocommunications receiver spurious emission limits

Frequency range (f)	Radiated mean power (dBm EIRP)	Specified Bandwidth
$9 \text{ kHz} \leq f < 1 \text{ GHz}$	-57	100 kHz
$1 \text{ GHz} \leq f < 3.5 \text{ GHz}$	-19	1 MHz
$3.5 \text{ GHz} \leq f < 12.75 \text{ GHz}$	-47	1 MHz

Emission limits outside the geographic area

12. Core Conditions 13 to 15 apply in relation to those areas that are outside the geographic areas set out in Part 2 of Licence Schedule 1.
13. Where a written agreement specifying the maximum permitted level of radio emission for areas described in Core Condition 12 exists between:
- (a) the licensee; and
 - (b) all the affected licensees of frequency-adjacent licences and area-adjacent licences;
- the licensee must comply with that specified maximum permitted level of radio emission.
14. Where there is no written agreement for the purposes of Core Condition 13 in force, the licensee must comply with Core Condition 15.
15. (1) The licensee must ensure that the maximum permitted level of radio emission for an area described in Core Condition 12 caused by operation of radiocommunications devices under the licence does not exceed a radiated maximum true mean power of 54.5 dBm EIRP per 30 kHz.
- (2) The licensee complies with sub-condition 15(1) by ensuring that no radiocommunications device is operated under the licence in excess of a radiated maximum true mean power of 54.5 dBm EIRP per 30 kHz.

Liability to pay charges

1. The licensee must comply with all its obligations to pay:
 - (a) charges fixed by determinations made under section 60 of the *Australian Communications and Media Authority Act 2005*;
 - (b) the spectrum access charges fixed by determinations made under section 294 of the Act; and
 - (c) amounts of spectrum licence tax.

Third party use

2. (1) The licensee must notify any person whom the licensee authorises, under section 68 of the Act to operate radiocommunications devices under this licence of that person's obligations under the Act, in particular:
 - (a) the registration requirements under Part 3.5 of the Act for operation of radiocommunications devices under the licence (if applicable); and
 - (b) any rules made by the ACMA under subsection 68(3) of the Act.
- (2) Any person other than the licensee who operates a radiocommunications device under this licence must comply with rules made by the ACMA under subsection 68 (3) of the Act.

Radiocommunications transmitter registration requirements

3. The licensee must not operate a radiocommunications transmitter under this licence unless:
 - (a) the radiocommunications transmitter has been exempted from the registration requirements under statutory condition 4 below; or
 - (b) both:
 - (i) the requirements of the ACMA under Part 3.5 of the Act relating to registration of the radiocommunications transmitter have been met; and
 - (ii) the radiocommunications transmitter complies with the details about it that have been entered in the Register.

Exemption from registration requirements

4. The following kinds of radiocommunications transmitters are exempt from the registration requirement in statutory condition 3:
 - (a) a mobile transmitter that operates in the 1800 MHz band with a radiated power of less than or equal to 39 dBm EIRP per occupied bandwidth; or
 - (b) a fixed transmitter that operates in the 1800 MHz band with a radiated power always less than or equal to 33 dBm EIRP per occupied bandwidth.

Residency

5. (1) The licensee must not derive any income, profits or gains from operating radiocommunications devices under this licence, or from authorising an authorised person to do so, unless:
- (a) the licensee is an Australian resident; or
 - (b) the income, profits or gains are attributable to a permanent establishment in Australia through which the licensee carries on business.
- (2) An authorised person must not derive income, profits or gains from operating radiocommunications devices under this licence, or from allowing third parties to operate radiocommunications devices under this licence, unless:
- (a) the authorised person is an Australian resident; or
 - (b) the income, profits or gains are attributable to a permanent establishment in Australia through which the authorised person carries on business.

- (3) In this condition:

Australian resident has the same meaning as in the *Income Tax Assessment Act 1997*.

authorised person means a person authorised under section 68 of the Act by the licensee to operate radiocommunications devices under this licence.

permanent establishment has the same meaning as in:

- (a) if the licensee or authorised person (as appropriate) is a resident of a country or other jurisdiction with which Australia has an agreement within the meaning of the *International Tax Agreements Act 1953*-that agreement; or
- (b) in any other case-the *Income Tax Assessment Act 1997*.

Interference management

1. In this licence Schedule 4:

communal site has the same meaning as in the *Radiocommunications (Interpretation) Determination 2000* as in force from time to time.

managing interference includes but is not limited to:

- (a) investigating the possible causes of the interference;
- (b) taking all steps reasonably necessary to resolve disputes about interference;
- (c) taking steps (or requiring persons authorised to operate devices under this licence to take steps) reasonably likely to reduce interference to acceptable levels; and
- (d) negotiating with other persons to reduce interference to acceptable levels.

Responsibility to manage interference

2. The licensee must manage interference between:

- (a) radiocommunications devices operated under this licence; and
- (b) radiocommunications devices operated under this licence and under each other spectrum licence held by the licensee.

Co-sited devices

3. If:

- (a) interference occurs between a radiocommunications device:
 - (i) operated under this spectrum licence; and
 - (ii) operated under another licencewhen the measured separation between the phase centre of the antenna used with each device is less than 200 metres; and
 - (b) that interference is not the result of operation of a radiocommunications device in a manner that does not comply with the conditions of the relevant licence; and
 - (c) either the licensee or the holder (or third party authorisee) of the other licence wishes to resolve the interference;
- the licensee must manage interference with:
- (d) the holder of the other licence; or
 - (e) if a site manager is responsible for managing interference at that location, that site manager.

Information for register

4. The licensee must give the ACMA all information as required by the ACMA from time to time for inclusion in the Register.

Note: Licensees should assist the ACMA in keeping the Register accurate and up to date by informing the ACMA of changes to device registration details as soon as possible.

International coordination

5. The licensee must ensure that operation of a radiocommunications transmitter under this licence does not cause harmful interference to a radiocommunications receiver that operates in accordance with the ITU Radio Regulations and is located in a country other than Australia.

Electromagnetic Energy (EME) Requirements

6. The licensee must comply with Parts 2, 3 and 4 of the *Radiocommunications Licence Conditions (Apparatus Licence) Determination 2003*, as in force from time to time. For the purpose of compliance with this condition, the definition of licence in subsection 4(1) of the *Radiocommunications Licence Conditions (Apparatus Licence) Determination 2003* should be read as if it means a spectrum licence.

Record Keeping - transmitters located at communal sites

7. (1) If the licensee operates a radiocommunications transmitter under the licence, and the transmitter:
 - (a) is located at a communal site; and
 - (b) is not exempt under Statutory Condition 4 of Licence Schedule 3,

the licensee must comply with sub-conditions 7(2) and 7(3).

7. (2) In relation to each transmitter, the licensee must keep a record which includes the following information:
- (a) the transmitter's device registration number as specified in the Register;
 - (b) the licence number of the licence;
 - (c) the transmitter's geographic location;
 - (d) if the licensee owns the transmitter, the licensee's name and address;
 - (e) if the licensee does not own the transmitter, the owner's name and address;
 - (f) the transmitter's centre frequency;
 - (g) the transmitter's emission designator;
 - (h) details of the transmitter's antenna including the manufacturer, model, type, gain, polarisation, azimuth and average ground height;
 - (i) the transmitter's maximum true mean power; and
 - (j) the transmitter's maximum EIRP.
- (3) If the ACMA requests a copy of a record kept under sub-condition 7(2), the licensee must comply with the request as soon as practicable.

Scope of licence

8. This licence only authorises the operation of radiocommunications devices for the purpose of the provision of rail safety and control communications.

Variation to licence conditions

1. The ACMA may, with the written agreement of the licensee, vary a licence by including one or more further conditions, or revoking or varying any conditions of the licence, provided that the conditions, as varied, still comply with the requirements of Subdivision C of Division 1 of Part 3.2 of the Act.
2. The ACMA may, by written notice given to the licensee, vary a licence by including one or more further conditions or revoking or varying any non core conditions of the licence provided that the licence as varied complies with the requirements of Subdivision C of Division 1 of Part 3.2 of the Act.

Determination of Unacceptable Interference

3. The ACMA has made the *Radiocommunications (Unacceptable Levels of Interference - 1800 MHz Band) Determination 2012* that sets out the unacceptable levels of interference for the purpose of registering radiocommunications transmitters to be operated under this licence, and which is to be used for the issuing of certificates by accredited persons under subsection 145(3) of the Act.

Note: Although not mandatory, the registration of radiocommunications receivers to be operated under the licence is advised because one of the matters ACMA will take into account in settling interference is the time of registration of the receiver involved in the interference.

Guidelines

4. The ACMA has issued written Radiocommunications Advisory Guidelines (the *guidelines*) under section 262 of the Act about:
 - (a) co-ordinating the operation of radiocommunications transmitters under this licence with radiocommunications receivers operated under other licences
 - *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters - 1800 MHz Band) 2012*;
 - (b) co-ordinating the operation of radiocommunications receivers operated under this licence with radiocommunications transmitters operated under other licences:
 - *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licence Receivers - 1800 MHz Band) 2012*;
 - (c) co-ordinating the operation of high sited radiocommunications transmitters operated under this licence with radiocommunications receivers in the 1800 MHz lower band operated under other licences:
 - *Radiocommunications Advisory Guidelines (Additional Device Boundary Criteria - 1800 MHz Lower Band) 2012*.
5. The guidelines should be read in conjunction with the *Radiocommunications (Unacceptable Levels of Interference - 1800 MHz Band) Determination 2012* (see Licence Note 3). Licensees (and accredited persons) should follow the guidelines before operating radiocommunications transmitters under this licence.

Licence Schedule 5

Licence Notes (cont)

The ACMA intends to afford protection to radiocommunications receivers in accordance with the guidelines in the settlement of interference disputes.

Suspension and cancellation of spectrum licences

6. The ACMA may by written notice given to a licensee, suspend or cancel a spectrum licence in accordance with Division 3 of Part 3.2 of the Act.

Re-issue

7. A spectrum licence will not be re-issued to the same licensee without a price based allocation procedure unless:
 - (a) the licence was used to provide a service of a kind determined by the Minister under subsection 82 (3) of the Act for which re-issuing licences to the same licensees would be in the public interest; or
 - (b) the ACMA is satisfied under paragraph 82 (1) (b) of the Act that special circumstances exist as a result of which it would be in the public interest for that licensee to continue to hold that licence.

Trading

8. (1) A licensee may assign or otherwise deal with the whole or any part of a spectrum licence provided that this is done in accordance with any rules determined by the ACMA under section 88 of the Act.
 - (2) An assignment under section 85 of the Act of the whole or any part of a licence that involves any change to a licence does not take effect until the Register in respect of spectrum licences has been amended to take it into account.

Appeals

9. An application may be made to the ACMA for re-consideration of the ACMA's decisions listed in section 285 of the Act. A person affected by and dissatisfied with an ACMA decision may seek a re-consideration of the decision by the ACMA under subsection 288(1) of the Act. This decision can be subject to further re-consideration by the Administrative Appeals Tribunal, subject to the provisions of the *Administrative Appeals Tribunal Act 1975*.

Labelling of transmitters

10. Licensees should affix identification labels containing the name and address of the licensee on all fixed transmitters operated under this licence.

Note: An example of an identification label would be one containing the following statement:
"This device is the property of 'name'".

Indicative Graphic Representation of Geographical Area 1



The area shaded in red is only an indicative graphical representation of Geographical Area 1. Refer to the HCIS identifiers specified in part 2 of licence schedule 1 of the licence for a detailed description of the area.