

EME MEASUREMENT REPORT

Site: **NPC MEDIA BUILDING**

Address: **12 Rodborough Rd, Frenchs Forest**

ACMA Site ID: **9000736**

EME Survey Date: **22nd January 2021**

Report Number: **EME-MR-2021001**

Report Date: **9 February 2021**

Report Version: **R1**



Accredited for compliance with ISO/IEC 17025 - Testing

The results of the tests and measurements included in this document are traceable to Australian/National standards. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

Accreditation Number: **15036**



Report Title	EME MEASUREMENT REPORT
Report Number	EME-MR-2021001
Report Issue Date	9 February 2021
Report Version	R1 - This revision replaces all previously issued versions of this report.
Revision History	R1 - First Authorised Issue
Report Author	Brett Moule
Report Distribution	1. Kordia Master Copy - Kordia Intranet (electronic) 2. Clients Master Copy - Clients Intranet (electronic)
Site Name / Site No	NPC MEDIA - 9000736
EME Survey Date	22nd January 2021
Site EME Surveyor	Brett Moule
Client Details	Igor Vieira TX Australia 7 Eden Park Drive, Macquarie Park 2113 Phone: 0434-077 883 Email: IVieira@txaustralia.com.au
Authorised Signatory	Brett Moule Principal EMF Consultant  9/02/2021
	KORDIA SOLUTIONS PTY LTD ABN: 80 002 649 229 L9, 5 RIDER BLVD, RHODES 2138, NSW AUSTRALIA P. +61 2 9856 2339. M. +61 417 671 200. E. Brett.moule@kordia.com.au W. www.kordia.com.au
This document shall not be reproduced except in full. While all reasonable care has been exercised by Kordia in preparing this document, the EME measurements reported are those observed on the day of the survey. If requested, Kordia is able to provide specific interpretations of these results. Kordia will not be liable in any event for any damages, losses, costs or expenses or injury of any kind which arises from the information contained in this document. Any individual working on or near Radio Frequency Emitting structures should ensure that they understand this report and limit self-exposure to allowable limits specified in the appropriate standards and regulations current at the time. The Kordia® name, logo, circle device in "Kordia" and strap line "People and technology as one" are all registered trademarks of Kordia Group Limited and may not be used or reproduced without prior written permission of Kordia.	



Table of Contents

1.	INTRODUCTION.....	4
2.	EXECUTIVE SUMMARY	4
3.	DEFINITIONS AND ACRONYMS	5
4.	SITE IDENTIFICATION	6
5.	RF SOURCES ONSITE.....	6
6.	SITE PHOTOS.....	7
7.	EME SURVEY RESULTS.....	9
7.1	Measurement locations	9
7.2	EME Measurements at readily accessible areas.....	10
7.3	Compliance boundary locations	10
8.	DETERMINATION OF COMPLIANCE	11
8.1	Details of site configuration	11
8.2	Details of access restrictions and signage	11
9.	GENERIC EME SAFETY PROCEDURES.....	12
10.	TEST EQUIPMENT	13
10.1	Details of EME test equipment.....	13
10.2	Details of other test equipment	13
10.3	Environmental Conditions	13
10.4	Uncertainty estimates.....	13
11.	EME ASSESSMENT APPROACH.....	14
11.1	Applicable EME reference levels.....	14
11.2	EME assessment methodology.....	14
11.3	Compliance with EME regulations and standards	14
12.	STATEMENT OF CONFORMITY.....	15
13.	INTERPRETATION OF EME DRAWINGS	16
14.	EME DRAWINGS.....	17



1. INTRODUCTION

This document contains information and procedures for controlling the risk of established hazards (heating and electro stimulation) associated with *general public* and *occupational* exposure to radiofrequency Electro-Magnetic Energy (EME) at this site.

It should be viewed by anyone with an interest in EME safety at this site including site owners, managers, their associates, contractors and staff. In particular, occupationally exposed workers on this site must familiarise themselves with the entire contents of this document before commencing work on the site, and must adhere to the EME safety procedures prescribed in this document.

This EME Measurement Report is limited to areas that are reasonably accessible.

This document contains information on:

- The contact details for the manager of this site;
- A description of RF sources on this site;
- A description of the methodology and EME safety standards used to assess this site;
- EME safety procedures for this site;
- Description of existing EME access restrictions and signage for this site;
- Drawings which indicate areas on the site which have restricted levels of access according to potential EME hazards.

2. EXECUTIVE SUMMARY

On the 22nd January 2021, Kordia Solutions Pty Ltd conducted an EME Survey at the NPC MEDIA - 9000736, located at 12 Rodborough Rd, Frenchs Forest.

The EME measurements were performed by a qualified measurer using calibrated EME measurement equipment.

This EME Measurement survey only documented the RF EME levels present on the day of the survey.

This EME Measurement survey were taken on the readily accessible areas of the rooftop, including to the top of the 15m mast

All measurements taken at readily accessible locations were found to be well below the *general public reference level*¹. The maximum measurement taken at areas readily accessible was only 0.15% of the general public reference level. This measurement was taken at the top of the 15m mast. Refer to Section 7 for more details.

¹ General Public Reference Level as specified by the ARPANSA RPS3 Radiation Protection Standard: Maximum Exposure Level to Radiofrequency Fields – 3kHz to 300GHz, May 2002.

3. DEFINITIONS AND ACRONYMS

Controlled Area	A controlled area is an area or place in which exposure to RF fields may reasonably be expected to exceed general public limits, and with the following characteristics: (a) The area must be under the supervision of a competent person who must ensure that exposures cannot exceed occupational levels; (b) The area may only be entered by persons who are made aware that they are doing so, and of the need for RF safety; (c) There must be documentation or signage to clearly indicate: (i) areas above occupational limits; (ii) areas above general public limits.
EME	Electromagnetic Energy The energy stored in an electromagnetic field.
E Field	Electric field strength. – For frequencies below 10 MHz, indicated in units of V/m; – For frequencies above 10 MHz, indicated in the equivalent plane wave power flux density units of W/m².
H field	Magnetic field strength. – For frequencies below 10 MHz, indicated in units of A/m; – For frequencies above 10 MHz, indicated in the equivalent plane wave power flux density units of W/m².
HF	High Frequency – 3 MHz to 30 MHz. In radio broadcasting, this frequency band is used by HF radio services
MF	Medium Frequency – 300 kHz to 3 MHz. In radio broadcasting, this frequency band is used by AM radio services.
RF	Radiofrequency Electromagnetic energy with frequencies in the range 3 kHz to 300 GHz.
RF survey meter	An RF survey instrument for measuring ambient E or H fields.
RF personal monitor	An RF field monitoring device carried on a person that is designed to alert the user when ambient field exposures exceed allowable limits.
RF worker	A person who may be exposed to RF fields under controlled conditions, in the course of and intrinsic to the nature of their work. Such persons are subject to the requirements of Section 5.1 in the ARPANSA RPS3 Standard.
UHF	Ultra High Frequency – 300 MHz to 3 GHz. This frequency band is used by UHF TV and mobile telephony services.
VHF	Very High Frequency – 30 MHz to 300 MHz. This frequency band is used by FM radio and VHF TV services.

4. SITE IDENTIFICATION

Site Name	NPC MEDIA
ACMA Site ID	9000736
Site Address	12 Rodborough Rd, Frenchs Forest 2086
Site Co-ordinates	-33.75361154226008, 151.24694794611105
Structures onsite	15m mast on building rooftop.
Adjacent Structures	nil
Site Manager	C/O Security Office NPC Media Ground Floor 12 Rodborough Rd, Frenchs Forest

5. RF SOURCES ONSITE

Ant. No.	Antenna Location	Antenna Height	Antenna Bearing ¹	Antenna Type	Service / System	Frequency	TX Power ²
1	Mast top	15m	235°T	1m Solid Link Dish Commscope VHLPX3-18	Link to Artarmon Tower	18.4GHz	1W
2	SE cnr	3m	216°T	1.2m Solid Link Dish Commscope VHLPX4-18	Link to Willoughby Tower	18.6GHz	0.04W
3	NE cnr	3m	~26°T	7.5m Satellite Dish	Satellite Link	?	?
4	NE cnr	-1m	~183°T	6 element Yagi inside fibreglass radome	UHF Link	~850MHz	?
5	NW cnr	-3m	~12°T	0.9m Satellite Dish	Satellite Link	?	?
6	W face	0m	~208°T	16 element dual band VHF/UHF Yagi	Off air TV Receive?	VHF/UHF	Rx?
7	W face	0m	~202°T	16 element UHF Yagi	UHF Link	~850MHz	?

¹ 'M' indicates bearing relative to Magnetic North, 'T' indicates bearing relative to True North

² Maximum transmitter output power expected during normal operation

6. SITE PHOTOS

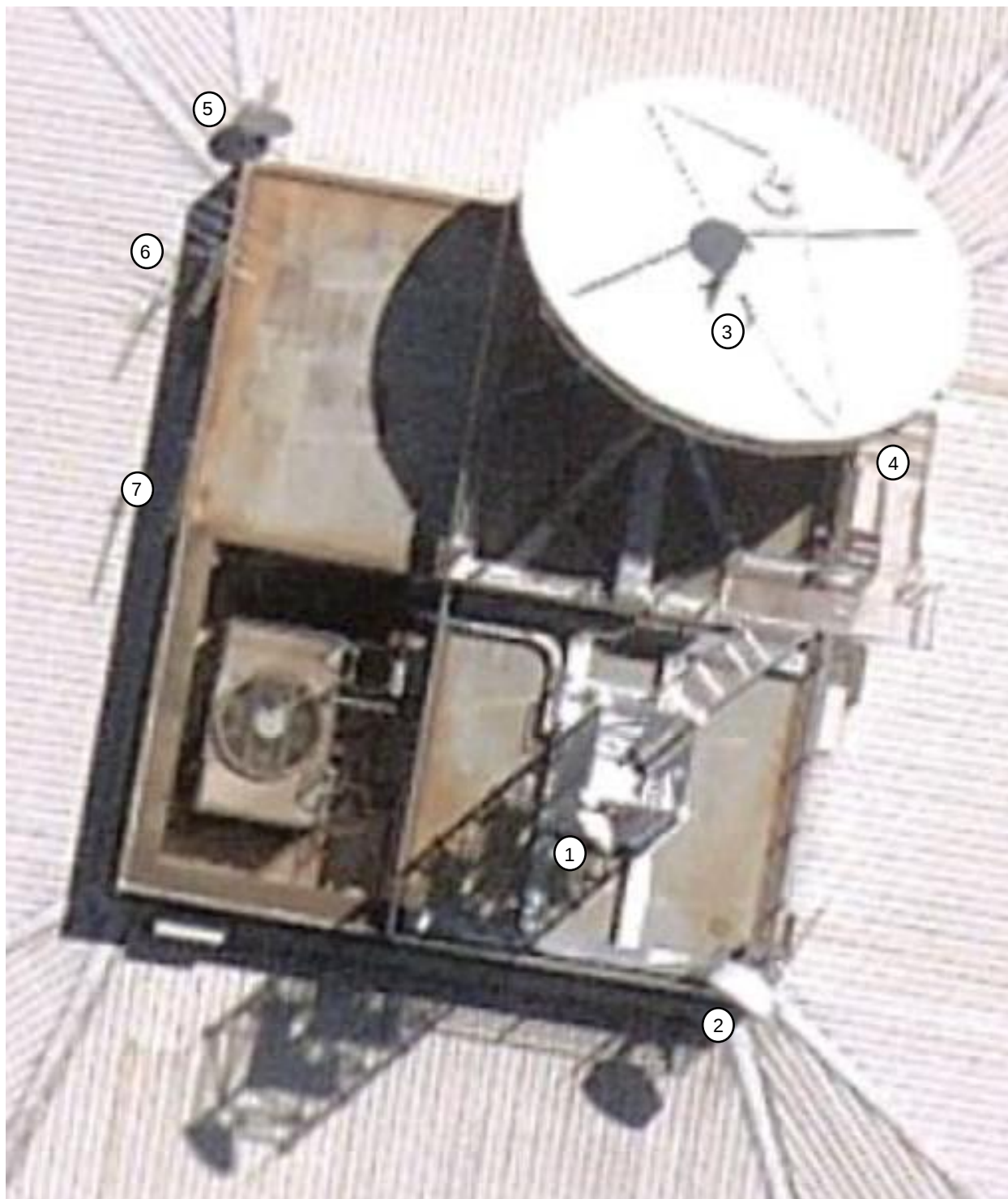


Figure 1 – Antenna locations

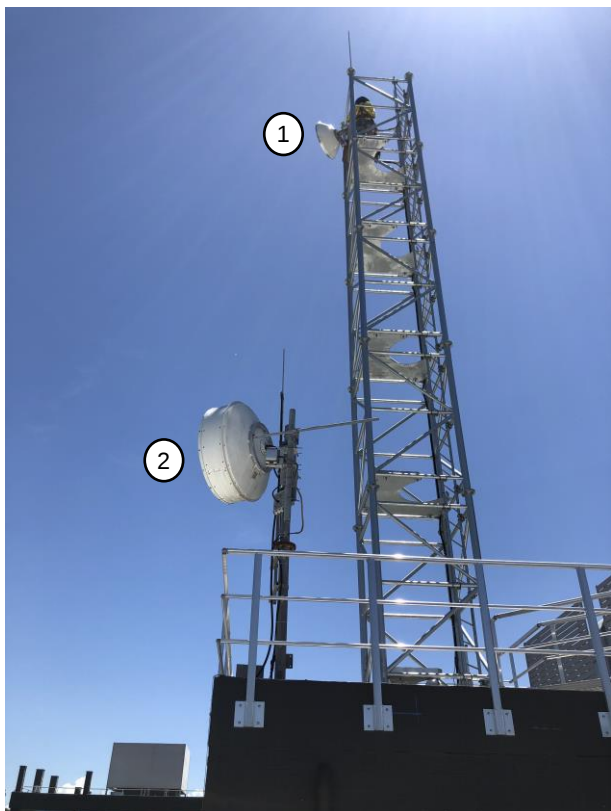


Figure 2 – Antennas 1 and 2

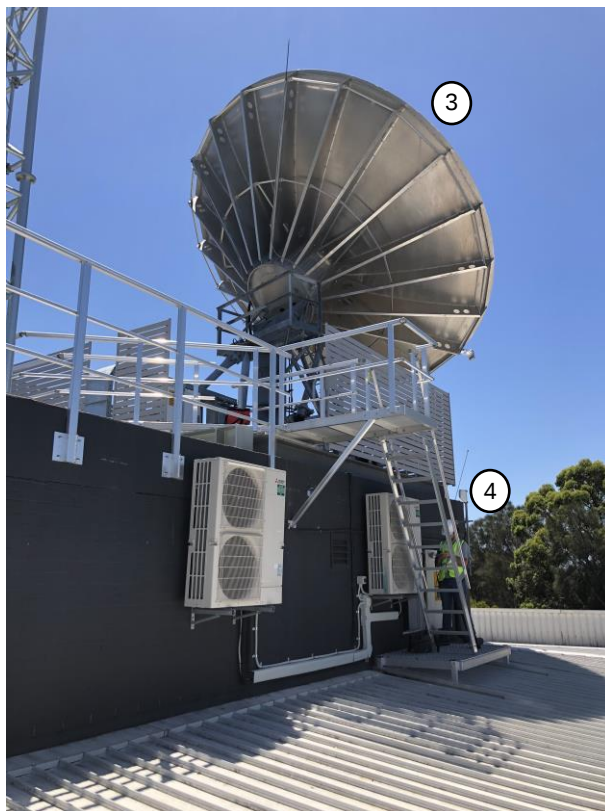


Figure 3 – Antennas 3 and 4



Figure 4 – Antenna 5



Figure 5 – Antennas 6 and 7

7. EME SURVEY RESULTS

7.1 Measurement locations

EME Measurements were performed in the following locations:

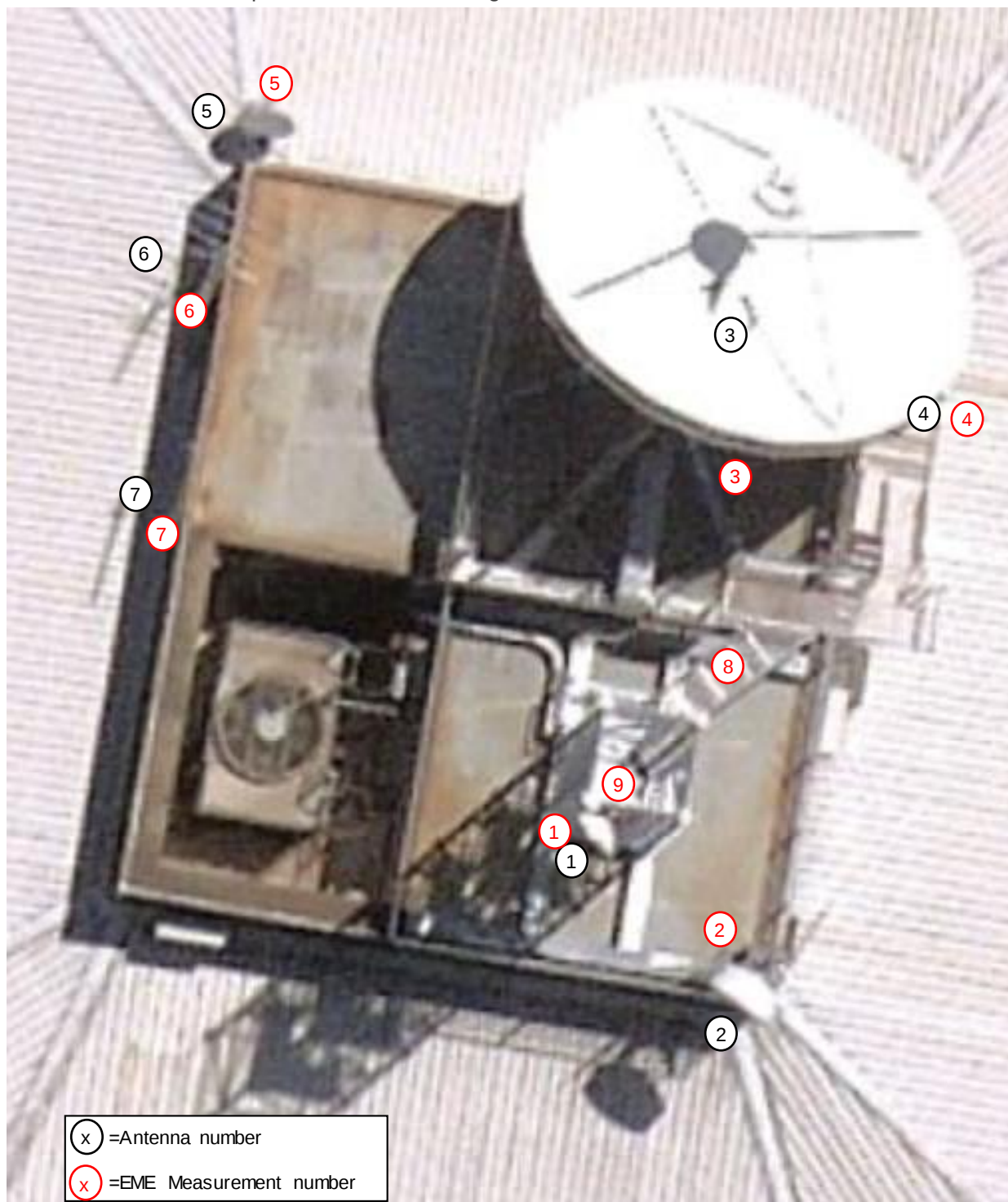


Figure 6 – antenna and measurement locations

7.2 EME Measurements at readily accessible areas

The level and location of the best estimate of the maximum EME exposure in areas reasonably accessible by maintenance staff is summarised below. These levels are then compared to the general public reference levels of the ARPANSA RPS3 standard. All measurements are spatial peak.

#	Measurement Location	E Field Level (W/m ²) ²	% of ARPANSA General Public reference level ³
1	100mm in front of antenna 1 (1m Dish on mast)	1.000	50.00%
2	On roof top behind antenna 2 (1.2m dish)	0.001	0.05%
3	On platform in the area underneath antenna 3 (7.5m Sat Dish)	0.001	0.05%
4	On lower roof near antenna 4 (Yagi in radome)	0.001	0.05%
5	On lower roof in front of antenna 5 (0.9m sat dish)	0.001	0.05%
6	On lower roof near antenna 6 (VHF/UHF Yagi)	0.001	0.05%
7	On lower roof near antenna 7 (UHF link Yagi)	0.001	0.05%
8	On new steel platform walkway North East of mast	0.001	0.05%
9	On top of 15m mast, behind antenna 1.	0.003	0.15%

7.3 Compliance boundary locations

The locations of the ARPANSA RPS3 General Public and Occupational Compliance Boundaries are summarised below. Measurements were only taken at areas that are reasonably accessible by the public and/or maintenance staff at this site.

All distances to Compliance Boundaries shown in this report are measured as distance from the extremity of the antenna/equipment (not to the centre). Accuracy of measurements is +/- 10cm.

Location	General Public Compliance Boundary	Occupational Compliance Boundary
Readily accessible areas on the rooftop and mast	Not exceeded	Not exceeded

² The results that are less than 0.001 W/m² (0.6V/m) are below the sensitivity of the measuring equipment and are marked BDL.

³ The highest E field reading in each location was used to calculate the % of the General Public reference level at 100 MHz. The percentage values indicated have been calculated as equivalent plane wave power flux density.

8. DETERMINATION OF COMPLIANCE

8.1 Details of site configuration

This assessment is limited to those transmitters and site configurations listed in Section 5 of this report.

The structure layout, dimensions and antenna positions were gathered from an onsite audit:

Detailed information on the antenna/transmitter operating values were gathered from customer supplied information and the ACMA licensing database.

Details for Access Control and RF signage were gathered from an onsite audit.

Transmitter information provided by the customer and ACMA could affect the validity of results.

8.2 Details of access restrictions and signage

Access to areas within the General Public Compliance Boundary is restricted by a locked door to the rooftop.

“RF EME” warning signs are attached to the locked door to the rooftop.



Figure 7 – Access restriction and EME Warning Sign

9. GENERIC EME SAFETY PROCEDURES

The following are generic EME safety procedures for this type of broadcast site:

1. If any of the EME safety procedures specified are breached, or if there is a suspected EME over-exposure, then the site manager should be notified immediately.
2. Confirm that the transmitter information contained within this report is current for all services on site before commencing any work. Incomplete or inaccurate transmitter information may invalidate the EME assessments provided in this document. In this case, consult with the site manager before proceeding.
3. Access restrictions shown in the site EME drawings or indicated by signage on the site must be observed unless otherwise permitted in the EME safety procedures.
4. Personnel must identify all relevant transmit equipment (antennas, transmitters, switch frames etc) before commencing any work.
5. Calibrated Personal RF Monitors that simultaneously measure E and H Fields must be worn at all times when accessing the transmit structure to verify safe working conditions.
6. No work is permitted in front of live high gain antennas.
7. If any power reduction or antenna switching is required to allow safe access to a designated area, then the switching technician must confirm the power reduction and/or switch is complete before climbers may proceed. The switching technician must then confirm that all climbers have moved to a safe area before the re-activation of the service.

10. TEST EQUIPMENT

10.1 Details of EME test equipment

The calibration of the EME measurement equipment used in this report has been carried out by an independent laboratory accredited by a National Metrology institute that is a signatory of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA).

Equipment type	Serial No.	Calibration Due Date	Post Survey Validation Date
Wandel & Goltermann – EMR 300 meter	F-0047	28/1/2022	4/2/2021
Wandel & Goltermann – Type 9 Probe Isotropic E Field (3MHz – 18GHz)	O-0002	28/1/2022	4/2/2021

The post validation of the RF survey equipment was performed using a transverse electromagnetic (TEM) cell located in the Kordia Solutions EME laboratory at Level 9, 5 Rider Blvd, Rhodes 2138 NSW, Australia.

10.2 Details of other test equipment

Other equipment used during the survey are listed below.

Equipment type	Serial No.
Bosch PLR50 Laser Rangefinder	301836681
RS1360 Temperature/Humidity Meter	030810530

10.3 Environmental Conditions

Temperature and humidity during the EME measurements (as measured by Kordia) was.

Time of measurements	Temperature Range	Humidity Range
1pm – 1:45pm	30.8 – 31.6°C ($\pm 1^{\circ}\text{C}$)	42 - 44% RH ($\pm 5\%$ RH)

10.4 Uncertainty estimates

Expanded uncertainty estimates for measurement situations encountered by Kordia technicians using the test equipment specified has been calculated for a range of probe combinations and measurement scenarios. For all examined circumstances, the expanded uncertainty is less than 3 dB for a coverage factor of 2. Assuming a normal distribution for all combined uncertainties, this expanded uncertainty estimate spans a 95% confidence interval.

11. EME ASSESSMENT APPROACH

11.1 Applicable EME reference levels

REFERENCE LEVELS FOR EQUIVALENT PLANE WAVE POWER FLUX DENSITY (> 10MHz)			
Applicable Frequency (MHz)	Reference level	General Public Level	Occupational Level
10 - 400	E & H Field – Time Averaged	2 W/m ²	10 W/m ²
	E & H Field – Instantaneous	2,000 W/m ²	10,000 W/m ²

Transmitters operating above 400 MHz at this site were surveyed according to the most stringent ARPANSA reference levels applicable (frequencies 10-400MHz).

11.2 EME assessment methodology

The EME measurements on this site were conducted with all transmitter output power levels set to those indicated in section 5. The transmitters were confirmed as operating at the indicated power levels before and after the RF hazard measurements.

Time averaged E field exposures at this site were assessed by direct measurement. H field levels are inferred from E field measurements. The duty cycles of the RF sources on this site ensure that compliance with the time averaged E & H reference levels also implies compliance with the instantaneous E & H reference levels.

The RF hazard survey measurements at this site were performed in accordance with Australian/New Zealand Standard AS/NZS 2772.2:2016 Radiofrequency fields, Part 2: Principles and methods of measurement and computation—3 kHz to 300 GHz (available from www.standards.org.au), and as per the Kordia Solutions RF Assessment Quality Manual (P-EME-001).

Time averaged, Spatial Peak measurements were performed and compared to the time averaged reference levels specified in Table 7 of the ARPANSA RPS3 standard (as per section 4.2 of AS/NZS 2772.2).

Neither Spatial Averaging or extrapolation (or scaling) of measurements was not carried out at this site.

11.3 Compliance with EME regulations and standards

This site has been assessed for compliance with the general public and occupational reference levels (except contact and limb currents) detailed in the Radiation Protection Standard - Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz, May 2002 (RPS3) of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). This standard is available from: www.arpansa.gov.au/pubs/rps/rps3.pdf

Compliance with the radiofrequency (RF) field exposure limits prescribed in the Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015 of the Australian Communications and Media Authority (ACMA) is automatically ensured by compliance with the ARPANSA E & H general public exposure reference levels. This determination is available from: www.acma.gov.au

12. STATEMENT OF CONFORMITY

NPC MEDIA – ACMA SITE ID: 9000736

Issued in accordance with the Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015.

RF Human Exposure Limits

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) has produced a standard for exposure to Radio Frequency (RF) transmissions – ARPANSA Radiation Protection Standard 2002 Maximum Exposure Levels to Radio Frequency Fields – 3 kHz to 300 GHz (RPS3).

The Australian Communications and Media Authority (ACMA) has made the Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015 that requires that the general public is not exposed to RF transmission levels exceeding the general public limits specified in the ARPANSA Standard (RPS3).

State and Commonwealth Occupational Health & Safety laws require compliance with the limits and obligations set out in the ARPANSA standard (RPS3).

Other Radio Frequency Transmitting Equipment

All identified radio communications services are included in the related compliance statement below.

Access Controls, and RF Warning Signs and Safe Work Procedures

Access Controls and RF warning signs as detailed in section 8 of this document were in place at the time of inspection.

Compliance Statement

All RF services identified in section 5 of the this document, operating from this site has been assessed and found to comply with the RF Human Exposure Limits as specified by the ACMA Licence Condition Determination and requirements of the ARPANSA Standard RPS3.

The decision rule as defined in Section 6.3 of AS/NZS 2772.2:2016 has been applied.

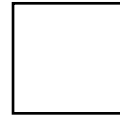
	Accredited for compliance with ISO/IEC 17025-Testing	Approved Signatory:	
	The results of the tests, and measurements included in this document are traceable to Australian/national standards.	Name:	Brett Moule
		Signature:	
		Company:	Kordia Solutions Pty Ltd
		Designation:	Principal EMF Consultant
Accreditation No. 15036		Survey Date:	22nd January 2021

13. INTERPRETATION OF EME DRAWINGS

The EME Measurement drawing(s) show areas on this site where general public and occupational EME exposures may exceed the reference levels stipulated in the ARPANSA RPS3 standard. These areas are designated with different colour markings according to the level of EME exposure:

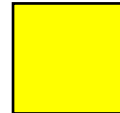
1. Unrestricted Access – General Public Access (No shading)

These are areas where RF exposures do not exceed the ARPANSA RPS3 general public reference levels. These areas may be entered by members of the general public.



2. Occupational Area – RF Workers only (Yellow shading)

These are areas where RF exposures may exceed the ARPANSA RPS3 general public reference levels, but not exceed the occupational reference levels. These areas may only be entered under the following circumstances:



- a. if the entrant is an RF worker; **or**
- b. if the area is being managed as a controlled area; **or**
- c. if the relevant RF exposure source has been switched off, or down powered to a level that permits general public exposures in these areas.

3. No Access area (Red shading)

These are areas where RF exposures may exceed the ARPANSA RPS3 occupational reference levels; or are within close proximity of a significant RF shock or burn hazard. These areas may not be entered by any person unless the relevant exposure source has been switched off, or down powered to a level that permits occupational or general public exposures in these areas.



14. EME DRAWINGS

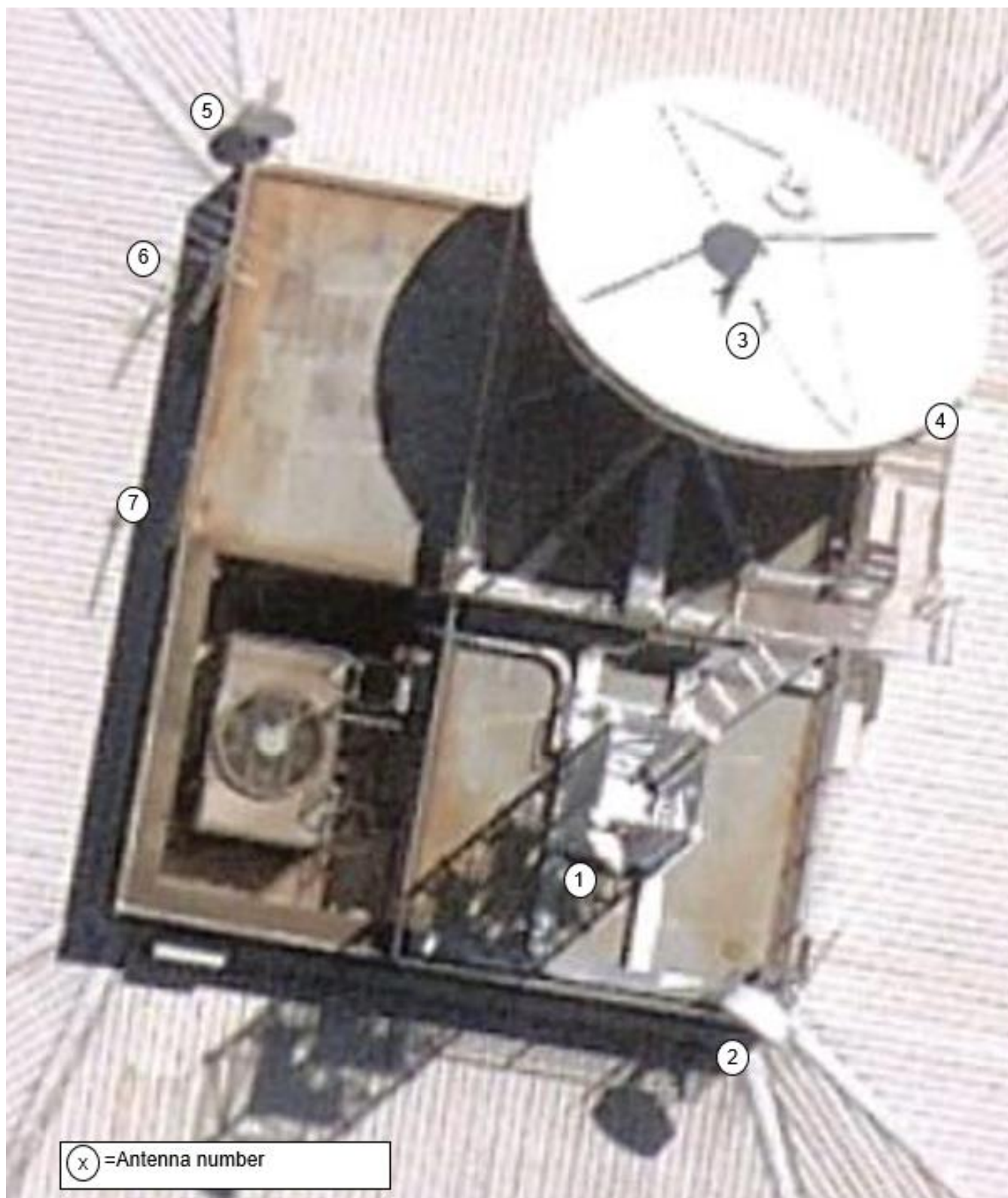
Persons viewing this document should ensure all drawings indicated here are present and viewed in full, rather than one in isolation.

Drawing number	Drawing Title
1 of 1	Station normal

NOTES THAT MUST BE READ IN CONJUNCTION WITH DRAWINGS

1. EME measurements are limited to areas that are reasonably accessible.
2. No access in front of transmitting antennas.
3. Power flux density as measured by an E-field probe is abbreviated to "E", with results in W/m^2 .
4. Power flux density as measured by an H-field probe is abbreviated to "H", with results in W/m^2 .



DRAWING 1 of 1.**STATION NORMAL****NOTE: THERE WERE NO AREAS MEASURED ABOVE GENERAL PUBLIC REFERENCE LEVELS** - Areas above RPS3 General Public Limits. - Areas above RPS3 Occupational Limits.