



LAHC 2022/521 - BUNNERONG RD & ANDERSON STREET, KINGSFORD EMF REPORT

1 INTRODUCTION

Webb Australia Group has been engaged to provide engineering services including, Flood and Stormwater, ESD and Sustainability, Acoustic and Electromagnetic Field (EMF).

This report has been prepared to provide an EMF Impact Assessment and Safety Assessment report for the Planning Proposal Submission.

The perceived need for this assessment and report is highlighted by the presence of Ausgrid's Kingsford Zone Substation adjacent to two boundaries and underground cables associated with the substation adjacent to all boundaries of the site.

The existing overhead Low Voltage Consumers Mains which shall be demolished along with the existing apartment buildings are considered to make only a small contribution to the existing EMF at the site (especially when compared to the underground cables associated with the zone substation).

The new development shall require an electrical substation sized and located to best suit the development layout and power density in accordance with Ausgrid's requirements. The design of the substation and electrical reticulation within the site shall be developed to keep EMF levels below acceptable levels.

There is an existing Zone Substation adjacent to the development and the power supply for the development shall be readily available.

Communications services to the development shall be via NBN Co. optical fibre cable and shall not contribute any EMF.

2 ACCEPTABLE LIMITS

The majority of EMF experienced at the site will be due to the 50Hz electricity installations on and surrounding the site. This power-frequency EMF is also known as extremely low frequency (ELF EMF).

Research on power frequency EMF and health has been conducted since the 1970's. The peak national body representing gas distribution and electricity transmission and distribution throughout Australia is the Energy Networks Association (ENA). The ENA have concluded that no adverse health effects have been established from exposure to EMF below the recognised international guidelines.

The World Health Organization recognizes the two following guidelines:

- International Commission on Non Ionizing Radiation Protection (ICNIRP) – Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields (1Hz to 100kHz).
- IEEE International Committee on Electromagnetic Safety – Health Physics 99(6):818-836 and Standard C95.6.

2.1 MAGNETIC FLUX DENSITY LIMITS

The acceptable Reference Levels for low frequency fields for continuous exposure are summarized as follows:

	IEEE 2002	ICNIRP 2010	World Health Organization (WHO) (Australian limits)
GENERAL PUBLIC			
Exposure general	Not specified	200 μ T (2000mG)	100 μ T (1000mG)
Exposure to head and torso	904 μ T	Not specified	Not specified
Exposure to arms and legs	75,800 μ T	Not specified	Not specified
OCCUPATIONAL			
Exposure general	Not specified	1,000 μ T	500 μ T
Exposure to head and torso	2,710 μ T	Not specified	Not specified
Exposure to arms and legs	75,800 μ T	Not specified	25,000 μ T

Because this site is to be multi-residential use we shall adopt the lowest General Public Reference Level (by WHO) of 100 μ T (1000mG) as the maximum allowable level.

2.2 ELECTRIC FIELD LIMITS

The majority of Electric field experienced at the site will be due to the 50Hz electricity installations on and surrounding the site. This power-frequency EMF is also known as extremely low frequency (ELF EMF).

The acceptable Reference Levels for low frequency Electric Fields for continuous exposure are summarized as follows:

	World Health Organization (WHO) (Australian limits)
GENERAL PUBLIC	
Exposure general	5 kV/m
OCCUPATIONAL	
Exposure general	Not Specified for Australia (25kV/m in some countries)

2.3 RF STRENGTH LIMITS

The acceptable Reference Levels for Radio Frequency Electromagnetic Fields for continuous exposure are summarized as follows:

	World Health Organization (WHO) (Australian limits)	
GENERAL PUBLIC		
	900 MHz	1800 MHz
Exposure general	4.5 W/m ²	9 W/m ²
OCCUPATIONAL		
Exposure general	22.5 W/m ²	45 W/m ²

Because this site is to be multi-residential use we shall adopt the lowest General Public Reference Level (by WHO) of 4.5 W/m² at 900 MHz and 9 W/m² at 1800 MHz as the maximum allowable levels.

3 SITE ASSESSMENT

EMF readings were taken at selected positions on the site using a ISO-TECH IEMF-190 portable triple axis Multi-Field EMF meter commencing at approximately 11:00 on 28/02/2023. Readings for Electric Field and RF Strength were done simultaneously (meter takes simultaneous readings).

The results are shown as tabulated and referenced on the site plan below.

EMF Readings/Location	Magnetic Field (μ T)	Electric Field (V/m)	RF Strength (μ W/m ²)
(Refer to Plan below)			
1	0.25	2	29.9
2	0.17	5	53.2
3	0.162	2	29.9
4	0.18	2	35.1
5	0.34	2	40.7
6	0.28	2	35.1
7	0.20	5	25.1
8	0.07	2	13.3
9	0.11	2	10.2
10	0.19	5	10.2
11	0.72	5	349.2
12	0.54	2	254.5
13	0.21	2	7.48
14	0.33	2	7.48
15	0.49	2	46.7
16	0.28	2	212.7
17	0.24	5	2119
18	0.15	5	129.8
19	0.07	5	205.2
20	0.12	2	20.8
21	0.04	7	10.2
22	0.13	2	651.4
23	0.13	2	989.0

Table No. 1



EMF Readings Plan

3.1 MAGNETIC FIELD

The Magnetic Field readings varied from 0.04 to 0.72 μT and are as shown in Table No. 1.

These values show the area to be safe from an Electric Field perspective (readings were approximately 700 times less than the reference values).

3.2 ELECTRIC FIELD

The Electric Field readings varied from 2 to 7 V/m and are as shown in Table No. 1.

These values show the area to be safe from an Electric Field perspective. (readings were approximately 15 times less than the reference values).

3.3 RF STRENGTH

The RF Strength readings exhibited large variation as a result of bursts of RF energy from transmission sources in the area. The values varied from less than 10 $\mu\text{W}/\text{m}^2$ to peaks above 900 $\mu\text{W}/\text{m}^2$. (Recorded values were readings at a point in time and are as shown in Table No. 1).

These values show the area to be safe from an RF Strength perspective. (readings were approximately 500 times less than the reference values).

4 RECOMMENDATION

Due to the EMF readings being well below the Reference Levels across the whole site there is no requirement from an EMF perspective to have any set back distance from any boundary.

There is an existing Zone Substation adjacent to the development and the power supply for the development shall be readily available.

During the design process the location of potential EMF sources shall be taken into consideration in respect to dwellings, places where the public may be present and where electronic equipment is present.

Communications services to the development shall be via NBN Co. optical fibre cable and shall not contribute any EMF.