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**REPORT No EN-S-010420AJ**

**GRA Glebe Island Gypsum Terminal**

with M.V. CSL Adelle

**CHECK OF COMPLIANCE WITH  
EPA ENVIRONMENT PROTECTION LICENCE**

**April 2020**



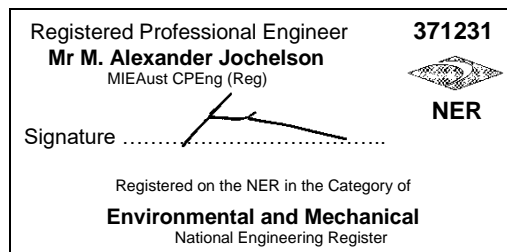
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**This report has been checked and endorsed by  
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- Appendix 4: Time restrictions for unloading of ships at GRA Glebe Island Gypsum Terminal.

## EXECUTIVE SUMMARY

This report presents and discusses results of night-time noise measurements that were carried out during unloading of M.V. CSL Adelle at GRA Glebe Island Gypsum Terminal on 1 April 2020.

The measurements were carried out by Pollution Control Consultancy and Design (PCCD) close to the nearest residential premises (the block of apartments) in 1 Batty Street, Rozelle (Appendix 1).

The purpose of the measurements was to check compliance with the former Condition L6.1 of Environment Protection Licence number: 11906 [1] issued for GRA Glebe Island Gypsum Terminal.

Appendix 2 provides a summary of the results of the measurements, and Appendix 3 provides results of calculations of the A-weighted, equivalent, fifteen-minute sound pressure level ( $L_{Aeq, 15 \text{ min}}$ ) emanating from GRA Glebe Island Gypsum Terminal during all possible scenarios of unloading of M.V. CSL Adelle.

Based on Appendix 3, an easy-to-use and developed by/available from Pollution Control Consultancy and Design (PCCD) MS Excel spreadsheet titled 'GRA - time restrictions for 1, 2 and 3 scenarios' will allow to calculate time restrictions for the  $L_{Aeq, T_i}$  with the accuracy to tenths and for 1, 2 and/or 3 scenarios in each period (day, evening, night) that ensure compliance with the EPA Environment Protection Licence number: 11906 [1].

Alternatively, the  $L_{Aeq, T_i}$  from Appendix 3 and time restrictions for unloading of ships at GRA Glebe Island Gypsum Terminal from Appendix 4 will allow choosing scenarios with applicable time restrictions.

## 1. NOISE CONTROL CRITERIA

In this report, the level of noise emanating from M.V. CSL Adelle unloading at GRA Glebe Island Gypsum Terminal is assessed in terms of the former Condition L6.1 of Environment Protection Licence number: 11906 [1], which read:

L6.1 Noise from the premises must not exceed:

Noise Limits Measured in dB(A)							
Location	Day		Evening		Night		
	$L_{Aeq, 15 \text{ min}}$	$L_{Aeq, \text{ day}}$	$L_{Aeq, 15 \text{ min}}$	$L_{Aeq, \text{ evening}}$	$L_{Aeq, 15 \text{ min}}$	$L_{Aeq, \text{ night}}$	$L_{A1, 1 \text{ min}}$
The residence most affected by noise from the premises.	56	52	56	46	52	45	62

Based on the limits from the above table, Appendix 4 provides time restrictions for unloading of ships at the GRA Glebe Island Gypsum Terminal.

According to the EPA *Noise Policy for Industry* [2], the  $L_{Aeq}$  emanating from industrial noise sources is subject to corrections (penalties) for its tonality, high low-frequency contents and intermittency.

## 2. TYPE, TIME AND LOCATION OF MEASUREMENTS

For the purpose of this report, Pollution Control Consultancy and Design (PCCD) carried out the total of eleven (11) measurements of the A-weighted equivalent sound pressure level ( $L_{Aeq, Ti}$ ) at the nearest residential premises (the block of apartments) in 1 Batty Street, Rozelle, at approximately 230 metres from M.V. CSL Adelle unloading at GRA Glebe Island Gypsum Terminal (Appendix 1).

The measurements were carried out on Wednesday, 1 April 2020, between 1.05 am and 2.25 am, during operations of:

- (1) two Generators (No 2 - middle, and No 3 - portside),
- (2) one Generators (No 3 - portside),
- (3) one Generators (No 3 - portside) and Air Conditioning,
- (4) one Generators (No 3 - portside), Air Conditioning and Ventilation Fans,
- (5) one Generators (No 3 - portside), Air Conditioning and Ventilation Fans and all Conveyors at 35% of speeds,
- (6) one Generators (No 3 - portside), Air Conditioning and Ventilation Fans and all Conveyors at 65% of speeds,
- (7) one Generators (No 3 - portside), Air Conditioning, Ventilation Fans and Crane No 1,
- (8) one Generators (No 3 - portside), Air Conditioning, Ventilation Fans and Crane No 2,
- (9) one Generators (No 3 - portside), Air Conditioning, Ventilation Fans and Crane No 3,
- (10) one Generators (No 3 - portside), Air Conditioning, Ventilation Fans and Crane No 4,
- (11) one Generators (No 3 - portside), Air Conditioning and Ventilation Fans.

### 3. INSTRUMENTATION AND CALIBRATION

The measurements presented in this report were carried out with a NATA-calibrated, Modular, Precision, Real-Time Sound Analyzer type: 2250, serial number: 2736240, with a ½" Prepolarized, Condenser, Free-Field Microphone type: 4189, serial number: 2831979, and with BZ7223 Frequency Analysis software.

The instrument was calibrated acoustically with a NATA-calibrated, B&K Sound Level Calibrator type 4231, serial number: 1821262, before and after the measurements.

The calibration drift was less than 1 dB and thus, according to [3], the results from the instrument are valid.

### 4. RESULTS OF NOISE MEASUREMENTS

The third column of the table in Appendix 2 provides results of measurements of the A-weighted, equivalent sound pressure level ( $L_{Aeq, Ti}$ ) during different operational modes on M.V. CSL Adelle.

Based on these results, the fourth column in Appendix 2 provides results of calculations of the  $L_{Aeq, Ti}$  emanating from the modes (contributions of the different operational modes on M.V. CSL Adelle).

Based on the contributions of the different operational modes on M.V. CSL Adelle, the last column of the table in Appendix 3 provides results of calculations of the  $L_{Aeq, Ti}$  emanating from all possible fifteen scenarios of unloading of M.V. CSL Adelle, each with 35% and 65% speeds of the conveyors (the total of thirty scenarios).

The results of these calculations show that:

1. discharging of M.V. CSL Adelle does not require any time restrictions during the day (7 am to 6 pm), except when all four cranes run and conveyors are at 65% of speeds and then discharging is restricted to 524 minutes per day;
2. discharging of M.V. CSL Adelle with Crane No 1 or Crane No 3 does not require any time restrictions in the evening (6 pm to 10 pm), if the conveyors run at 35% of speeds;
3. there was a substantial, nearly 7 dB(A) difference between the  $L_{Aeq, Ti}$  emanating from all on-board conveyors running at 65% and 35% of their speeds; and
4. the  $L_{Aeq, Ti}$  emanating from each of all cranes was pretty similar.

The results from Appendix 3 (the last column of the table in Appendix 3) should be used with the easy-to-use and developed by/available from Pollution Control Consultancy and Design (PCCD) MS Excel spreadsheet titled 'GRA - time restrictions for 1, 2 and 3 scenarios', which allows to calculate time restrictions for the  $L_{Aeq, Ti}$  with the accuracy to tenths and for 1, 2 and/or 3 scenarios in each period, i.e. day, evening, night, that ensure compliance with the EPA Environment Protection Licence number: 11906 [1].

Alternatively, the results from Appendix 3 (the last column of the table in Appendix 3) and time restrictions for unloading of ships at GRA Glebe Island Gypsum Terminal from Appendix 4 will allow choosing scenarios with applicable time restrictions.

#### IMPORTANT NOTE:

We noticed during the measurements that noise from M.V. CSL Adelle was low and not intrusive in its character.

## BIBLIOGRAPHY

- [1] Environment Protection Authority of New South Wales (EPA) - Environment Protection Licence number: 11906, issued to Gypsum Resources Australia Pty Ltd in relation to its gypsum terminal off Sommerville Road, Rozelle.
- [2] Environment Protection Authority of New South Wales (EPA) - *Noise Policy for Industry* (NPfI) - October 2017.
- [3] Australian Standard: *Acoustics - Description and measurement of environmental noise* (AS 1055:2018).
- [4] Australian Standard: *Quantities and units - Part 7: Acoustics* (AS 2900.7 - 2002).
- [5] Malcolm J. Crocker - *Handbook of Noise and Vibration Control* - John Wiley & Sons, Inc. - 2007.



## **Pollution Control Consultancy and Design**

is a member firm of Consult Australia and Association of Australian Acoustical Consultants (AAAC),

and its principal consultant is a Corporate Member of  
The Institution of Engineers, Australia (MIEAust) and Australian Acoustical Society (M.A.A.S.).

Pollution Control Consultancy and Design (PCCD) is an independent, accredited, acoustical and environmental engineering practice that was established and is managed by **Alex Jochelson**.

Alex has a Master's Degree in Mechanical Engineering (MEMech) and he is a Corporate Member, Chartered Professional Engineer of The Institution of Engineers, Australia, registered on National Professional Engineers Register under No 371231, in the categories of Environmental and Mechanical Engineering [MIEAust CPEng (Reg)].

Alex's well balanced, extensive, multi-disciplinary experience in environmental engineering includes:-

- (1) four-year industrial experience (environment protection specialist at ferro-chromium smelting plant);
- (2) four-year research and design experience (research engineer at university);
- (3) nine-year operational, industrial pollution control experience at the Environment Protection Authority of New South Wales - EPA (engineer); and
- (4) the current, since January 1995, engineering consulting experience as the principal consultant of Pollution Control Consultancy and Design (PCCD).

### **Services provided by Pollution Control Consultancy and Design**

Pollution Control Consultancy and Design (PCCD) provides a comprehensive range of services covering all major aspects of the environment protection: air, noise and water pollution control. These services include:-

- a) air, noise and water pollution measurement, assessment and engineering control;
- b) environmental reviews and audits;
- c) environmental management programs (EMPs);
- d) pollution reduction programmes (PRPs);
- e) environment protection policy and strategy;
- f) submissions to and negotiations with the Environment Protection Authority, Department of Planning, Department of Mineral Resources, Sydney Water, Liquor Administration Board and Local Councils;
- g) "environment impact statements" and "statements on environmental effects" for development consents;
- h) applications for pollution control approvals and licences;
- i) compliance audits for environment protection approvals and licences, and development consents;
- j) interpretation of technical requirements of environment protection legislation;
- k) expert witness services for Land and Environment Court and local courts;
- l) proposals of environmentally acceptable and safe operational conditions and procedures;
- m) development of operational manuals for pollution control systems;
- n) process and functional design of air, noise and water pollution control systems;
- o) selection of optimal pollution control technology, equipment and systems;
- p) supervision of construction, commissioning, operation and maintenance of pollution control systems; and
- q) troubleshooting existing air, noise and water pollution control systems.





Locations of M.V. CSL Adelle at Berth 7 of Glebe Island (green), noise measurement point close to nearest residences (block of apartments) in 1 Batty Street, Rozelle (yellow dot) and Pacific Explorer (blue).

No	Operational Situation	L <sub>Aeq, Ti</sub> measured	Contribution of	L <sub>Aeq, Ti</sub> contribution	Notes
1	Two Generators only (no Air-Conditioning and no Ventilation Fans)	47.8	Two Generators	None	Higher than normal <i>Ambient Noise</i> due to noise from Pacific Explorer berthing at White Bay (generator noise) - blue ship in Appendix 1
2	One Generator [No 3 (portside)]	47.7	One Generator	None	
3	One Generator and Air-Conditioning	47.8	Air-Conditioning	None	
4	One Generator, Air-Conditioning and Ventilation Fans	48.3	Ventilation Fans	38.7	Insignificant contribution
5	One Generator, Air-Conditioning and Ventilation Fans, and all Conveyors at 35% of speeds	49.0	All Conveyors at 35% of speeds	40.7	
6	One Generator, Air-Conditioning and Ventilation Fans, and all Conveyors at 65% of speeds	50.9	All Conveyors at 65% of speeds	47.4	
7	One Generator, Air-Conditioning and Ventilation Fans, and Crane No 1	49.9	Crane No 1	43.4	
8	One Generator, Air-Conditioning and Ventilation Fans, and Crane No 2	50.8	Crane No 2	46.5	
9	One Generator, Air-Conditioning and Ventilation Fans, and Crane No 3	50.1	Crane No 3	44.2	
10	One Generator, Air-Conditioning and Ventilation Fans, and Crane No 4	50.6	Crane No 4	45.9	
11	One Generator, Air-Conditioning and Ventilation, Fans	48.8	-	-	<i>Ambient Noise</i> slightly higher than at start of measurements

**Summary of results of noise measurements and contributions.**



All Conveyers at 35% of speeds and 2 Generators	Crane No 1	Crane No 2	Crane No 3	Crane No 4	Scenarios	L <sub>Aeq</sub> , 15 min
40.7	43.4				Crane No 1	45
40.7		46.5			Crane No 2	47
40.7			44.2		Crane No 3	46
40.7				45.9	Crane No 4	47
40.7	43.4	46.5			Cranes No 1 and No 2	49
40.7	43.4		44.2		Cranes No 1 and No 3	48
40.7	43.4			45.9	Cranes No 1 and No 4	49
40.7		46.5	44.2		Cranes No 2 and No 3	49
40.7		46.5		45.9	Cranes No 2 and No 4	50
40.7			44.2	45.9	Cranes No 3 and No 4	49
40.7	43.4	46.5	44.2		Cranes No 1, No 2 and No 3	50
40.7	43.4	46.5		45.9	Cranes No 1, No 2 and No 4	51
40.7	43.4		44.2	45.9	Cranes No 1, No 3 and No 4	50
40.7		46.5	44.2	45.9	Cranes No 2, No 3 and No 4	51
40.7	43.4	46.5	44.2	45.9	All four cranes together	52

A-weighted, equivalent sound pressure level (L<sub>Aeq</sub>) emanating from different operational scenarios on CSL Adelle.



All Conveyers at 65% of speeds and 2 Generators	Crane No 1	Crane No 2	Crane No 3	Crane No 4	Scenarios	L <sub>Aeq</sub> , 15 min
47.4	43.4				Crane No 1	49
47.4		46.5			Crane No 2	50
47.4			44.2		Crane No 3	49
47.4				45.9	Crane No 4	50
47.4	43.4	46.5			Cranes No 1 and No 2	51
47.4	43.4		44.2		Cranes No 1 and No 3	50
47.4	43.4			45.9	Cranes No 1 and No 4	51
47.4		46.5	44.2		Cranes No 2 and No 3	51
47.4		46.5		45.9	Cranes No 2 and No 4	51
47.4			44.2	45.9	Cranes No 3 and No 4	51
47.4	43.4	46.5	44.2		Cranes No 1, No 2 and No 3	52
47.4	43.4	46.5		45.9	Cranes No 1, No 2 and No 4	52
47.4	43.4		44.2	45.9	Cranes No 1, No 3 and No 4	52
47.4		46.5	44.2	45.9	Cranes No 2, No 3 and No 4	52
47.4	43.4	46.5	44.2	45.9	All four cranes together	53

A-weighted, equivalent sound pressure level (L<sub>Aeq</sub>) emanating from different operational scenarios on CSL Adelle.



L <sub>Aeq</sub> emanating from a ship	Time restrictions (operation for only)		
	Day	Evening	Night
	(7 am - 6 pm)	(6 pm - 10 pm)	(10 pm - 7 am)
55 dB(A)	331 minutes	30 minutes	54 minutes
54 dB(A)	416 minutes	38 minutes	68 minutes
53 dB(A)	524 minutes	48 minutes	86 minutes
52 dB(A)	No restriction	60 minutes	108 minutes
51 dB(A)	No restriction	76 minutes	136 minutes
50 dB(A)	No restriction	96 minutes	171 minutes
49 dB(A)	No restriction	120 minutes	215 minutes
48 dB(A)	No restriction	151 minutes	271 minutes
47 dB(A)	No restriction	191 minutes	341 minutes
46 dB(A)	No restriction	No restriction	429 minutes
45 dB(A)	No restriction	No restriction	No restriction

**Time restrictions for unloading of ships at GRA Glebe Island Gypsum Terminal.**



## NOTES