

**CATTLE BAY MARINA
DEVELOPMENT APPLICATION
AIR QUALITY REPORT
At
CATTLE BAY ROAD EDEN
for
EDEN RESORT HOTEL PTY LTD**

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Contents

1. PROJECT DESCRIPTION	1
1.1. THE PROJECT	1
1.2. REPORT TO SUPPORT DEVELOPMENT APPLICATION	1
1.3. DESCRIPTION OF SITE	1
1.4. CURRENT AIR QUALITY AFFECTING CLOSEST SENSITIVE RECEIVERS	3
1.4.1. Current Air Quality from Cattle Bay Boat Traffic	3
1.4.2. Current Air Quality from Cattle Bay Road Traffic	3
1.4.3. Current Air Quality At Site	3
1.5. PROPOSED HOURS OF OPERATION	3
1.6. LIKELY AIR POLLUTANTS AT THE CATTLE BAY MARINA SITE	3
2. RELEVANT GUIDELINES	3
2.1. AIR QUALITY GUIDELINES-GENERALLY	3
2.2. AIR QUALITY GUIDELINES RECOMMENDATIONS FOR THE CATTLE BAY MARINA,	4
2.2.1. Published Exposure Levels for Airborne Contaminants	4
2.2.2. Comments on Published Exposure Levels for Airborne Contaminants	4
2.2.3. Airborne Contaminant Exposure Levels around Cattle Bay Marina	5
3. VERIFICATION OF AIRBORNE CONTAMINANT LEVEL	5

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1. PROJECT DESCRIPTION

1.1. THE PROJECT

The project involves the construction of car parking, use of two portable building to house Marina Management, shower and toilet facility to be used by the Marina Tenants/Users, the Cattle Bay Marina complete with pontoons, power to each berth.

Services provided by Marina Management include a portable sewage pump-out facility for the Marina Tenants/Users vessels and discharge facility on-shore.

The project does not include any other onshore buildings, workshop, slipway or maintenance facilities.

1.2. REPORT TO SUPPORT DEVELOPMENT APPLICATION

This Development Application Air Quality Report (**DA Air Quality Report**) has been prepared to assist Eden Resort Hotel Pty Ltd with their submission of the Development Application for the proposed recreational Boating Marina at Cattle Bay Road, Cattle Bay Eden.

The report is based on the details given in the following documents:

1. Invitation Email dated 20/03/2015 from Mr. Michael Jarvin
2. Black Architectural Drawings No's DA-DA01/A, A02/B and A03/A
3. Advanced Marina Management Pty Ltd and Royal Haskoning DHV; Operational Environmental Management Plan (**OEMP**) dated March 2015
4. Royal Haskoning DHV Operational Environmental Management Plan dated March 2015

1.3. DESCRIPTION OF SITE

The Cattle Bay Marina site is on Cattle Bay Road Eden which is proposed to be built on the old Eden Cannery Site. The Cattle Bay Road provides access to the site. The existing jetty is to remain and be used as part of the marina and new arms and pontoons added to complete the marina. Marina Management are to be housed in two portable buildings to be located on the existing on-shore hard stand concrete apron surface and Marina Tenants/Users car park is to occupy the remaining hard stand apron areas.



Photo-Proposed Site at Cattle Bay

Road

The existing site is seen outlined in the Google Area Map below

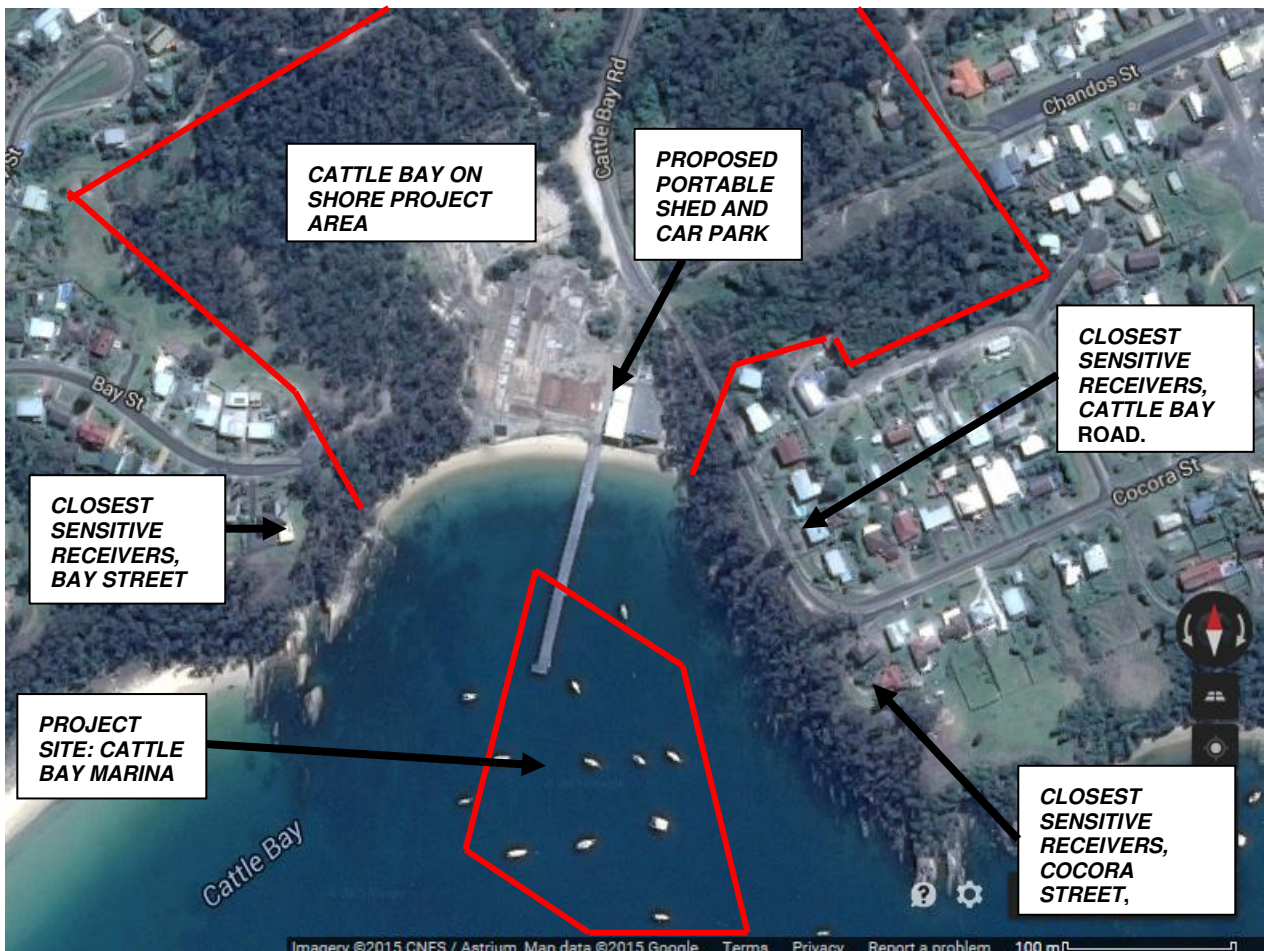


Figure 1: Google Aerial Photo

The closest sensitive receivers to the project site are the following Lots:

- The residential properties at 32 and 40 to 46 Cattle Bay Road which are separated from the marina pontoons by 100 to 150 metres and 90 metres to the entry/exit channel on the north eastern side of the marina project site. These sites are slightly elevated from the water's edge and overlook the project site
- The residential properties at 1, 3, 5 and 7 Cocora Street which are also separated from the marina pontoons by 80 to 200 metres and 75 metres to the entry/exit channel on the north eastern side of the marina project site. These sites are slightly elevated from the water's edge and overlook the project site
- The residential properties at Lot 10, Lot 7086 and at 1 to 8 Bay Street which are separated from the marina jetty from 130 to 150 metres where space has been allocated for commercial and super-yacht berthing at ~120 metres from the berthing channel. These sites are slightly elevated from the water's edge and overlook the project site

The site is located in an area zoned residential and all closest residences are identified on the Google Aerial Photo above.

1.4.CURRENT AIR QUALITY AFFECTING CLOSEST SENSITIVE RECEIVERS

1.4.1.Current Air Quality from Cattle Bay Boat Traffic

The air quality currently affecting the closest sensitive receivers is from the exhausts from the motors fitted to the existing boats on moorings in Cattle Bay as they arrive and leave their moorings at Cattle Bay. The distance from the closest sensitive receiver is from 80 to 150 metres.

1.4.2.Current Air Quality from Cattle Bay Road Traffic

The air quality currently affecting the closest sensitive receivers is from the exhausts from the motors on road vehicles using Cattle Bay Road and from their own vehicles parked on their site. Cattle Bay Road loops behind the Eden Shopping Precinct and carries traffic serving the immediate area only.

1.4.3.Current Air Quality At Site

The site was operating as the Eden Cannery which had road traffic for staff, deliveries and dispatching goods and the cannery process associated with the site. At present the site is unused and locked down so there is currently no cause of adverse air quality contaminants.

1.5.PROPOSED HOURS OF OPERATION

The project is proposed to be available to Marina Tenants/Users continuously, 7 days a week.

1.6.LIKELY AIR POLLUTANTS AT THE CATTLE BAY MARINA SITE

The operation of the Cattle Bay Marina that is likely to produce air pollutants is the exhausts from the motors in the vessels, both at their berths of the marina and their manoeuvring into and leaving the Marina.

The exhaust fumes from the vessels can be from either petrol or diesel driven engines. Petrol engines emissions are predominantly Carbon Monoxide (CO) with some Sulphur Dioxide(SO₂) with a trace of particulate carbon and aromatic hydrocarbons. Diesel engines emissions are predominantly Carbon Monoxide and Nitrogen Oxides(NO_x) with a trace of particulate carbon

2.RELEVANT GUIDELINES

2.1.AIR QUALITY GUIDELINES-GENERALLY

The overriding statutory requirement for management of air quality in a community for scheduled premises is given in the Protection of the Environment Act 1997 [POEO Act].

The POEO Act, Schedule 1 includes Marinas with pontoons with the capacity to handle more than 80 vessels so the Cattle Bay Marina with berthing with 154 vessels is included under these requirements.

The POEO Act, sets out the following:

- Identifies responsibility for scheduled premises
- Defines air pollution to include offensive odours or potentially offensive odours
- Provides a range of tools to manage
- Makes it an offence to do certain things that cause emission of offensive odours

The POEO Act defines **offensive** odours in principle as being an activity that “causes emission ..of air impurities in excess of the standard of concentration and/or the rate”;

Odours caused by domestic use are exempted from these requirements

In this report we refer to the List of Exposure Standards listed in the publication WorkSafe Australia; “Workplace Exposure Standards For Airborne Contaminants, Date of Effect: 22 December 2011”

We have also referred to Section 4 Ventilation of Enclosures used by Vehicles with Internal Combustion Engines and Appendix C, “Outdoor air contaminant levels” contained in the publication; AS 1668.2;2012 “The use of mechanical ventilation in buildings-Part 2 Mechanical ventilation for acceptable indoor air quality” (**AS 1668.2**) as the acceptable standard for concentrations of the relevant air pollutants likely to be present at the Cattle Bay Marina site.

These documents are used to verify safety standards relating to the exposure of the air pollutants likely to be present at the Cattle Bay Marina site.

2.2.AIR QUALITY GUIDELINES RECOMMENDATIONS FOR THE CATTLE BAY MARINA,

2.2.1.Published Exposure Levels for Airborne Contaminants

SafeWork Australia lists the following Time Weighted Averages (**TWA**) published by Workplace Exposure Standards for Airborne Contaminants, date of effect 22 December 2011(**WES**) as shown in the table below. In addition the WES states that monitoring is to be carried out when it is suspected air contamination is present and that “the monitoring location is in the breathing zone of the person”

We have also shown in the maximum 1 day exposure recommended when designing mechanical ventilation for buildings that are used with internal combustion engines given in Appendix C, AS 1668.2

Table 1: Summary of TWA Airborne Contaminant Levels

Source of Air Pollutant	Carbon Monoxide (CO) ①/ ②	Sulphur Dioxide (SO ₂) ①/ ②	Nitrogen Dioxide (NO _x) ①/ ②
Emissions from Petrol Engine	30 ppm/ 9 ppm 1 day a year	2 ppm/ 0.20 ppm 1 day a year	
Emissions from Diesel Engine	30 ppm/ 9 ppm 1 day a year		30 ppm/ 1.2 ppm 1 day a year

① TWA 8 hour time weighted average over a 5 day week

② 1 day a year max given by AS 1668.2, Appendix C,

2.2.2.Comments on Published Exposure Levels for Airborne Contaminants

It can be seen from Table 1 that the AS 1668.2 adopted exposure of likely contaminants is much more strict than the WES requirements.

West and Associates Pty Ltd have used and carried out hand held gaseous tests in many Car Park and Loading Dock situations over the last 30 years as specified by earlier versions and the current version of code AS 1668.2. We have consistently found that their recommendations in Clause 4.5 regarding Loading Docks that exposure problems due to Petrol or Diesel Engine emissions only occur if the loading docks are deeper than 10 metres.

In all cases, even using 10 tonne Fire Trucks as the test vehicle, distances, say under 9 Metres never in our testing gave readings where the recommended 1 day a year exposure was exceeded.

2.2.3. Airborne Contaminant Exposure Levels around Cattle Bay Marina

Our assessment of the airborne contaminant around Cattle Bay Marina indicates they are only from the emission of exhausts from petrol and diesel engines. In all cases, the vessels use external exhausts on their Marina Tenant/User's vessels and the sewer pump-out auxiliary petrol motor is only used in the open.

Because all these identified exhausts are external and not contained in any form of enclosure, the works we have carried out measuring airborne contaminants, all cases resulted in acceptable air quality in the breathing zone of persons that could be affected.

Because of the distance between the vessels and the sewer pump-out cart to the closest sensitive receivers (which are separated by a minimum of 50 metres), they cannot be subjected to offensive odours or air contaminants because of dilution of odours by the distance separating them.

Internal combustion engine exhausts exposure levels on each vessel is not a concern of the POEO Act as the vessels are classed domestic and as such the vessels are exempte.

3. VERIFICATION OF AIRBORNE CONTAMINANT LEVEL

This report based the finding on the SafeWork Australia and also the more strict exposures given in AS 1668.2. West and Associates have found petrol and diesel engine emissions in the open do not propose a safety issue for closest sensitive receivers or site workers and contaminant levels would be dispersed by distance.

We do not believe any monitoring of airborne contaminant would reveal threshold values, let alone listed exposure levels published by SafeWork Australia and so monitoring would not reveal contamination of airborne contaminants of persons either on the project site or at the closest sensitive receivers

End of Report