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Mr Greg Hynd
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1 Australia Avenue
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14 August 2019

Reference: [00000]

Dear Greg

Subject: Site 13-17 Australia Avenue Sydney Olympic Park Project– Air Quality / Odour Assessment

1 Introduction

Ecove Group Pty Ltd ("Ecove") is proposing a mixed use development ("the development project") at 1 Australia Avenue, Sydney Olympic Park ("the site").

The development project is located on the corner of the Australia Avenue and Murray Rose Avenue in the Sydney Olympic Park Central Precinct, an area bounded by Murray Rose Avenue, Olympic Boulevard, Sarah Durack Avenue and Australia Avenue.

The proposed development project is located in the vicinity of the existing Homebush Bay Liquid Waste Treatment Plant (operated by Cleanaway) where there have been historical odour complaints made by residences in proximity to this facility.

Ecove are seeking an assessment of potential odour impacts on the development project, as well as odour mitigation design advice, as required.

2 Project Description

2.1 Development project description

Ecove propose to create a mixed use development that will consist of two buildings accommodating a hotel, serviced apartments, commercial offices, retail outlets and basement car parking.

The site is known as Lot 71 in DP 1134933, located at 13-17 Australia Avenue Sydney Olympic Park and it is approximately 7,711 $m^{2.}$ The local topography is predominantly flat with a few distinguishing features. The surrounding area is characterised by Sydney Olympic Park towards the west of the proposed development and mixed use / commercial premises in other directions. The proposed development is in close proximity to Sydney Olympic Park Train Station.

2.2 Local setting

The development project site is located in the suburb of Sydney Olympic Park, NSW. As stated in Section 1, the area will be subject to an increasing level of mixed use development east of the Liquid Waste Treatment Plant (LWTP) that has the potential to encroach upon the LWTP's current operations. This is significant as the facility has historically been identified as a source of

odour complaints reported to the NSW Environment Protection Authority (EPA) by residents living in the local area.

Figure 1 shows the local setting including the project development location.

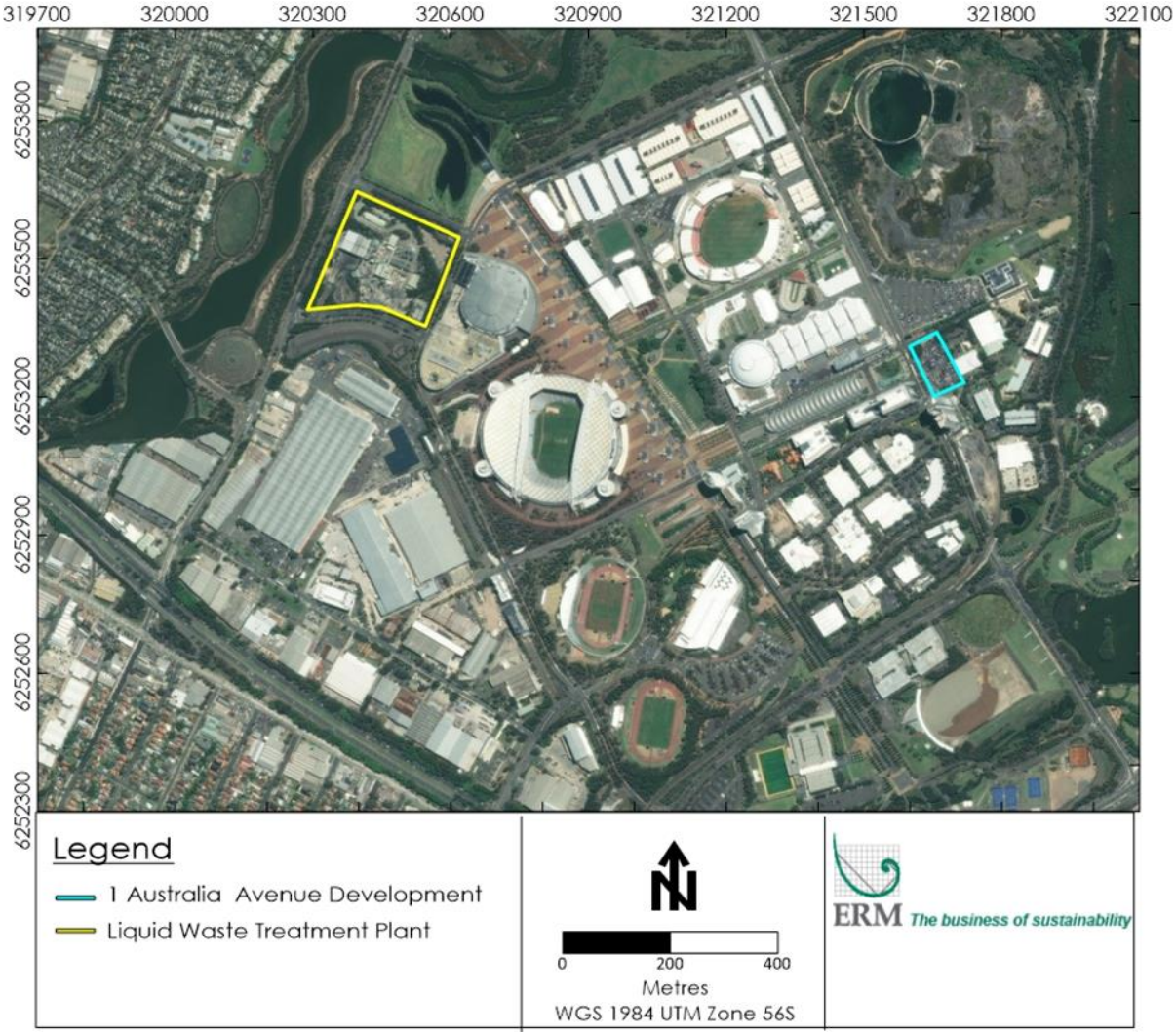

Figure 1: Local setting around the Ecove development project

3 Assessment Approach

ERM (previously Pacific Environment) completed the Carter Street Odour Assessment in October 2013 for the (then) NSW Department of Planning & Infrastructure (DP&I, now DP&E) (PEL, 2013). The Carter Street Odour Assessment evaluated the existing and potential future odorous impacts associated with the LWTP on the (then proposed) Carter Street Urban Activation Precinct, and beyond across the Olympic Park as a whole.

Local land use, terrain and meteorology were considered in a quantitative odour impact assessment that was completed using the CALPUFF atmospheric dispersion model. The study was completed in accordance with the NSW Environment Protection Authority's (EPA) Approved methods for the modelling and assessment of air pollutants in NSW (**NSW EPA, 2005**).

The outcomes of the Carter Street Odour Assessment have been used to examine the potential for odour impacts on the Project, as detailed in Section 6 and 7.

4 Basis of Odour Criteria

The following odour explanation has been referenced from the EPA's Technical Framework, Assessment and management of odour from stationary sources in NSW (**EPA, 2006**). Odour assessment criteria guides decisions about effective odour management but recognises that it may be neither possible nor desirable to achieve 'no odour'. The detectability of an odour is a sensory property that refers to the theoretical minimum concentration that produces an olfactory response or sensation. This point is called the 'odour threshold' and defines one odour unit (1 OU). Therefore, an odour criterion of less than 1 OU would theoretically result in no odour impact being experienced. The criteria for the assessment of odorous air pollutants adopted by the EPA ranges from 2 OU to 7 OU.

The difference between odour criteria is based on considerations of risk of odour impact rather than differences in odour acceptability between urban and rural areas. For a given odour level there will be a wide range of responses in the population exposed to the odour. In a densely populated area there will therefore be a greater risk that some individuals within the community will find the odour unacceptable than in a sparsely populated area.

The most stringent criterion of 2 OU is considered to be acceptable for the Project as per Table 1. Further, an odour criterion of 2 OU has been historically adopted for the Homebush Bay LWTP.

Table 1: Odour Assessment Criteria

Population of Affected Community	Criterion for Odorous Air Pollutants
Urban (2000) and/or schools and hospitals	2
~500	3
~125	4
~30	5
~10	6
≤ ~2	7

5 Historical Correspondence with the Liquid Waste Treatment Plant

It is understood that in February 2014 the EPA amended the licence for Transpacific (company operating the LWTP facility at the time) requiring them to undertake an odour audit. As a result of the audit the EPA requested Transpacific to implement various system improvements to reduce odours from the site. These improvements included:

- Sealing identified leaks from Degrit Building and Process Tanks/Equipment to reduce fugitive emissions;
- Repairing corroded tank covers;
- Reinstating negative air condition in the Degrit Building which was found not to be operating effectively;
- Residue conveyor replacement for better air extraction;
- Deodorising misting system install above bins; and
- Air ducting added to receival tanks.

It is considered that the above measures would provide improvements to the odour amenity of the site. To date, ERM (previously Pacific Environment) has tried to obtain information from Cleanaway (who currently operate the LWTP facility) to verify and detail the exact nature of the listed changes. It is our current understanding (refer Section 8) that these activities have been implemented, however to date we have not been able to source quantitative data to support this.

6 Odour Complaint History

The EPA's Environment Line is the main repository for reporting air pollution from a facility for which an environment protection licence, such as the Homebush LWTP, is held. Local councils however also receive odour complaints and it is observed that many of the complaints received by the Environment Line are complaints that were forwarded to the EPA by council.

The EPA needs to sign off on any request for detailed complaint data to be provided to a member of public by the Environment Line. At the time of writing, the EPA had not yet provided this sign off despite the best efforts of ERM (previously Pacific Environment). However the Environment Line was able to readily supply some high level complaint information.

A summary of the number of odour complaints per year in the Homebush area are presented in Table 2 below. It is noted that the EPA acknowledged that not all odour complaints in the log relate to potential emissions from the LWTP, and that other industries may also contribute to odour complaints. To this end, the following provides a summary of other potential odour sources in the area that may have contributed to the odour complaints:

- Sterihealth (a medical waste disposal facility
- Downer BTI bitumen
- Earth Power (food waste processor)
- AB Mauri (food products - yeast)
- Auburn Resource Recovery Centre
- Sydney Water sewer pumping stations
- Natural processes associated with mangroves and the tidal nature of nearby watercourses.

Table 2: Reported Odour Complaints received by the EPA Environment Line for the Homebush Area

Year	Number of Complaints[1]
2013	51
2014	115
2015	40
2016 (Jan – Feb)	7

[1] Information provided by NSW EPA Environment Line (NSW EPA, 2016)

Based upon the data provided, it is difficult to state conclusively that the additional odour management at the LWTP (discussed in Section 5) has had a material impact on reducing the odour complaints in the Homebush area. Although there is an observed reduction in odour complaints from 115 in 2014 to 40 in 2015, there is no additional granularity in the data presented to provide more robust conclusions.

Based upon the information currently available to ERM (previously Pacific Environment), it is currently assumed that the outcomes from the Carter Street Odour Assessment (**PEL, 2013**) remain applicable. It is acknowledged that this is a conservative approach to the odour assessment discussions.

7 Odour Assessment of the LWTP

The Homebush Bay LWTP operates under Environment Protection Licence (EPL) 4560. Odorous emissions are controlled by the odour control furnace (OCF) and main thermal oil heater (MTOH). The OCF was installed in 2005 to replace the central thermal oxidiser and the residue processing plant thermal oxidiser. When the OCF is not operational, the carbon bed filter (S851) is used as backup control to treat odorous emissions along with the MTOH. In addition, previous odour investigations (**The Odour Unit; 2013**) indicate that odorous emissions are expected from the truck unloading bay and the residual bin.

To characterise the odour emissions from the LWTP when it is operating as normal and during worst case emissions, four scenarios were modelled, namely:

- Scenario 1 – Normal operations with the OCF operating (S851 not operating);
- Scenario 2 – Worst case operations with OCF operating (S851 not operating);
- Scenario 3 – Normal operations with S851 operating (OCF not operating); and
- Scenario 4 – Worst case operations with S851 operating (OCF not operating).

It is instructive to contextualise the four scenarios evaluated. Scenario 1 to 4 essentially represent a descending level of odour control, from normal operations (scenario 1) through to worst case upset odour emissions from the LWTP facility (scenario 4).

7.1 Ground level concentrations

The odour unit contours for the four modelled scenarios from the Carter Street Odour Assessment, as they relate to the Project boundary, are shown in Figure 2. The red line represents the 2 OU criterion and the black line 1 OU.

Figure 2 shows that scenarios 1, 2 and 3 are not anticipated to result in adverse odour impacts at, or within, the Project boundary.

Under Scenario 4 modelling, the 2 OU odour performance criterion is predicted to be experienced (however not exceeded) in the vicinity of the proposed development site at Australia Avenue.

Dispersion model outputs for scenario 4 effectively represent maximum predicted odour concentrations, under a ‘worst-worst case’ odour emission scenario. It may be regarded as worst-worst case since it combines worst case odour emission rates from the LWTP (failure of the primary odour control unit alongside worst-case observed odour emissions) with worst case dispersion meteorology.

The probability of all these variables aligning (upset odour conditions combined with poor dispersion meteorology) is such that this scenario is considered extremely unlikely to occur in reality. Further, under such conditions, there would be odour impacts experienced across the majority of the Sydney Olympic Park, including all stadia, commercial and retail premises. It is our current understanding that such events do not occur.

Further, it is noted that the EPA has required the LWTP to complete additional odour mitigation measures since the production of the Carter Street Odour Assessment. While the status of these improvements is not known, it is considered that any additional measures would reduce the ‘worst-worst case’ predictions (along with all other Scenario impacts).

Even under such ‘worst-worst case’ odour emissions / meteorology, the 2 OU odour performance criterion in the vicinity of the proposed development at 13-17 Australia Avenue is anticipated to be met (i.e. not exceeded).

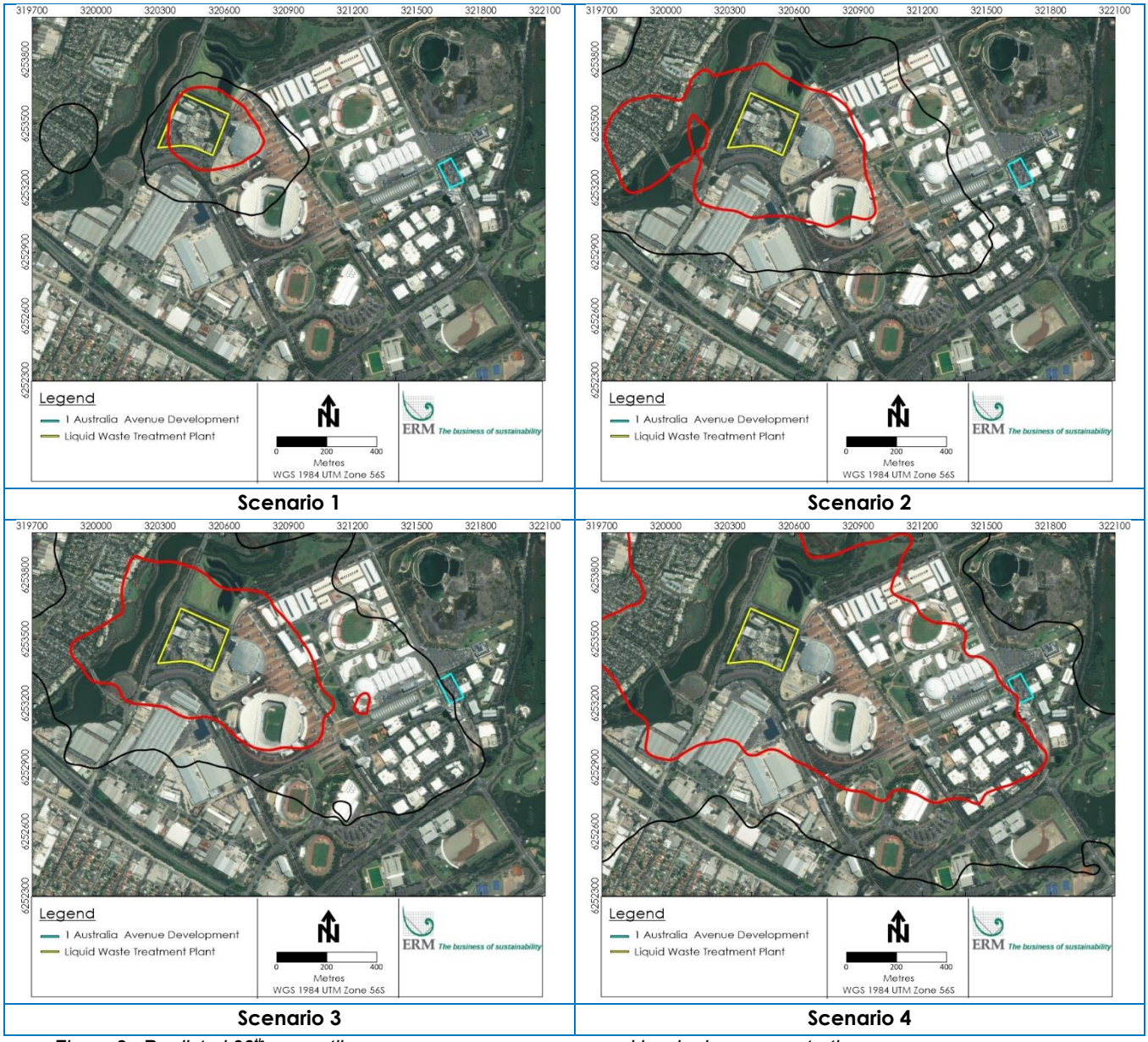

Figure 2: Predicted 99th percentile nose-response average ground level odour concentrations

8 Contextualising the Impacts of the LWTP

As stated within this odour report, it is considered highly unlikely that upset odour conditions at the LWTP, as modelled, would coincide with the highly specific meteorological conditions required to cause adverse odour at the development site.

It is noted that "upset conditions", in terms of odour emissions could comprise a multitude of scenarios in terms of dispersion modelling, such that it would be possible to show modelled outcomes of adverse odour under certain specific conditions. However, the missing aspect is the probability / risk of occurrence. It is not useful to merely show that an adverse impact is hypothetically possible without both contextualising the risk and providing some process to mitigate such impacts.

Odour emissions from the LWTP are best controlled through site processes and housekeeping. Thus, development of an effective operational odour management plan for the LWTP is more useful than demonstration through modelling that a given impact could potentially occur as a result of some form of site management / equipment failure.

Relevant to the above, ERM (previously Pacific Environment) met with the LWTP management in 2016 to understand operational odour management at the site, as well as recent odour complaints history.

Regarding alternative odour studies, it is our understanding following the meeting with the LWTP that additional odour investigations / audit has been completed for the site by The Odour Unit as part of a Pollution Reduction Program within their Environment Protection Licence. While we have not obtained this document, it is our understanding that this provides quantitative measurements that support the site's view that odour abatement, management and control has been significantly improved since the odour emission data referenced by ERM (previously Pacific Environment) was collected.

Perhaps most importantly, during our meeting with the LWTP management it was stated that the community action / dialogue group that was originally set up to address odour issues from the LWTP has been voluntarily disbanded. This is reportedly since, in the residents own view, that odour from the LWTP is no longer considered a significant issue for offsite receptors.

9 Conclusion

A review of the previous odour modelling of the existing LWTP and its potential to impact upon the proposed Ecove development project has been completed. This review provides clarification on both the predicted magnitude and frequency of any potential odour impact at the proposed development project in Homebush.

Only under a ‘worst-worst case’ odour emission scenario is it anticipated that the 2 OU odour performance criterion is met (but not exceeded) in the vicinity of this development site. On this basis, it is considered that the risk of odour impacts from the LWTP under normal, and even upset, conditions is extremely low.

I trust that the above is adequate to address the likelihood of odour impacts of the LWTP upon the Ecove development project. Do not hesitate to contact the undersigned if you would like any additional clarification.

Yours sincerely,

Damon Roddis
Partner – Air Quality

10 References

NSW EPA (2005). “Approved Methods for the Modelling and Assessment of Air Pollutants in NSW”, August 2005

NSW EPA (2006). “Assessment and management of odours from stationary sources in NSW”, November 2006

NSW EPA (2016). NSW EPA Environment Line.

Pacific Environment (2013). “Carter Street Olympic Park – Odour Assessment”, Final Report, 15 October 2013 available at: https://majorprojects.affinitylive.com/public/dfb09039a4b9463300a4d4370d83931a/11.%20Appendix%20I%20Odour%20Assessment.pdfd.pdf

The Odour Unit (2013). “Technical Memorandum: Odour Dispersion Modelling Study of the Homebush Facility”, January 2013. Prepared for Transpacific Industries Pty Ltd