14 March 2016

Amar Prashant
Development Manager
Mirvac
Level 26, 60 Margaret Street
Sydney NSW 2000

Dear Amar,

Re: 2 Figtree Drive (Site 53), Sydney Olympic Park – Addendum

1 INTRODUCTION

Pacific Environment provided a letter report regarding potential for odour impacts from a Liquid Waste Treatment Plant located within Sydney Olympic Park on a proposed residential development at Site 53, 2 Figtree Drive ("the proposed development"). This report comprises reference "*20515C Mirvac 2 Figtree Drive Odour L1 Final*", dated 20 July 2015 (**PEL, 2015**; "the PE Odour Letter").

The NSW Department of Planning and Environment (DP&E) provided commentary in this letter as follows:

The Odour Assessment should be updated to provide further justification of how the adopted odour criteria was selected and the potential impacts of the 1OU odour criteria on the site.

This current letter provides further clarification following the DP&E's most recent correspondence on this issue.

2 BASIS OF ODOUR CRITERIA

The following odour explanation has 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 recognise 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.

As noted in the PE Odour Letter, 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.

An odour impact assessment criterion of 7 OU would be acceptable to the average person, but as the number of exposed people increases, the probability of a more sensitive individual being exposed

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increases. The most stringent criterion of 2 OU is considered to be acceptable for the whole population. An odour criterion of 2 OU has been historically adopted for the Homebush Bay LWTP.

Given that a maximum concentration of 7 OU is considered acceptable to the average person, and maximum odour unit concentrations at the proposed development are predicted to be in the range of 2 OU (refer **Figure 3.1**), it is not anticipated that odour from the operations of the LWTP are likely to be detected by future residents.

The above discussion is relevant to the *magnitude* of the proposed impact, however it is instructive to additionally consider the *frequency* of such an event, evaluated below.

3 ODOUR ASSESSMENT OF THE LWTP

The Carter Street Odour Assessment was prepared by Pacific Environment for the (then) NSW Department of Planning & Infrastructure (DP&I, now DP&E) in October 2013 (**PEL, 2013**). The Carter Street Odour Assessment evaluated the existing and potential future odorous impacts associated with the LWTP on the proposed 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 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)
- Scenario 4 – Worst case operations with S851 operating (OCF not operating)

The PE Odour Letter (**PEL, 2015**) identified that scenarios 1, 2 and 3 were not predicted to exceed the 2 OU criterion at the proposed development. However, scenario 4 indicated that this level may be exceeded under worst case operational and meteorological conditions.

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.

Dispersion model outputs for scenario 4 thus 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. Thus the likelihood of all these two variables aligning (upset odour conditions combined with poor dispersion meteorology) is such that this scenario is 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 are not witnessed.

To illustrate the the predicted odour impacts at the proposed development under the 'worst-worst' case scenario, scenario 4 (**Figure 3.1**) of the PE Odour Letter is reproduced below.

Figure 3.1: Predicted 99th percentile nose-response average ground level odour concentrations – Scenario 4

The results from the dispersion modelling were further evaluated using discrete receptor locations within the proposed development site. The discrete receptor results indicate that the odour concentrations predicted at the boundary receptors range from 1.8 OU on the south and 2.4 OU on the north. While it is not meaningful to discuss odour units in less than whole numbers, this is reported to illustrate that even under worst-worst case odour modelling, there is predicted to be no exceedances of the 2 OU odour criterion (i.e. the most stringent odour criterion is satisfied at the proposed development).

Finally, as noted in the PE odour letter, it is understood that in February 2014 the EPA amended the licence for Transpacific requiring them to undertake an odour audit. As a result of the audit the EPA requested Transpacific implement various system improvements to reduce odours. 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 originally assessed within the Carter Street Odour Assessment.

4 CONCLUSION

A review of the previous odour modelling of the existing LWTP and its potential to impact upon proposed development at 2, Figtree Drive, Sydney Olympic Park has been completed.

This review provides additional clarification on both the predicted magnitude and frequency of any potential odour impact at the proposed development.

Only under a ‘worst-worst case’ odour emission scenario is it anticipated that the 2 OU odour performance criterion would be met (but not exceeded) at this development site.

The likelihood that upset odour conditions would combine with poor dispersion meteorology (i.e. the ‘worst-worst case’ referred to above) is such that this scenario is extremely unlikely to occur in reality.

On this basis, it is considered that the risk of odour impacts from the LWTP under normal, and even upset, conditions is extremely low. This is without considering the additional operational improvements implemented at the LWTP since the publication of “*20515C Mirvac 2 Figtree Drive Odour L1 Final*”, dated 20 July 2015 (**PEL, 2015**).

I trust that the above is adequate to address DP&E comments as to the likelihood of odour impacts of the LWTP upon the proposed development site. Do not hesitate to contact the undersigned if you would like any additional clarification.

Yours sincerely

D.A. Roddis

Damon Roddis
Principal / General Manager (NSW)
Pacific Environment Limited

5 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

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

Pacific Environment (2015). "20515C Mirvac 2 Figtree Drive Odour L1 Final", Final Report, 20 July 2015

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