



THE ODOUR  
UNIT *m<sup>3</sup>*



# **Veolia Environmental Services (Australia) Pty Limited**

---

**Clyde Waste Transfer Terminal**

---

**Odour Audit XVII**

**May 2011**

**THE ODOUR UNIT PTY LTD**

**ACN 091 165 061**

**Australian Technology Park  
Locomotive Workshop  
Suite 16012, 2 Locomotive St  
Eveleigh, NSW 2015**

This document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. This document should not be used or copied without written authorisation from THE ODOUR UNIT PTY LTD or VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD.

**Project Number: N1473**

<b>Report Revision</b>		
<b>Revision Number</b>	<b>Date</b>	<b>Description</b>
Version 1	22 July 2011	Version 1 for comment.
Version 2	04 August 2011	Draft Report
Version 3	05 August 2011	Final Report issued
<b>Report Preparation</b>		
Report Prepared By: T. Schulz		Approved By: T. Schulz
Report Title: Veolia Environmental Services (Australia) Pty Limited Clyde Waste Transfer Terminal – Odour Audit XVII		

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>4</b>
<b>2</b>	<b>FINDINGS.....</b>	<b>5</b>
<b>2.1</b>	<b>Assessment of General Housekeeping.....</b>	<b>5</b>
2.1.1	Transfer Building .....	5
2.1.2	Container Packing Area and Site Roadways .....	5
2.1.3	Odour Extraction System Maintenance.....	6
2.1.4	Odour Minimising Procedures.....	6
2.1.5	Transfer Building .....	6
2.1.6	Truck Entrance Plastic Strips.....	6
2.1.7	Smoke Testing.....	7
<b>2.2</b>	<b>Odour Complaints Handling and Meteorological Data.....</b>	<b>8</b>
2.2.1	Odour Complaints Handling.....	8
2.2.2	Meteorological Data.....	9
<b>2.3</b>	<b>Ambient Odour Assessment.....</b>	<b>9</b>
<b>3</b>	<b>RECOMMENDATIONS/FOLLOW-UP .....</b>	<b>11</b>
<b>3.1</b>	<b>Fugitive emissions .....</b>	<b>11</b>
3.1.1	Transfer Building .....	11
3.1.2	Compactor Area .....	11

**Appendix A:** Odour Extraction System Service Report

**Appendix B:** Weather Data Calibration Reports

**Appendix C:** FAOA Plot and Field Sheets

---

## 1 INTRODUCTION

---

The Odour Unit Pty Ltd (TOU) was commissioned by Veolia Environmental Services (Australia) Pty Ltd (VES) to undertake the seventeenth odour audit on the Clyde Transfer Terminal (CTT) on 17 May 2011. This Odour Audit is the seventh to be carried out since the commissioning of the new forced air extraction system within the transfer building. Odour Audit XVII covers the 6-month period from December 2010 to May 2011. The audit was carried out by Terry Schulz, Principal of The Odour Unit Pty Ltd.

Odour Audit requirements of the Conditions of Consent – 48(f) are outlined below:

*48. The Odour Management Plan must address, but is not necessarily limited to, the following issues:*

*(f) An odour audit program which provides for a comprehensive odour audit of the premises and nearby commercial and residential areas, by an independent, appropriately qualified and experienced person, to be conducted 3-monthly for the initial 24 months of receiving un-containerised waste at the terminal, 3-monthly for the 12 months following commissioning the odour control system subject to MOD-133-11-2006, and 6-monthly thereafter, unless otherwise approved in writing by the Director-General.*

As with previous Audits, Odour Audit XV focused on issues relating to general housekeeping, fugitive odour emissions from the transfer building, ground level odour impacts, meteorological monitoring, complaints handling and actions on past Odour Audit recommendations. The approach included a general inspection and smoke testing of the transfer building, inspection of the container packing area and site access roads; inspection of the complaint register; review of the site meteorological data log and equipment maintenance/calibration; and an off-site downwind field ambient odour survey.

At the time of the Audit a light wind from the south was blowing.

---

## 2 FINDINGS

---

### 2.1 Assessment of General Housekeeping

#### 2.1.1 Transfer Building

There was approximately 200 tonnes of putrescible waste on the floor according to the Site Manager. This tonnage was within the normal range, following the previous audit where higher than normal tonnages were on the floor, due to the effects of one compactor being out of service at the time. The transfer building floor area not covered by waste material was observed to be very clean, with no evidence of leachate or aged material. General housekeeping procedures of the transfer building were good, as observed during a truck-unloading sequence. The site's front-end loaders cleared the floor area putrescible waste on a regular basis, minimising the exposed area of the MSW.

As with previous audits, and consistent with TOU's experience at other transfer stations, there was a weak to distinct level of odour observed within the building.

#### 2.1.2 Container Packing Area and Site Roadways

The container packing area and site roadways were very clean and well managed with no putrescible waste or leachate present. The container compacting/train packing area had the usual weak garbage odour present but it was confined to this area only. This odour was observed to increase for a short period of 30-40 seconds, when one of the two compactors compact the waste into a container. The air contained within the waste and the empty container (approximately 30 m<sup>3</sup>) that is forced to vent to atmosphere is considered to have the potential to be detectable off-site. Independently of this Audit TOU and VES are investigating this intermittent odour emission, with the view to the possible capture and diversion to the building extraction and stack system.

As with previous audits, the Site Manager informed the TOU auditor that the containers are cleaned off site at Veolia's Woodlawn facility. The weight of each container is monitored to determine if there is any waste that has not been removed

completely from each container, which in turn reduces the likelihood of the containers contributing to the site's odour levels.

### 2.1.3 Odour Extraction System Maintenance

Service documentation was provided and inspected for the maintenance of the odour extraction system (**Appendix A**). Service logs were provided for February and March 2011. Each service log provided showed that the required maintenance was taking place and the odour extraction system was operating well. It was noted that, during the service visit on 24 March 2011, the fan speed was increased from 40 Hz to 50 Hz, increasing the exit velocity in the stack to 22.5 m/s. It is understood that this was a response to a recent odour complaint.

### 2.1.4 Odour Minimising Procedures

The Site Manager informed the auditor that odour minimisation procedures continue to be regularly reviewed at Tool Box meetings and new issues/recommendations are raised with all staff members at these meetings.

### 2.1.5 Transfer Building

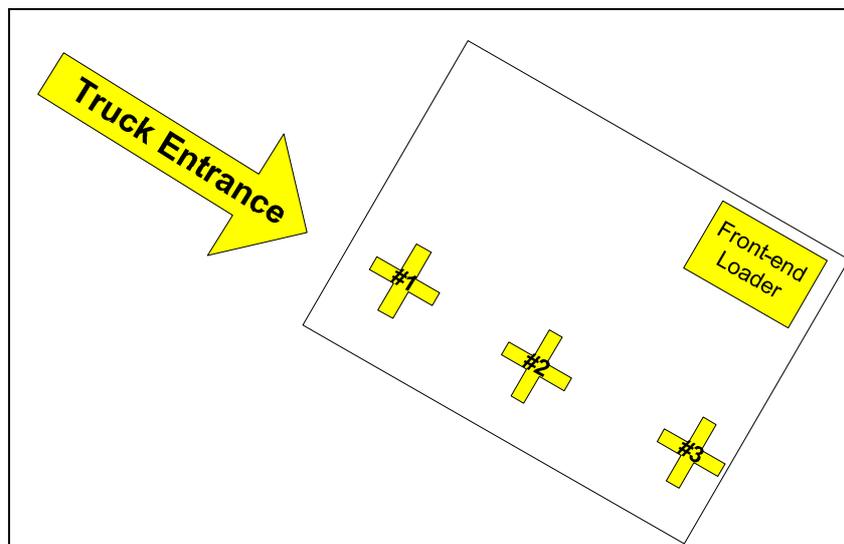
Inspection of the transfer building revealed that the rubber mats that seal the breezeways were all in place, with none requiring any repair or attention. In previous audits it was noticed that several of the mats required repair. This represents an improvement in the maintenance of the mat system. Mats that were identified in the December 2011 as having fallen down had been repaired. All other doors and roller shutters of the transfer building were found to be shut at the time of the odour audit, reducing the likelihood of odour impacts detected offsite. Similarly, the louvres on the end walls of the Transfer Building were observed to be permanently shut.

### 2.1.6 Truck Entrance Plastic Strips

The truck entrance strips of the Transfer Building, used to reduce odour escaping through the opening, were found to be intact. Experience has determined that these strips contribute to containing odour within the building. It is understood that the maintenance of the plastic strips is part of daily operations.

### 2.1.7 Smoke Testing

As per previous audits smoke testing was carried out within the Transfer Building to assist in determining the effectiveness of the forced air extraction system as well as well as the extent to which the transfer building has been sealed from leaks. Smoke was released from within the building from three different points within the transfer building. **Figure 1** shows the 3 points where the smoke was released within the Transfer Building. These are identical locations to that used in previous audits.



**Figure 1:** Smoke testing release points within the Transfer Building.

#### **Smoke Testing Point #1**

Smoke testing was carried out at the truck entrance and the smoke was observed to initially move upwards towards the roof and then towards the extraction fan. There was no observed movement towards the truck entrance

#### **Smoke Testing Point #2**

Smoke released from the second point initially moved upwards in eddies and was gradually drawn into the extraction system.

#### **Smoke Testing Point #3**

Smoke released at this point initially rose gradually before being drawn upwards to the extraction system.

The overall finding of the smoke testing was that the extraction system was effective in maintaining the stack as the main emission point of air from the building, with no evidence of any fugitive odour releases.

## 2.2 Odour Complaints Handling and Meteorological Data

### 2.2.1 Odour Complaints Handling

Six odour complaints were received by VES during this period and are listed along with the handling of the complaints in **Table 2.1**. Two of these complaints were received from DECCW, with the remaining complaints directly from Manildra.

Table 2.1: Odour complaints received by CTT January 2011 – March 2011		
Date	Complainant	Response
25/01/2011 1239 hrs	Manildra	<ul style="list-style-type: none"> <li>Site manager could not detect any odour at the time</li> <li>Both extraction fans running</li> <li>Waste level on floor noted (150 tonnes)</li> <li>Corresponding meteorological conditions logged (295 degrees at 2.6 m/s)</li> </ul>
07/02/2011 1008 hrs, received 1047 hrs	Anonymous, through DECCW	<ul style="list-style-type: none"> <li>Electronic reply to DECCW on 11/02/2011</li> <li>Corresponding meteorological conditions logged (166 degrees, 1.9 m/s)</li> </ul>
9/02/2011 no time provided	Manildra	<ul style="list-style-type: none"> <li>Site manager determined that the odour could have come from a fully loaded train</li> <li>High pressure road cleaning implemented</li> <li>Corresponding meteorological conditions logged (189 degrees, 1.4 m/s)</li> </ul>
10/02/2011 2011 no time provided, received 1403 hrs	Manildra	<ul style="list-style-type: none"> <li>No action recorded</li> <li>Corresponding meteorological conditions logged (243 degrees, no velocity recorded)</li> </ul>
07/03/2011 1037 hrs	Anonymous, through DECCW	<ul style="list-style-type: none"> <li>No action recorded</li> <li>Corresponding meteorological conditions logged (62 degrees, 3.0 m/s)</li> </ul>
25/03/2011 no time provided, received 1038 hrs	Manildra	<ul style="list-style-type: none"> <li>Site manager detected odour from cracked container floor and leachate escape</li> <li>Complainant informed of this</li> <li>Container sent to Woodlawn for repair</li> <li>Corresponding meteorological conditions logged (200 degrees at 4.2 m/s)</li> </ul>

The response by VES on 25/1, 7/2, 9/2 and 25/3 was found to be appropriate and adequate. While further documented action is required for complaints received on 10/2 and 7/3 it is understood that notification to the site provided on 7/3 was received 2.5 hours after the complaint was logged. Notwithstanding this, future complaints should be thoroughly documented.

### 2.2.2 Meteorological Data

The meteorological data provided to TOU for the period from December 2011 to May 2011 was inspected and found to be in good order. As previously, observations were recorded in 15-minute intervals, and included all parameters necessary to develop a meteorological dataset for odour dispersion modelling.

The weather station is located in an accessible area with no vegetation overgrown immediately around the weather station pole. Servicing and calibration were carried out as required in February and May 2011 by Hydrometric Consulting Services. The weather data calibration reports for both service visits are attached in **Appendix B**.

## 2.3 **Ambient Odour Assessment**

At present, no Australian Standard exists for field based ambient odour assessment surveys. Consequently, The Odour Unit utilises a method for assessing the ground level impacts of odour emissions using a modified version of the German Standard VDI 3940 (1993) – ‘Determination of Odorants in Ambient Air by Field Inspections’.

Field based ambient odour surveys are considered a valuable odour impact assessment tool as previous experience with ambient odour sampling and subsequent olfactometry testing suggests that accurate and useful ambient odour concentration data is difficult to obtain. Therefore, TOU has adopted a more practical approach based on the field measurement of odour intensity. With this method, calibrated and experienced odour specialists traverse the downwind surrounds of odour sources in a strategically mapped pattern, assessing the presence, character and intensity of any odours encountered and recording these observations along with wind speed and direction.

An ambient odour assessment was performed offsite of the Clyde facility on 17/05/2011 (1140 – 1215). The ambient odour assessment focused offsite as required by the Conditions of Consent on “.....*nearby commercial and residential areas*.....” (Section 48 (f)). The TOU assessor firstly determined the wind direction using a compass and then assessed downwind locations of the terminal building.

The assessor spent a few minutes at each assessment location in order to gauge the effects of any odour impact. If an odour was detected at a location, the assessor attempted to characterise it. The general aim was to determine the extent of the impact of odours off-site and rank their intensity. The ranking scale for the German Standard VDI 3940 ‘Determination of Odorants in Ambient Air by Field Inspections’ was used for the intensity assessments. The standard’s ranking system is based on the following seven-point intensity scale.

#### **VDI 3940 – Intensity Scale**

- 0 Not Detectable
- 1 Very Weak
- 2 Weak
- 3 Distinct
- 4 Strong
- 5 Very Strong
- 6 Extremely Strong

Apart from a very weak intermittent odour being detected by the assessor at the entrance roadway to the plant (1140 hrs) no identifiable plant odour could be detected at other locations. The southerly direction of the wind restricted the survey to the north of the plant, extending to the northern side of Parramatta Road. The field log sheets and odour impact map are attached as **Appendix C**.

---

## 3 RECOMMENDATIONS/FOLLOW-UP

---

### 3.1 Fugitive emissions

#### 3.1.1 Transfer Building

The management of the rubber mats sealing the breezeway around the Transfer Building has resulted in the system being found to be in good condition. This is an improvement on previous audits findings.

#### 3.1.2 Compactor Area

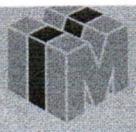
The findings of the current investigation into the possible fugitive emissions from the compactor area should be documented, and any technical mitigation measures incorporated into the standard operating and monitoring procedures for the site.

Overall, this audit found that the operation and maintenance of the odour management system at the plant were most satisfactory. Some improvement to the documentation of actions arising from odour complaints is needed, to ensure that there is always an investigation into the possible source of each complaint.



## **Appendix A –**

# **Odour Extraction System Service Report**



TRIPLE M  
'the team you can trust'

# Service Docket

ACN 063 395 013 ABN 50 063 395 013  
Triple M Industrial Estate  
Unit 5, 47 Day Street North  
Silverwater NSW 2128  
Tel: (02) 9737 8711 Fax: (02) 9737 9715  
After Hours Service: 0414 737 666

**CHARGE TO:** THIS IS NOT A TAX INVOICE - TAX INVOICE TO BE ISSUED UNDER SEPARATE COVER

Name Clyde Date 8/12/11  
 Address \_\_\_\_\_ Job No 1996  
 Building/Structure No. \_\_\_\_\_ Order no \_\_\_\_\_  
 Equipment ID No. \_\_\_\_\_ Type of service \_\_\_\_\_ Service Call  After hours call  Maintenance   
 Fault \_\_\_\_\_  
 OH&S \_\_\_\_\_

Root Cause \_\_\_\_\_  
 Why \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**DESCRIPTION OF WORK DONE**

*Arrived on site checked fans, motors and VSD'S.  
 all running ok.*

Technician sign on Jono Employee code TL-02

**SERVICE RECORDS**

Materials Used	Order No.	Date	Ordinary	Overtime	Travel	Total
		DD/MM/YY				
		DD/MM/YY				
		DD/MM/YY				
		DD/MM/YY				
		DD/MM/YY				

Oxy/Act  Vac pump  Recovery unit  Nitrogen  Consumables  Tolls  Parking  Total

Mechanic's Signature \_\_\_\_\_ Client's Signature \_\_\_\_\_

Claims will be made on a weekly basis for extended service work. If insurance is involved, payment is the responsibility of our client, not the insurance company.

SERVICE REPORT No. 075161 STATUS:  STATUS:  STATUS:  STATUS:  STATUS:

**JOB STATUS:** 1 - Completed 2 - Not Completed 3 - Quote to Follow 4 - Parts Needed 5 - Customer to Advise

White - Customer Copy Yellow - Office Copy





TRIPLE M  
'the team you can trust'

# Service Docket

ACN 003 395 013 ABN 50 003 395 013  
Triple M Industrial Estate  
Unit 5, 47 Day Street North  
Silverwater NSW 2128  
Tel: (02) 9737 8711 Fax: (02) 9737 9715  
After Hours Service: 0414 737 666

**CHARGE TO:** THIS IS NOT A TAX INVOICE - TAX INVOICE TO BE ISSUED UNDER SEPARATE COVER

Name Clyde Transfer Station Date 24/3/11  
 Address \_\_\_\_\_ Job No 2363  
 Building/Structure No. \_\_\_\_\_ Order no \_\_\_\_\_  
 Equipment ID No. \_\_\_\_\_ Type of service Service Call  After hours call  Maintenance   
 Fault Small complaints.  
 OH&S \_\_\_\_\_  
 Root Cause \_\_\_\_\_  
 Why \_\_\_\_\_  
 Why \_\_\_\_\_

**DESCRIPTION OF WORK DONE**

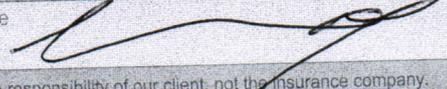
Arrived on site checked motors and belts  
 cleaned VSD's checked Bearings.  
 all running ok.  
 increased VSD speed from 40 Hz to 50 Hz  
 to gain more air flows  
 22.5 m/s from the stacks.

Mechanic sign on Jano Employee code TEION

**SERVICE RECORDS**

Materials Used	Order No.	Date	Ordinary	Overtime	Travel	Total
		DD/MM/YY				
		DD/MM/YY				
		DD/MM/YY				
		DD/MM/YY				
		DD/MM/YY				

Oxy/Act  Vac pump  Recovery unit  Nitrogen  Consumables  Tolls  Parking  Total

Mechanic's Signature  Client's Signature 

Claims will be made on a weekly basis for extended service work. If insurance is involved, payment is the responsibility of our client, not the insurance company.

SERVICE REPORT No. 075185 STATUS:  STATUS:  STATUS:  STATUS:  STATUS:

**JOB STATUS:** 1 - Completed 2 - Not Completed 3 - Quote to Follow 4 - Parts Needed 5 - Customer to Advise

White - Customer Copy Yellow - Office Copy





**Appendix B -  
Weather Data Calibration Reports**

# Hydrometric Consulting Services Pty Ltd

ABN 16 091 437 071

9 May 2011

Stephen Bernhart  
Environmental Monitoring Officer  
Veolia Environmental Services

## Re – Quarterly service of weather stations

Dear Stephen,

As per our service agreement, on the 6/05/11 HCS undertook the service, calibration and maintenance of the weather stations located at the Clyde and Horsley Park sites. Field readings were obtained by a combination of a Kestral 3500, compass, Monitor Solar Radiation field unit and HS TBRG calibration device. Details are as follows

Clyde

Sensor	Actual (field)	Logger
Temperature – 10m	17 deg *	16.2 deg
2m	17 deg *	16.3 deg
Relative Humidity	53%	51%
Wind Speed	2.6 m/sec at ground	2.67 m/sec
Wind Direction	200 deg	200 deg
Solar Radiation	550 w/sq.m	560 w/sq.m
TBRG	10mm	20 tips (0.5mm per tip)
Battery	13.2v Solar 20.6v	

\* Note 1: field reading is not inside the radiation shield

Note 2: ignore rainfall tips logged at 1025 as these were testing and calibration.

### Additional Items

1. Installation sprayed for insects.
2. Weeds and bush trimmed.

# Hydrometric Consulting Services Pty Ltd

ABN 16 091 437 071

25 February 2011

Stephen Bernhart  
Environmental Monitoring Officer  
Veolia Environmental Services

## Re – Quarterly service of weather stations

Dear Stephen,

As per our service agreement, on the 25/02/11 HCS undertook the service, calibration and maintenance of the weather stations located at the Clyde and Horsley Park sites. Field readings were obtained by a combination of a Kestral 3500, compass, Monitor Solar Radiation field unit and HS TBRG calibration device. Details are as follows

Clyde

Sensor	Actual (field)	Logger
Temperature – 10m	29 deg *	28 deg
2m	29 deg *	29 deg
Relative Humidity	34%	33.8%
Wind Speed	1.0 m/sec at ground	1.25 m/sec
Wind Direction	310 deg	310 deg
Solar Radiation	536 w/sq.m	540 w/sq.m
TBRG	10mm	20 tips (0.5mm per tip)
Battery	13.2v Solar 19.6v	

\* Note 1: field reading is not inside the radiation shield

Note 2: ignore rainfall tips logged at 1200 as these were testing and calibration.

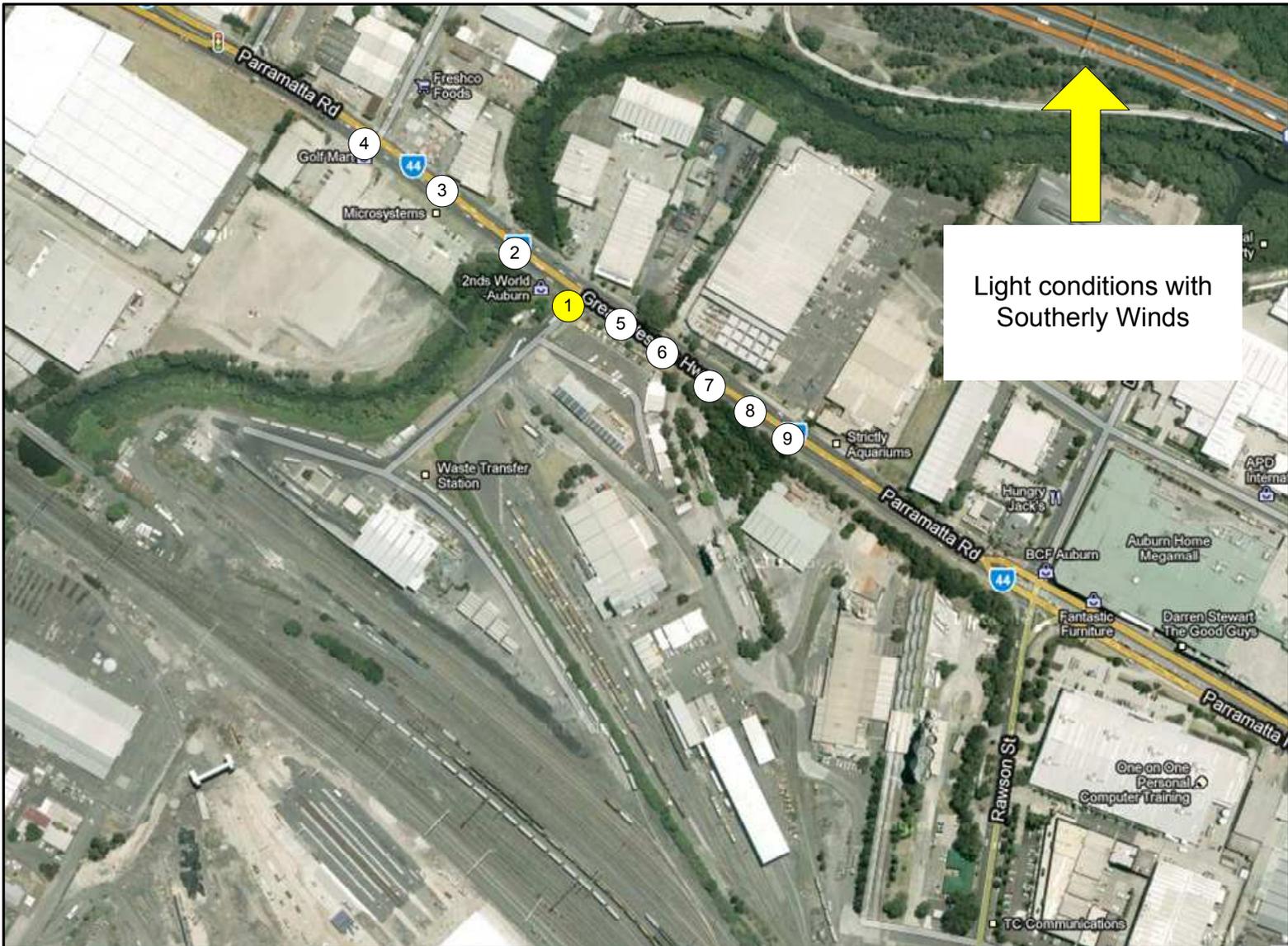
### Additional Items

1. Installation sprayed for insects.
2. Weeds and bush trimmed.



## **Appendix C –**

### **FAOA Plot and Field Sheets**



Light conditions with Southerly Winds

DESCRIPTION  
**Field Ambient Odour Assessment Survey**  
 Modified German Standard VDI 3940

- LEGEND  
 German Intensity Scale VDI3882
- 0 Not detectable
  - 1 Very weak
  - 2 Weak
  - 3 Distinct
  - 4 Strong
  - 5 Very strong
  - 6 Extremely strong



CLIENT/PROJECT

**Veolia Environmental Services**  
 Clyde Transfer Terminal, Clyde NSW  
 Field Ambient Odour Assessment Survey

Date: 17/05/2011  
 Time: 1140-1215

 THE ODOUR UNIT PTY LTD  
 Aust Tech Park, Locomotive Workshop,  
 Suite 16012, 2 Locomotive Street,  
 EVELEIGH, NSW 2015  
 Phone: (02) 9209 4420 – Fax: (02) 9209 4421

DRAWN BY	M.ASSAL	17/05/2011
CHECKED	J. SCHULZ	17/05/2011
APPROVED	T. SCHULZ	17/05/2011

**Veolia Environmental Services**  
 Field Ambient Odour Assessment

DRAWING No.  
 N1473-XVII  
 JOB No.  
 N1473L

# THE ODOUR UNIT PTY LIMITED



Australian Technology Park Phone: +61 2 9209 4420  
 Locomotive Workshop Facsimile: +61 2 9209 4421  
 Suite 16012 Email: [tschulz@odourunit.com.au](mailto:tschulz@odourunit.com.au)  
 2 Locomotive Street Internet: [www.odourunit.com.au](http://www.odourunit.com.au)  
 Eveleigh NSW 2015 ABN: 53 091 165 061

## Form 22 - Field Ambient Odour Assessment Log Sheet

DATE: 17/05/2011 ASSESSOR: Terry Schulz WEATHER CONDITIONS: Lights conditions with Sortherly winds

GRID REF. POSITION	TIME	WIND DIRECTION	WIND SPEED (m/s)	ODOUR PRESENT Y / N	ODOUR CHARACTER	VDI 3940 INTENSITY SCALE 0-6	COMMENTS
1	1140	S	0.5-2	Y	Municipal Solid Waste	1	Intermittent
2	1145	S	0.5-2	N	-	0	-
3	1149	S	0.5-2	N	-	0	-
4	1153	S	0.5-2	N	-	0	-
5	1201	S	0.5-2	N	-	0	-
6	1205	S	0.5-2	N	-	0	-
7	1209	S	0.5-2	N	-	0	-

# THE ODOUR UNIT PTY LIMITED



Australian Technology Park Phone: +61 2 9209 4420  
Locomotive Workshop Facsimile: +61 2 9209 4421  
Suite 16012 Email: [tschulz@odourunit.com.au](mailto:tschulz@odourunit.com.au)  
2 Locomotive Street Internet: [www.odourunit.com.au](http://www.odourunit.com.au)  
Eveleigh NSW 2015 ABN: 53 091 165 061

GRID REF. POSITION	TIME	WIND DIRECTION	WIND SPEED	ODOUR PRESENT Y / N	ODOUR CHARACTER	VDI 3940 INTENSITY SCALE 0-6	COMMENTS
8	1212	S	0.5-2	N	-	-	0
9	1215	S	0.5-2	N	-	-	0