PSA CONSULTING

Baiada Poultry Pty. Ltd.
Proposed Poultry Processing Facility
Odour Impact Assessment

Oakburn, NSW

Final Report

June 2019

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1 INTRODUCTION

1.1 BACKGROUND

The Odour Unit Pty Ltd (**TOU**) was commissioned by PSA Consulting (Australia) Pty Ltd (**PSA**) on behalf of Baiada Poultry Pty. Ltd. (**Baiada**) to carry out an odour impact assessment for the proposed integrated poultry processing facility (**PPF**) to be sited adjacent to the Oakburn Protein Recovery Plant (**PRP**) near Oxley Highway, Westdale NSW (Lot 100 on DP1097471), see **Figure 1.1**. The proposed PPF is to replace the existing abattoir located at Out St, Tamworth.

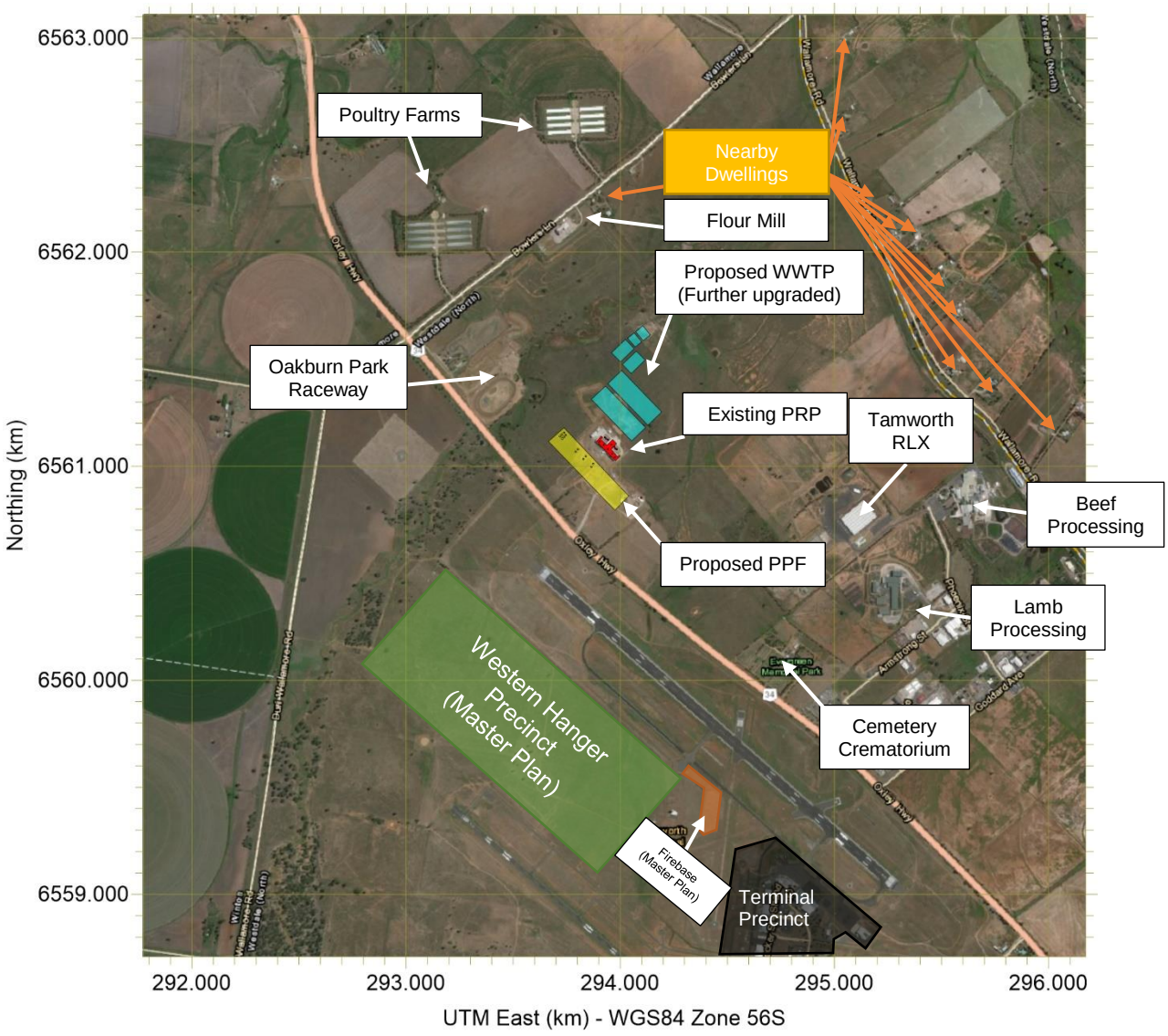


Figure 1.1: Site location and surrounds.

The aim of this odour impact assessment is to address key issues raised in the Department of Planning & Environment **(DPE)** *Planning Secretary's Environmental Assessment Requirements (***SEARs***), Baiada Oakburn Poultry Processing Facility (SSD 9394)* document. The key issues in the SEARs were related to potential impacts of the proposed PPF and measures to avoid, mitigate, manage and/or offset impacts.

The specific matters to be addressed specific to odour impacts in the SEARs include:

- *"a quantitative odour and air quality impact assessment in accordance with the relevant Environment Protection Authority (EPA) guidelines. This assessment must include:*
    - *an investigation and assessment of odour impacts on all identified and potential receivers including, but not limited to, the adjacent rural residences and the Tamworth Regional Airport;*
    - *an assessment of the cumulative air quality and odour impacts of the development, taking into account existing and proposed livestock intensive industries in the surrounding area;*
    - *evidence of appropriate meteorological data for use in air dispersion modelling, using real meteorological data where possible;*
    - *inclusion of 'worst case' emission scenarios and sensitivity analyses;*
    - *a contingency plan to address unpredicted operational odour impacts;*
    - *a description and appraisal of air quality and odour impact monitoring, emission control techniques and mitigation measures."*

It is proposed to operate a child care centre on-site. Odour impacts have been considered as recommended by *Child Care Planning Guideline – Delivering quality child care for NSW, 2017*. Consideration C28 of this guideline states:

> *"A suitably qualified air quality professional should prepare an air quality assessment report to demonstrate that proposed child care facilities close to major roads or industrial developments can meet air quality standards in accordance with relevant legislation and guidelines".*

Furthermore, Environment Protection Authority (**EPA**) key information requirements (notice number 1566238) also include:

> *"an adequate assessment of dust generated and management of potential impacts on adjacent rural residences during the construction and operational phases"*

Dust impact potential is addressed in **Section 1.5**

This report contains the methodology, results and findings of the odour impact assessment.

1.2 SITE SURROUNDS

Nearest sensitive places include Oakburn Park Raceway, Tamworth Regional Livestock Exchange (**TRLX**), and Tamworth Regional Airport. Other nearby sensitive places include dwellings along Wallamore Road and Bowlers Lane, and a cemetery-crematorium. Surrounding land uses include beef processing, lamb processing, poultry farming and flour milling, see **Figure 1.1**.

The near-field topography surrounding the site could be described as a flat rural floodplain. Further afield there is a slightly elevated ridgeline that runs along Bowlers Lane from the north to the southwest. The Peel River valley is to the northeast.

1.3 SITE PLAN

The Oakburn PPF is to be located immediately to the south west of the current Oakburn PRP building at Oxley Highway, Westdale NSW (Lot 100 on DP1097471). See Figure 1.2 and **Appendix A**.

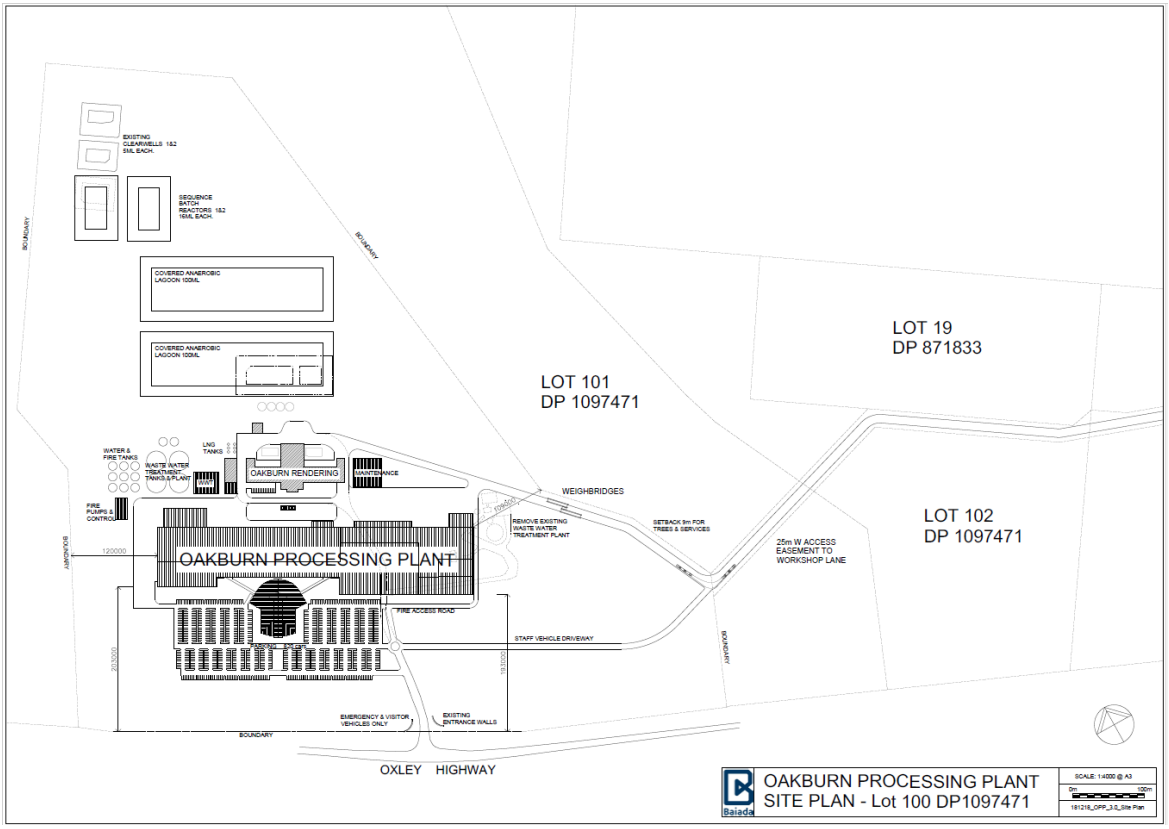


Figure 1.2: Proposed PPF Site plan

1.4 OAKBURN PROPOSED POULTRY PROCESSING FACILITY DESCRIPTION

The proposed PPF has been described by Baiada in their request for SEARs (Boulton & Ireland, 2018):

> *"Baiada is proposing a new, integrated poultry processing plant on the site consisting of the following items:*

- *Construction of an integrated poultry processing plant consisting of:*
    - *36,000 m^2 of Gross Floor Area providing for live bird storage, processing, chilling, cold store and distribution facilities;*
    - *1,600 m^2 workshop and store building;*
    - *4,100 m^2 of ancillary administration, staff amenities and childcare space;*
    - *Expanded Waste Water Treatment Plant; and*
    - *Installation of ancillary infrastructure, landscaping and services.*
- *Increase the approved level of poultry processing on the site to a maximum of 3 million birds per week;*
- *Increase production at the existing rendering plant to a maximum of 1,680 tonnes of finished product per week (240 tonnes / day 7 days a week); and*
- *Operation of all aspects of the site facility up to 24 hours per day, 7 days a week with no restrictions."*

The potential key odour emission sources from the proposed PPF and an on-site sensitive receiver have been described in the following sub-sections

1.4.1 Proposed PPF Odour Sources

Key odour sources assumed for the proposed PPF derived from the floor plan shown in **Figure 1.3** are:

- Live bird handling ventilation; and
- Primary processing line ventilation including but not limited to:
    - De-feathering rooms,
    - Evisceration rooms, and
    - Air chiller rooms.

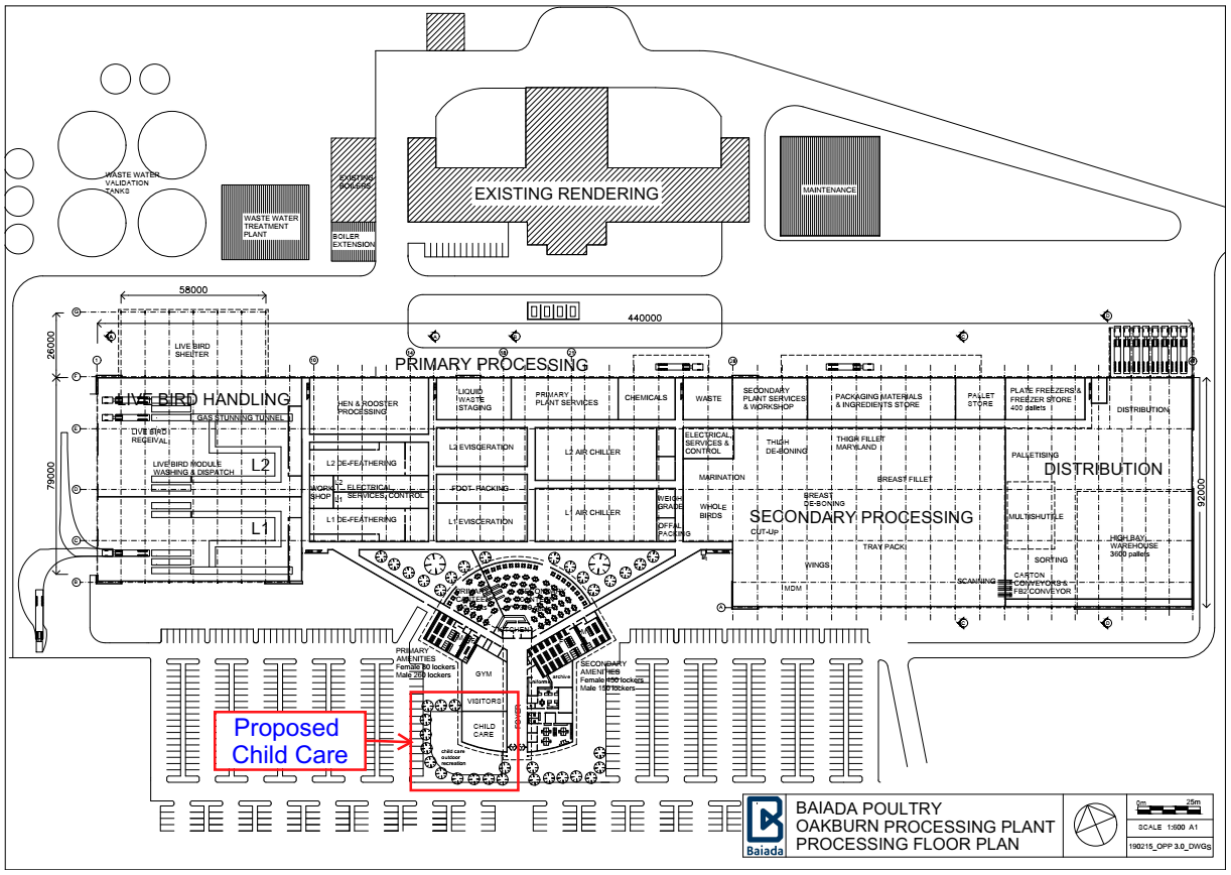


Figure 1.3: Proposed PPF Floor Plan (dwg no.: 190215_OPP_3.0_DWGS)

1.4.2 Ancillary Child Care Centre

It is proposed to operate a child care centre on-site at the location indicated on **Figure 1.3.**

1.4.3 WWTP Odour Sources

A proposed WWTP concept design report was compiled in February 2018 by JJC Engineering Pty Ltd that proposed construction in two stages (JJC Engineering Pty Ltd, 2018). For Stage One, the wastewater would continue to be screened within the PRP before being discharged to the existing Balance Tank and Condensate Tank. From the Balance tank and Condensate Tank the liquid would be pumped to the proposed waste water treatment plant where it is initially treated in a 25 ML Covered Anaerobic Lagoon (CAL) before being polished in a 5 ML Sequencing Batch Reactor (SBR). The liquid is discharged into two 5 ML Clear Wells (CW) before discharge to sewer. An odour impact assessment for the Stage One upgrade was completed by TOU in March 2018 (Hayes & Munro, 2018).

It was inferred from the supplied Proposed PPF Site Plan (**Figure 1.4**) that the Stage Two WWTP construction would involve that:

- the two 5 ML CWs be retained,
- the 5 ML SBR be replaced with two larger 16 ML SBRs; and
- the 25 ML CAL be replaced with two larger 100 ML CALs.

The odour impact from Stage Two is has been assessed in this report.

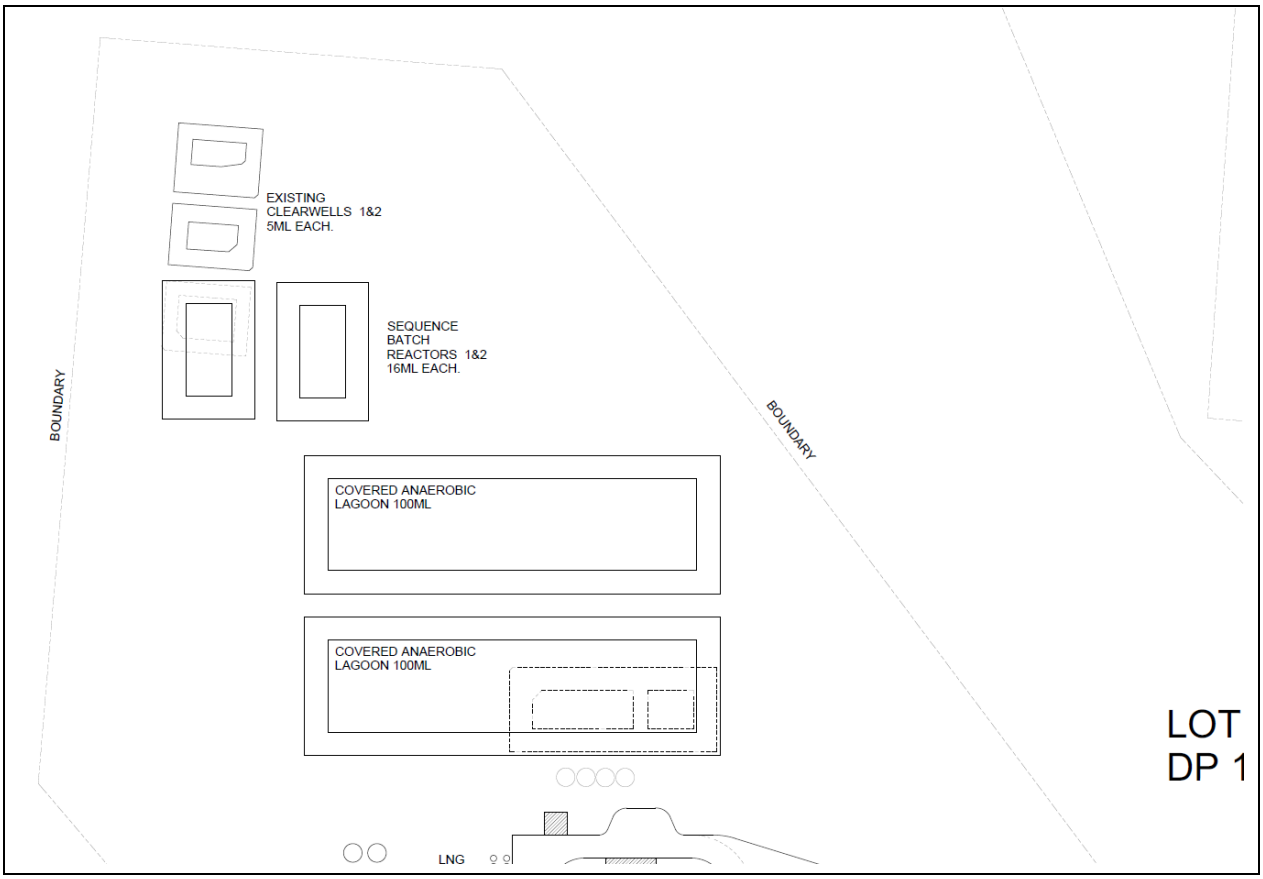


Figure 1.4: Proposed Stage Two WWTP Site Plan (dwg no.: 181218_OPP_3.0_Site Plan)

1.4.4 Existing Protein Recovery Plant Odour Sources

The odour sources assumed for the existing PRP are the same as those used for the previous TOU odour impact assessment report for the Stage One WWTP upgrade (Hayes & Munro, 2018). The PRP odour sources assessed were:

- High Temperature
    - Processing, and
    - Storage/dispatch;
- Low Temperature

- Processing; and
- Storage/dispatch;

- Raw materials receival area/loading bay;
- High temperature processing biofilter; and
- Low temperature processing biofilter.

Fugitive (non-biofilter) odour emissions from the PRP building were updated from measurements taken by TOU on 8 August 2018.

1.5 POTENTIAL FOR DUST IMPACTS

Based on TOU's experience with poultry processing facilities across Australia, processing, rendering and wastewater sources are high in moisture and low in particulate emissions and are unlikely to be problematic. It is inferred from the low odour concentrations measured from live bird storage at the Out Street facility that the particulate levels will be correspondingly low given the accepted nexus between odour and dust across many industries.

Given that:

- the nature of all processing, rendering and wastewater sources of the proposed facility are not high risk (compared with, for example, feed mills);
- the sealing of site carparks and roadways; and
- the large separation distance to the nearest rural residential dwelling, being located over 1.1 km to the north of the processing plant structure, and the rest being over 1.5 km away;

it is TOU's judgement that the risk level of adverse dust impact is of very low potential; and that a refined quantitative assessment is not required.

2 METHODOLOGY

2.1 EMISSIONS INVENTORY

The odour emission rates used in the modelling scenarios are shown in the following sections. Odour Concentration Measurement Reports and odour emission rate calculation tables are available in **Appendix B**.

2.1.1 Point Sources

2.1.1.1 PRP Biofilter

The biofilter cells were modelled as individual low exit velocity, wide diameter and wake-affected point sources. The stack source release parameters and odour emission rates are given in **Table 2.1**.

The treated odour level exiting the PRP biofilters is expected to range from a mean of 200 odour units (ou) upon commissioning to a mean of 500 ou as the medium degrades. The PRP biofilters were modelled based upon the 1,000 ou used for the 2016 MWH report *Odour Impact Assessment for Baiada Poultry Pty Limited's Oakburn Rendering Plant* (Boddy, 2016).

2.1.1.2 PPF Live Bird Ventilation

The PPF live bird storage area ventilation ducts were modelled using an odour emission factor of 0.35 ou.m^3/s.bird measured by TOU on 8 August 2018 from the Baiada, Out St live bird storage area. The ventilation rate used was 900,000 m^3/h based upon a design factor of 10 m^3/h per bird and a maximum capacity of 90,000 birds. Birds were assumed to be present between 2am and 9pm.

As a worst-case scenario, a sensitivity test was performed to determine the effect of multiplying the live bird emissions by a factor of three (i.e. 1.05 ou.m^3/s.bird).

2.1.1.3 PPF Ventilation

The PPF ventilation ducts were modelled using odour emission rate data collected by TOU on 16 November 2011 from Baiada's Hanwood poultry processing facility (Munro & Hayes, 2018). The ventilation rate was nominally increased by 50% per vent for the PPF. Therefore, the flow per vent used was 22,000 m^3/h totalling six vents and 132,000 m^3/h. The discharge odour concentration used was the mean measured value of 220 ou from the Hanwood vents. The processing line was assumed to be under operation between 5am and 8pm.

Table 2.1: Point source release parameters and odour emission rates - Protein Recovery Plant								
Source	**I.D.**	**Stack Height (m)**	**Exit Temp. (^{0}C)**	**Exit Diameter (m)**	**Empty Bed Exit Velocity (m/s)**	**Design Flow Rate (m^3/s)**	**Odour Emission Rate ($ou.m^3/s$)**	**Peak odour emission rate P/M60 near-field ($ou.m^3/s$)**
High Temperature Processing Biofilter One - Cell One	BF1a	2	40	8.3	0.05	2.78	1,389	3,194
High Temperature Processing Biofilter One - Cell Two	BF1b	2	40	8.3	0.05	2.78	1,389	3,194
High Temperature Processing Biofilter One - Cell Three	BF1c	2	40	8.3	0.05	2.78	1,389	3,194
Low Temperature Process Biofilter One - Cell One	BF2a	2	40	8.3	0.05	2.78	1,389	3,194
Low Temperature Process Biofilter One - Cell Two	BF2b	2	40	8.3	0.05	2.78	1,389	3,194
Low Temperature Process Biofilter One - Cell Three	BF2c	2	40	8.3	0.05	2.78	1,389	3,194

Table 2.2: Point source release parameters and odour emission rates - Poultry Processing Plant								
Source	**I.D.**	**Stack Height (m)**	**Exit Temp. (^{0}C)**	**Exit Diameter (m)**	**Empty Bed Exit Velocity (m/s)**	**Design Flow Rate (m^3/s)**	**Odour Emission Rate ($ou.m^3/s$)**	**Peak odour emission rate P/M60 near-field ($ou.m^3/s$)**
Live Bird Ventilation - Vent 1	LB1	13	20	1.88	15	1.75	0.35 /bird	0.80 /bird
Live Bird Ventilation - Vent 2	LB2	13	20	1.88	15	1.75	0.35 /bird	0.80 /bird
Live Bird Ventilation - Vent 3	LB3	13	20	1.88	15	1.75	0.35 /bird	0.80 /bird
Live Bird Ventilation - Vent 4	LB4	13	20	1.88	15	1.75	0.35 /bird	0.80 /bird
Live Bird Ventilation - Vent 5	LB5	13	20	1.88	15	1.75	0.35 /bird	0.80 /bird
Live Bird Ventilation - Vent 6	LB6	13	20	1.88	15	1.75	0.35 /bird	0.80 /bird
Processing Ventilation - Vent 1	EV1	13	0	0.72	15	1.75	1,464	3,366
Processing Ventilation - Vent 2	EV2	13	0	0.72	15	1.75	1,464	3,366
Processing Ventilation - Vent 3	DF1	13	0	0.72	15	1.75	1,464	3,366
Processing Ventilation - Vent 4	DF2	13	0	0.72	15	1.75	1,464	3,366
Processing Ventilation - Vent 5	AC1	13	0	0.72	15	1.75	1,464	3,366
Processing Ventilation - Vent 6	AC2	13	0	0.72	15	1.75	1,464	3,366

2.1.2 Area Sources

2.1.2.1 Waste Water Treatment Plant

The WWTP area sources, except for the CALs, have been modelled using data collected from the Baiada Hanwood WWTP.

For the proposed CALs, an odour emission rate was derived from TOU's database. In the absence of relevant data from a poultry processing plant, a maximum emission rate from an uncovered anaerobic pond servicing a red meat abattoir was used for this application. The red meat abattoir utilised a similar wastewater process with an SBR and settling ponds downstream of the uncovered anaerobic pond. The biogas capture rate from the proposed CALs was assumed to be 99.9%.

The proposed phasing of the SBR cycles was modelled under the assumption that filling during night time hours would be avoided. As a worst-case scenario, the SBR was set at the fill emission rate for daytime hours between 8am and 5pm with the aeration and settling emission rates set overnight. It is understood in practise that the fill phase should only take approximately one hour followed by the aeration and settling phases.

The area source odour emission rates are shown in **Table 2.3**.

Table 2.3: Area source odour emission rates								
Source	**I.D.**	**Initial Vertical Spread (m)**	**Height (m)**	**Surface Area (m^2)**	**Specific Odour Emission Rate ($ou.m^3/m^2/s$)**	**Odour Emission Rate ($ou.m^3/s$)**	**Specific Odour Emission Rate P/M60 2.5 ($ou.m^3/m^2/s$)**	**Specific Odour Emission Rate P/M60 2.3 ($ou.m^3/m^2/s$)**
Covered Anaerobic Lagoon 1	CAL1	1	0	24,004	0.0518	1,243	0.130	0.119
Covered Anaerobic Lagoon 2	CAL2	1	0	24,450	0.0518	1,267	0.130	0.119
SBR1 - Fill	SBR1	1	0	5,345	3.89	20,792	9.72	8.95
SBR1- Aeration (start of cycle)	SBR1	1	0	5,345	0.224	1,197	0.560	0.515
SBR1 - Aeration (middle of cycle)	SBR1	1	0	5,345	0.082	438	0.205	0.189
SBR1 - Aeration (end of cycle)	SBR1	1	0	5,345	0.030	160	0.075	0.069
SBR1 - Settling/Decant	SBR1	1	0	5,345	0.018	96	0.045	0.041
SBR2 – Fill	SBR2	1	0	5,311	3.89	20,660	9.72	8.95
SBR2 - Aeration (start of cycle)	SBR2	1	0	5,311	0.224	1,190	0.560	0.515
SBR2 - Aeration (middle of cycle)	SBR2	1	0	5,311	0.082	436	0.205	0.189
SBR2 - Aeration (end of cycle)	SBR2	1	0	5,311	0.030	159	0.075	0.069
SBR - Settling/Decant	SBR2	1	0	5,311	0.018	96	0.045	0.041
Clear Well 1	CW1	1	0	2,360	0.141	333	1.30	1.19
Clear Well 2	CW2	1	0	2,168	0.141	306	1.30	1.19

2.1.3 Volume Sources

2.1.3.1 Protein Recovery Plant

Fugitive odour emissions from the PRP have been calculated from actual measurements collected from the building by TOU on 8 August 2018.

Five volume sources were input into the model to represent the ridgeline vent discharge from each major section of the structure with odour emission rates proportionally assigned by estimated volume of each section. The volume source settings within the model has taken into account that emissions discharge from the ridgeline is immediately downwashed into the structure's wake. As a conservative measure, the theoretical maximum production rates have been used (i.e. 24 hours, 7 days per week). The volume source release parameters are available in **Table 2.4**.

The relatively low OER values for the Low Temperature and High Temperature Processing and Storage areas reflect the excellent odour capture experienced during the August 2018 testing, arising from the fully-enclosed nature of the rendering processes.

Table 2.4: Volume source odour emission rates						
Source	**I.D.**	**Height (m)**	**Horizontal Spread (m)**	**Vertical Spread (m)**	**Odour Emission Rate ($ou.m^3/s$)**	**Peak odour emission rate P/M60 2.3 ($ou.m^3/s$)**
High Temperature - Storage	HTST	6.4	5.2	6.0	84	193
High Temperature Processing	HSPR	6.4	5.2	6.0	390	897
Low Temperature - Storage	CSST	6.4	5.2	6.0	84	193
Low Temperature Processing	CSPR	6.4	5.2	6.0	540	1,242
Raw Materials Receival Area/Loading Bay	LB	7.2	7.4	6.7	4,562	10,493
WWTP DAF	DAF	3.5	3.2	3.3	8,890	20,447

2.1.4 Cumulative odour impacts

The cumulative odour impacts from the proposed PPF have been assessed by combining all odour sources into one grouped impact and separately grouped by origin: PRP, PPF and WWTP. In TOU's experience, multiple odour plumes of distinctly different odour characters do not combine in the atmosphere and tend to be observed as individually identifiable odour characters in the field, even well downwind of the sources. Furthermore, treated odour emissions from an effective biofilter remove almost all process odour, having an earthy, vegetative odour character. In TOU's opinion, odour impacts from biofilters and other proven odour control systems should be modelled as a non-cumulative impact.

In TOU's opinion, it is possible for odour impacts from the proposed PPF to significantly cumulate with impacts from nearby livestock intensive industries only if the projected odour footprint from the proposed PPF overlaps with their activity boundaries.

2.2 NSW ODOUR CRITERIA AND DISPERSION MODEL GUIDELINES

- NSW EPA, 2016, *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Environment Protection Authority, 2017);
- NSW EPA, 2006, *Technical framework (and notes): assessment and management of odour from stationary sources in NSW* (Environment Protection Authority, 2006a & b)*;* and
- Barclay and Scire, 2011, Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia' (Barclay & Scire, 2011)

The documents specify that the odour modelling for Level 3 impact assessments upon which this study has been conducted be based on the use of:

- 99.0th percentile dispersion model predictions;
- 1-hour averaging times with built-in peak-to-mean ratios to adjust the averaging time to a 1-second nose-response-time;
- The peak-to-mean ratios in the near-field for wake-affected point sources is 2.3;
- The peak-to-mean ratios in the near-field for volume sources is 2.3;
- The peak-to-mean ratios in the near-field for area sources is 2.5 for stability classes A to D and 2.3 for stability classes E and F;

- The near field distance is defined as typically 10 times the largest source dimension, either height or width; and

- The appropriate odour unit performance criterion based on the population of the affected community in the vicinity of the development.

The impact assessment criteria (**IAC**) for complex mixtures of odours are designed to include receptors with a range of sensitivities. Therefore, a statistical approach is used to determine the acceptable ground level concentration of odour at the nearest sensitive receptor. This criterion is determined by the following equation outlined on page 35 of NSW EPA Modelling Methods (Environment Protection Authority, 2017):

$$IAC = \frac{\log_{10}(p) - 4.5}{-0.6}$$

Equation 2.1

where:
IAC = Impact Assessment Criterion (ou)
***p* =** population

Based on **Equation 2.1**, **Table 2.5** outlines the odour performance criteria for six different affected population density categories and is reproduced from NSW EPA Modelling Methods (Environment Protection Authority, 2017). It states that higher odour concentrations are permitted in lower population density applications.

Table 2.5: Impact assessment criteria for complex mixtures of odorous air pollutants (nose response-time average, 99th percentile)

Population of affected community	Impact assessment criteria for complex mixtures of odorous air pollutants (OU)
Urban Area (≥ ~2000) and/or schools or hospitals	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤ ~2)	7.0

Source: *Table 7.5* of the NSW EPA 2016 Methods

Based on the NSW EPA classification of population densities presented in **Table 2.5** and **Equation 2.1** the IAC adopted for this odour impact assessment study is **5.0 ou**.

2.3 DISPERSION MODELLING

2.3.1 The Odour Dispersion Model

The odour dispersion modelling assessment was carried out using the CALPUFF Modelling System. The main system programs used were:

- CALPUFF - Version 7.2.1 (Level 150618)
- CALMET - Version 6.5.0 (Level 150223)
- CALPOST - Version 7.1.0 (Level 141010)

CALPUFF is a multi-layer, multi-species, non-steady-state puff dispersion model that can simulate the effects of time- and space-varying meteorological conditions on pollutant transport (Environment Protection Authority, 2017). CALMET is a meteorological model that produces three-dimensional gridded wind and temperature fields to be fed into CALPUFF. The primary output from CALPUFF is hourly pollutant concentrations evaluated at gridded and/or discrete receptor locations. CALPOST processes the hourly pollutant concentration output to produce tables at each receptor and contour plots across the modelling domain. The result is a summary of pollutant concentrations at various time averages and percentiles or a tally of hours where a pollutant has exceeded a pre-determined concentration. For further technical information about the CALPUFF modelling system refer to the document CALPUFF Modeling System Version 6 User Instructions (Atmospheric Studies Group, 2011).

The CALPUFF system can account for a variety of effects such as non-steady-state meteorological conditions, complex terrain, varying land uses, plume fumigation and low wind speed dispersion (Environment Protection Authority, 2017). CALPUFF is considered an appropriate dispersion model for air impact assessments, as outlined in the NSW EPA Modelling Methods, in one or more of the following applications:

- complex terrain, non-steady-state conditions,
- buoyant line plumes,
- coastal effects such as fumigation,
- high frequency of stable calm night-time conditions,
- high frequency of calm conditions, and
- inversion break-up fumigation conditions.

In the case of this assessment, CALPUFF was required in order to handle the moderate complexity of terrain surrounding Oakburn PRP. The terrain may induce deflection or channelling of odour plumes. Also, the high incidence of calm and very light winds (modelled 40.2% annual frequency < 2.0 m/s) and very stable night-time conditions (modelled 35.9% modelled F-class) were likely to induce non-steady-state conditions such as accumulation of odour and/or downslope movement with drainage air flow.

For this study, the air contaminant was **odour** and ground level concentrations in odour units (**ou**) have been projected.

2.3.2 Geophysical and Meteorological Configuration

A CALMET hybrid three-dimensional meteorological data file for Oakburn PRP was produced that incorporated gridded numerical meteorological data supplemented with surface observation data, topography and land use over the domain area.

2.3.3 Terrain Configuration

Terrain elevations were sourced from 1 Second Shuttle Radar Topography Mission (SRTM) Derived Smoothed Digital Elevation Model (DEM-S). The SRTM data has been treated with several processes including but not limited to removal of stripes, void filling, tree offset removal and adaptive smoothing (Gallant, et al., 2011). The DEM-S was used as input into TERREL processor to produce a 30 km by 30 km grid at 0.20 km resolution. A map of the terrain including site and meteorological station is shown in **Figure 2.1**.

2.3.4 Land Use Configuration

Land use was sourced from the United States Geological Survey (USGS) Global Land Cover Characteristics Data Base for the Australia-Pacific Region (United States Geological Survey, 1997). The data was used as input into CTGPROC processor to produce a 30 km by 30 km grid at 0.20 km resolution. A map of the land including site and meteorological station is shown in **Figure 2.2**.

2.3.5 Geophysical Configuration

The geophysical data file was created using the MAKEGEO processor. Land use data from CTGPROC and terrain data from TERREL was used as input to produce a 30 km by 30 km geophysical grid at 0.20 km resolution.

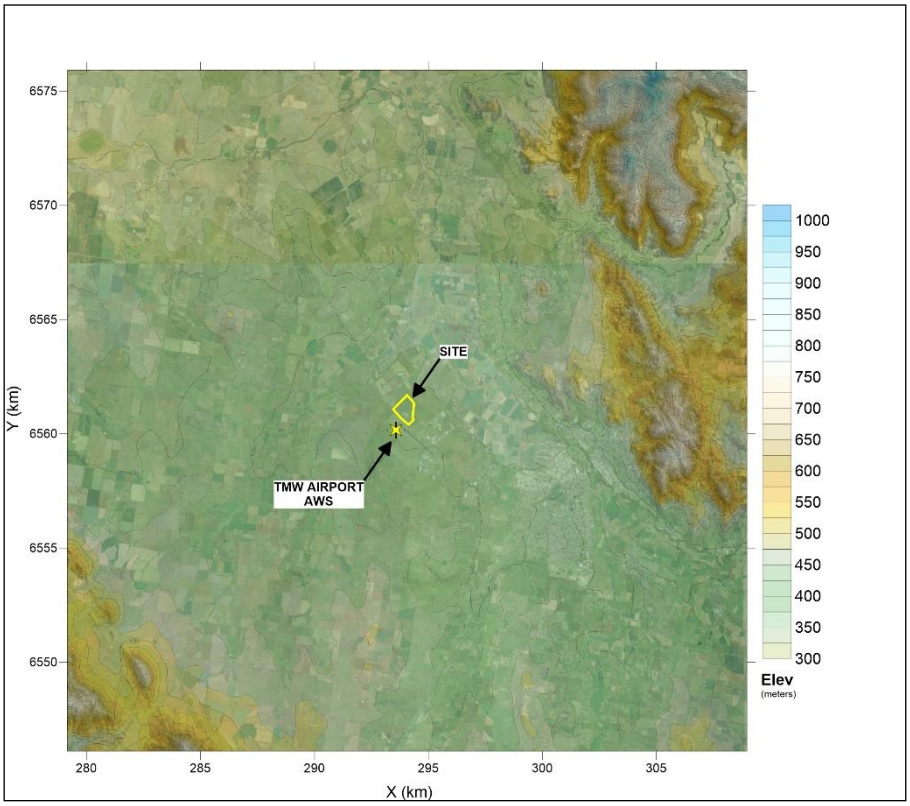


Figure 2.1: Terrain dataset of Oakburn PRP and surrounds

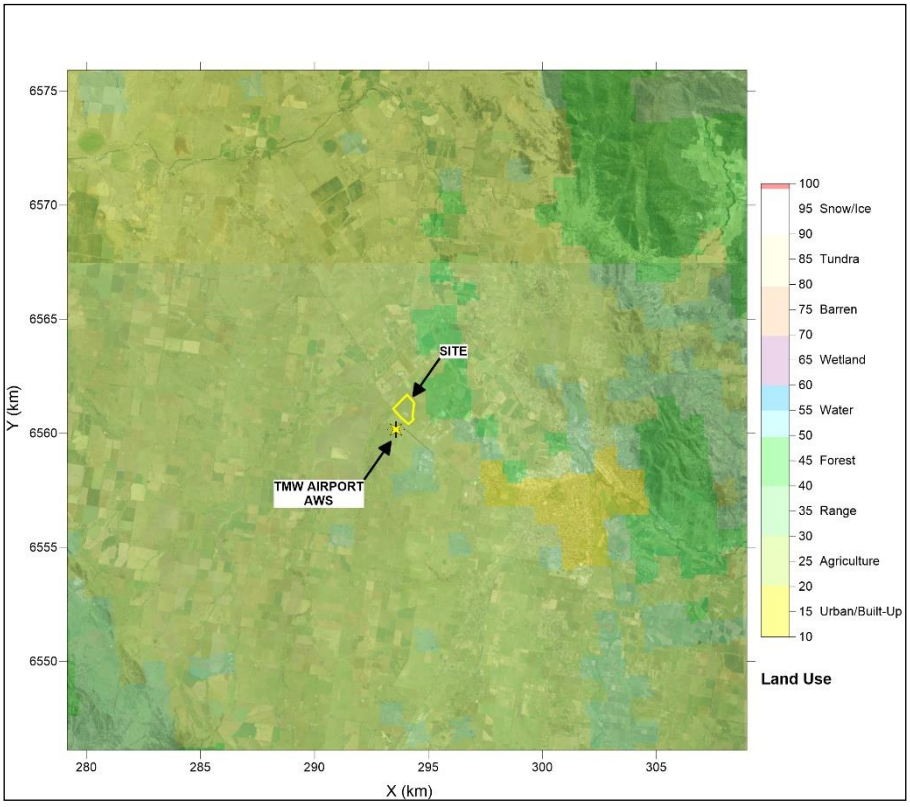


Figure 2.2: Land use dataset of Oakburn PRP and surrounds

2.3.6 Meteorological Input Data

One-hour average observed meteorological surface data for 2017 was sourced from Tamworth Airport AWS (YSTW) maintained by Bureau of Meteorology (BOM). The BOM data was formatted into a generic format and was processed with SMERGE to produce a surface meteorological data file. A small number of single hour gap-fills were carried out by interpolation.

Numerical meteorological data was produced as a 3D data tile from The Air Pollution Model (v4.0.5) and processed it with CALTAPM (v7.0.0) into a suitable format. TAPM was run using multiple nested grids—at least three nests and 35 vertical levels. The nested grid resolutions were close to a ratio of three as possible. The innermost nest was 33 km by 33 km at 1 km resolution.

2.3.7 Meteorological Model Configuration

CALMET was run with the hybrid option that uses geophysical data, surface station data and upper air data. The data was used to initialise the diagnostic functions of the CALMET module to produce a full 3D meteorology data for input into CALPUFF. **Table 2.6** shows the key variables selected.

Table 2.6: CALMET key variable fields

Grid Configuration (WGS-84 UTM Zone 56S)												
150												NX Cells
150												NY Cells
0.20												Cell Size (km)
279.073				6546.008								SW Corner (km)
11												Vertical Layers
ZFACE (m)	0	20	40	80	160	320	640	1000	1500	2000	2500	3000
LAYER	1	2	3	4	5	6	7	8	9	10	11	
MID-PT (m)	10	30	60	120	240	480	820	1250	1750	2250	2750	

Critical Wind Field Settings			
Value	**Found**	**Typical**	**Values**
TERRAD	2	None	Terrain scale (km) for terrain effects
IEXTRP	-4	4, -4	Similarity extrap. of wind (-4 ignore upper stn sfc)
ICALM	0	0	Do Not extrapolate calm winds
RMAX1	6	None	MAX radius of influence over land in layer 1 (km)
RMAX2	7	None	MAX radius of influence over land aloft (km)
R1	0.1	None	Distance (km) where OBS wt = IGF wt in layer 1
R2	0.1	None	Distance (km) where OBS wt = IGF wt aloft

2.3.8 Meteorological Data Analysis

Observed 2017 BOM surface data was compared with longer term climate (2013 – 2017) from YSTW to gauge how representative and suitable the year is for air quality

dispersion modelling. The annual wind roses (**Figure 2.3** and **Figure 2.4**) show very good agreement. The reported annual frequency of calms (< 0.5 m/s) was at 3.5% and 3.2% respectively and very light winds (0.5 – 2 m/s) occurred 22.1% and 22.8% of the time – a total frequency of 25.6% and 26.0% respectively.

The modelled meteorological surface data (**Figure 2.5**) was extracted from the nearest grid point to the YSTW location for comparison with the observed readings. The annual wind roses show acceptable correlations except for overprediction of winds from the south-south-easterly direction (20.6% compared with 15.6% recent climate) and underpredicted south-easterly direction (9.1% versus 15.5%). There was an overprediction of modelled annual frequency of calms at 4.4% and very light winds at 35.8% - a total of 40.2% (over predicted by 11 percentage points). This would have a conservative effect on the modelling, that is a positive bias towards the extent and magnitude of odour concentration projections, especially north-north-westwards from Oakburn PRP.

The monthly average (**Figure 2.6**) show that January and February were warmer in 2017 than usual, and April, July and November were cooler than the longer-term climate. The diurnal temperature (**Figure 2.7**) profile was good agreement but there are slightly warmer daytime temperatures indicated for 2017 than the longer-term climate. Diurnal mixing heights and stability class frequencies are shown in **Figure 2.8** and **Figure 2.9** respectively. Poor for odour dispersion are stable calm night-time conditions, represented within the F-class, occurring 35.9% of the hours during 2017.

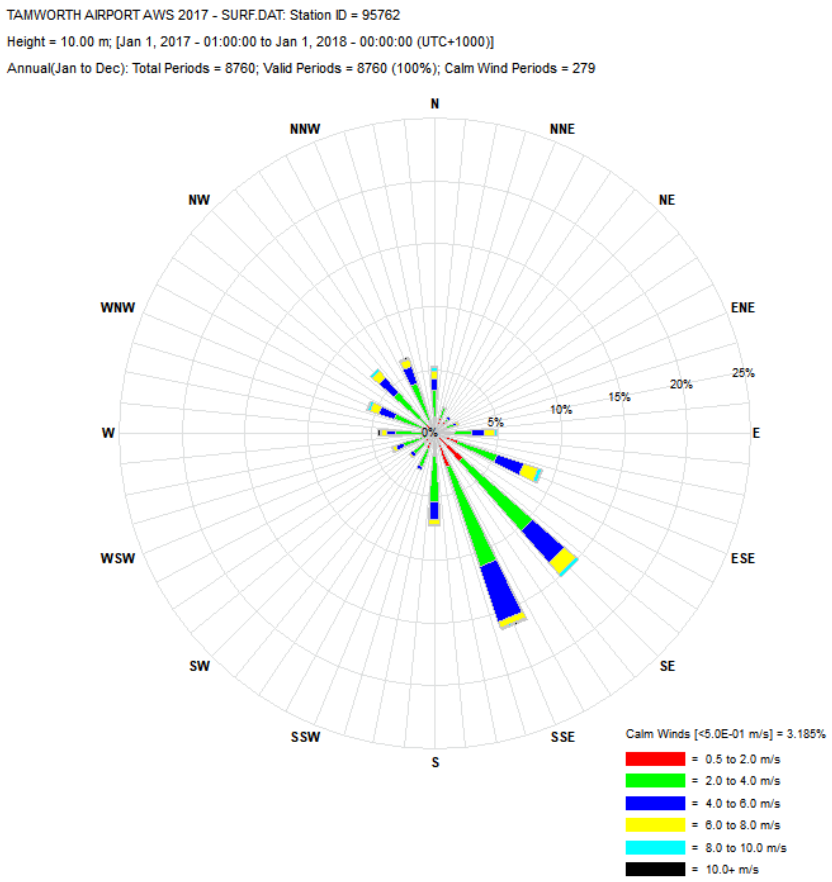


Figure 2.3: Annual wind rose for YSTW 2017

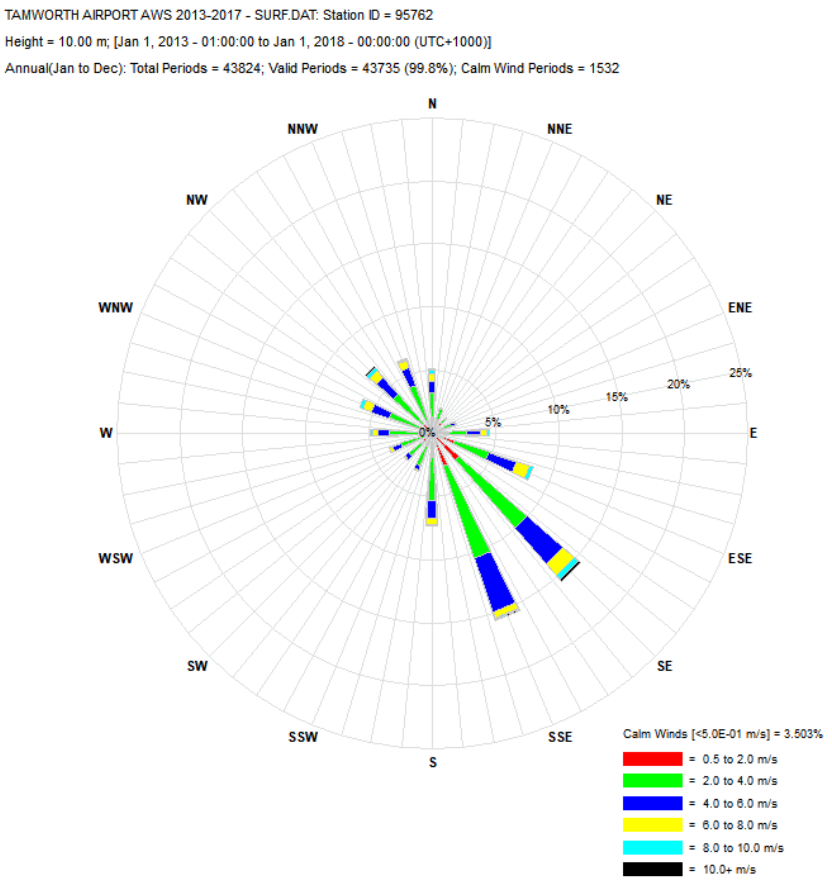
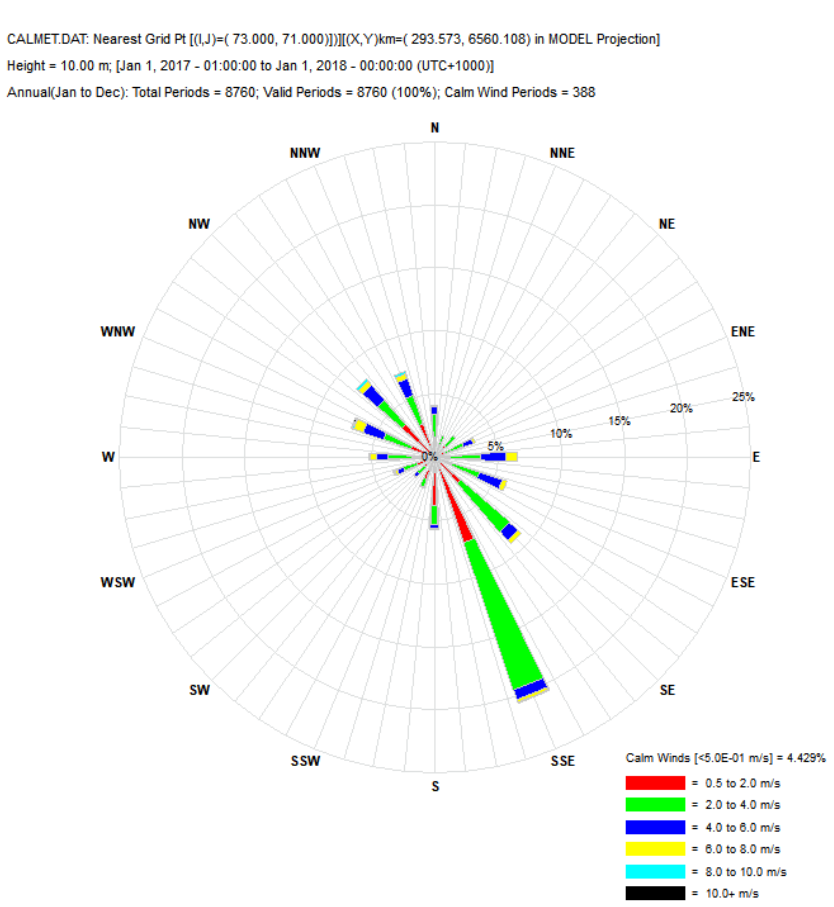
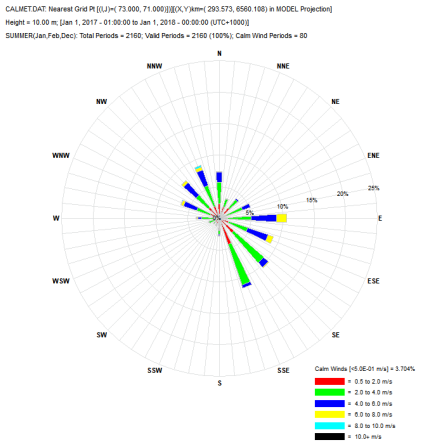


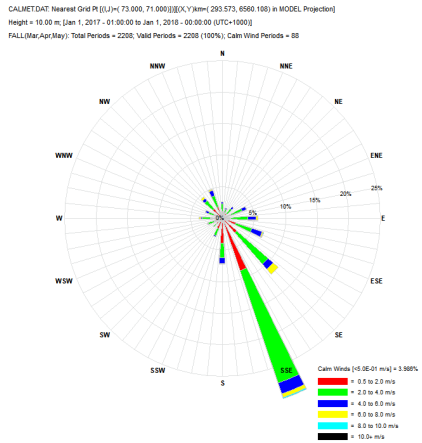
Figure 2.4: Annual wind rose for YSTW 2013-2017



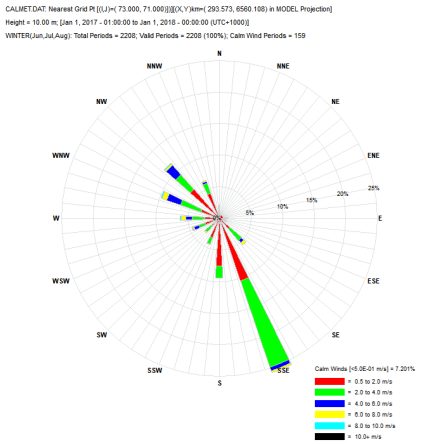
Annual



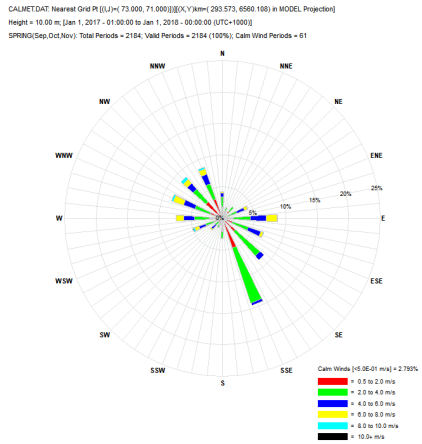
Summer



Autumn



Winter



Spring

Figure 2.5: Annual wind rose for nearest CALMET grid point to YSTW

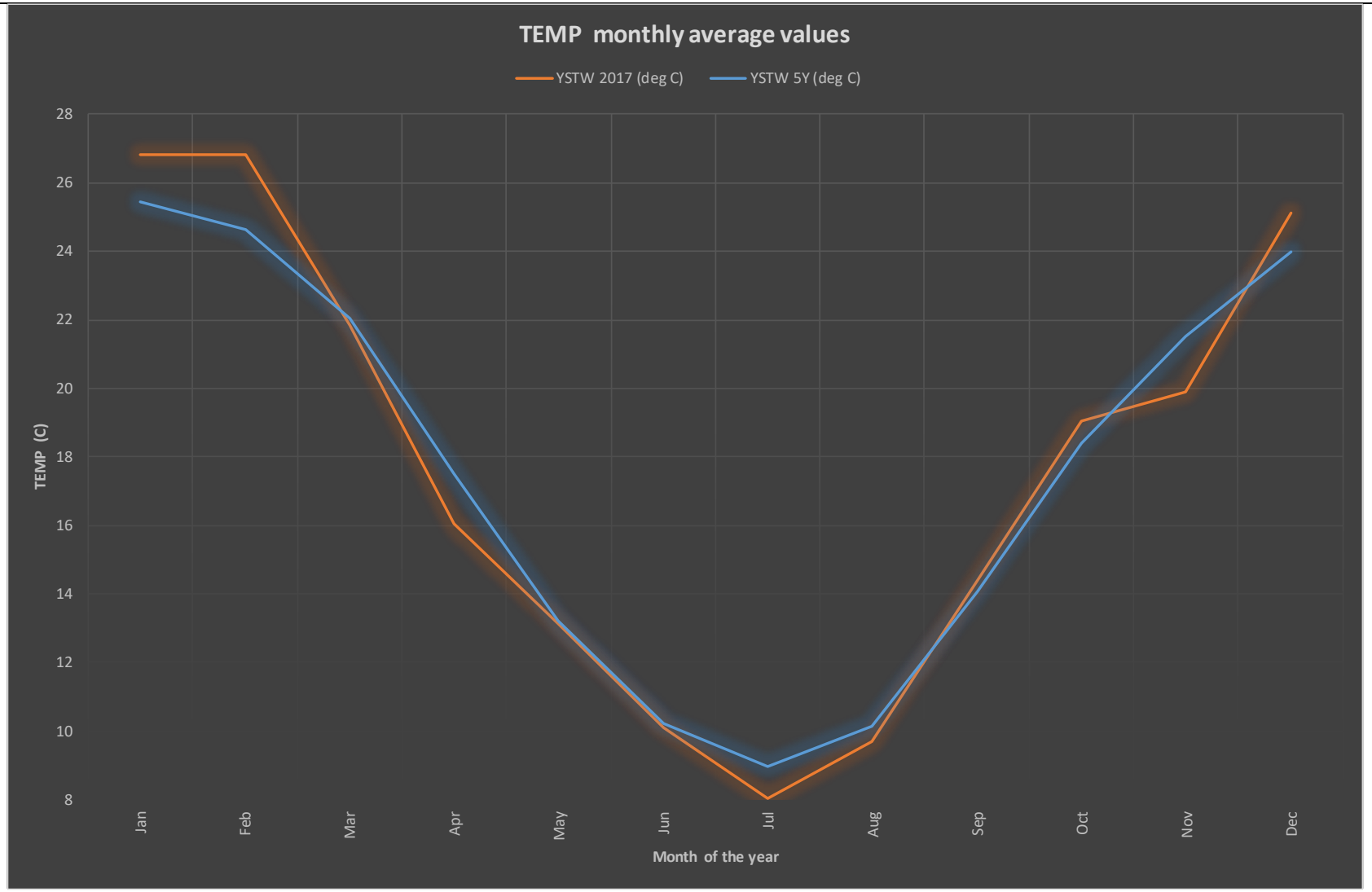


Figure 2.6: Monthly average temperatures for YSTW 2017 and recent 5-years.

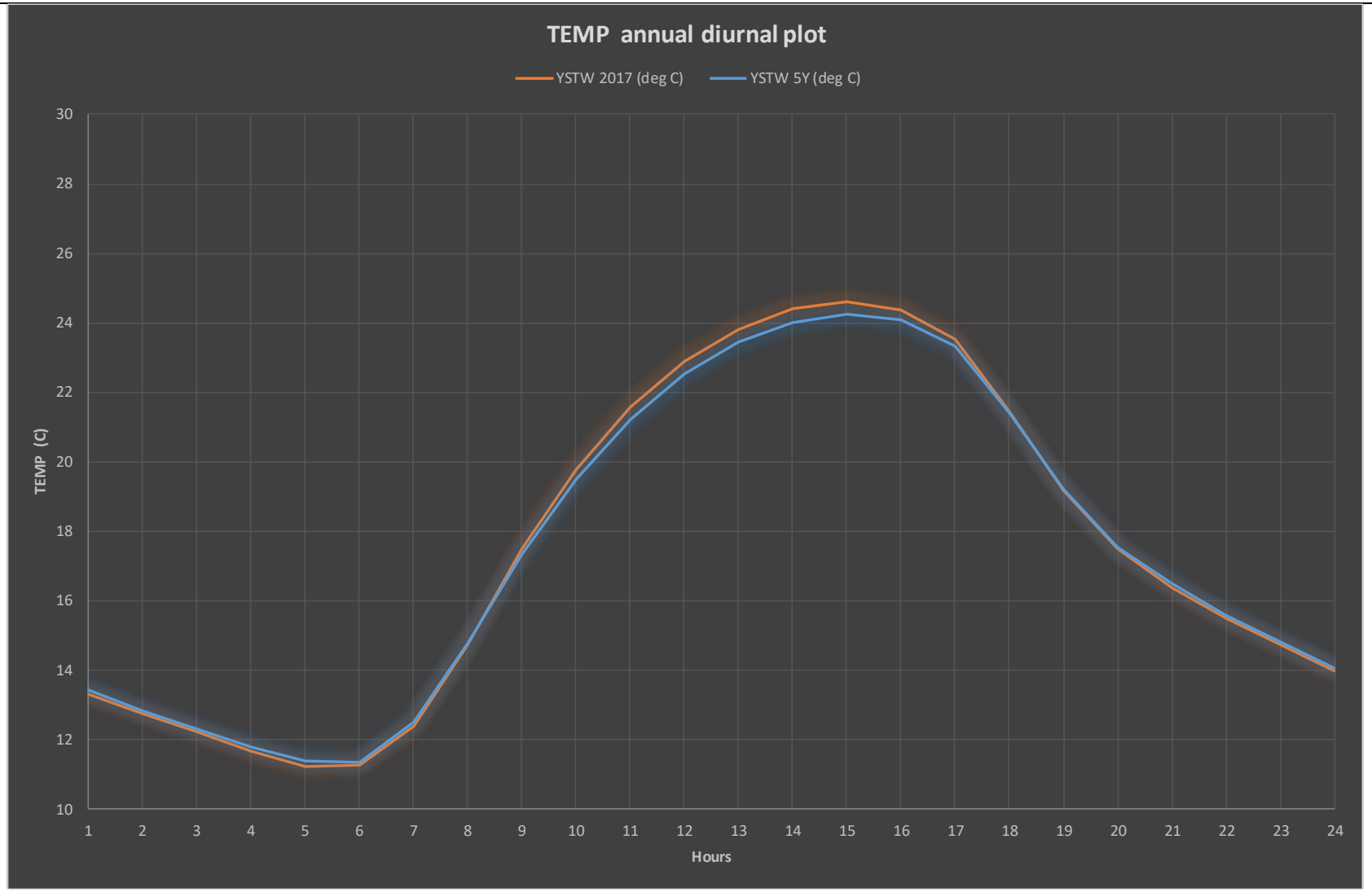


Figure 2.7: Annual diurnal temperature for YSTW 2017 and 5-years

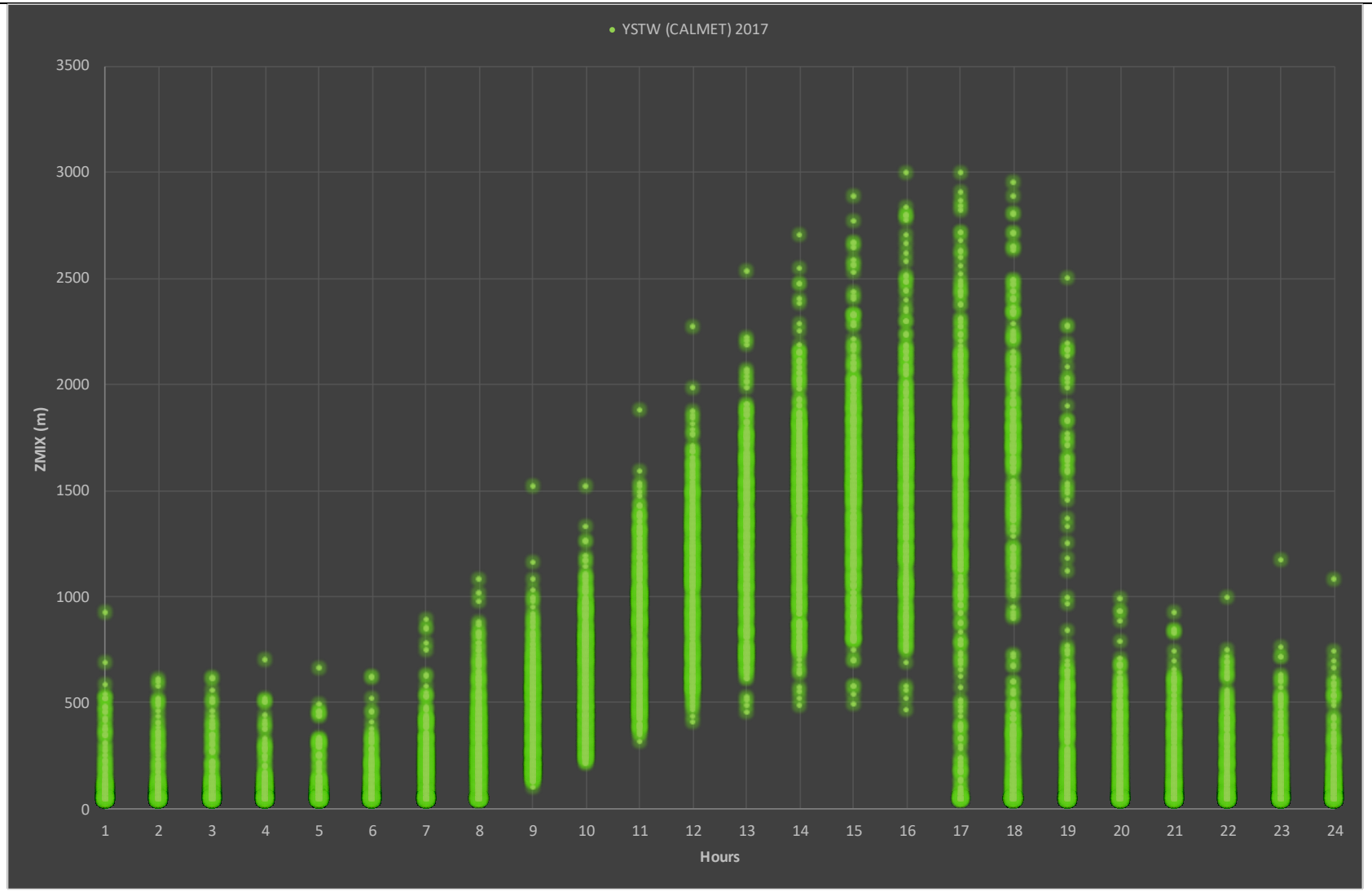


Figure 2.8: Annual X-Y scatter plot diurnal mixing height for YSTW (CALMET) 2017

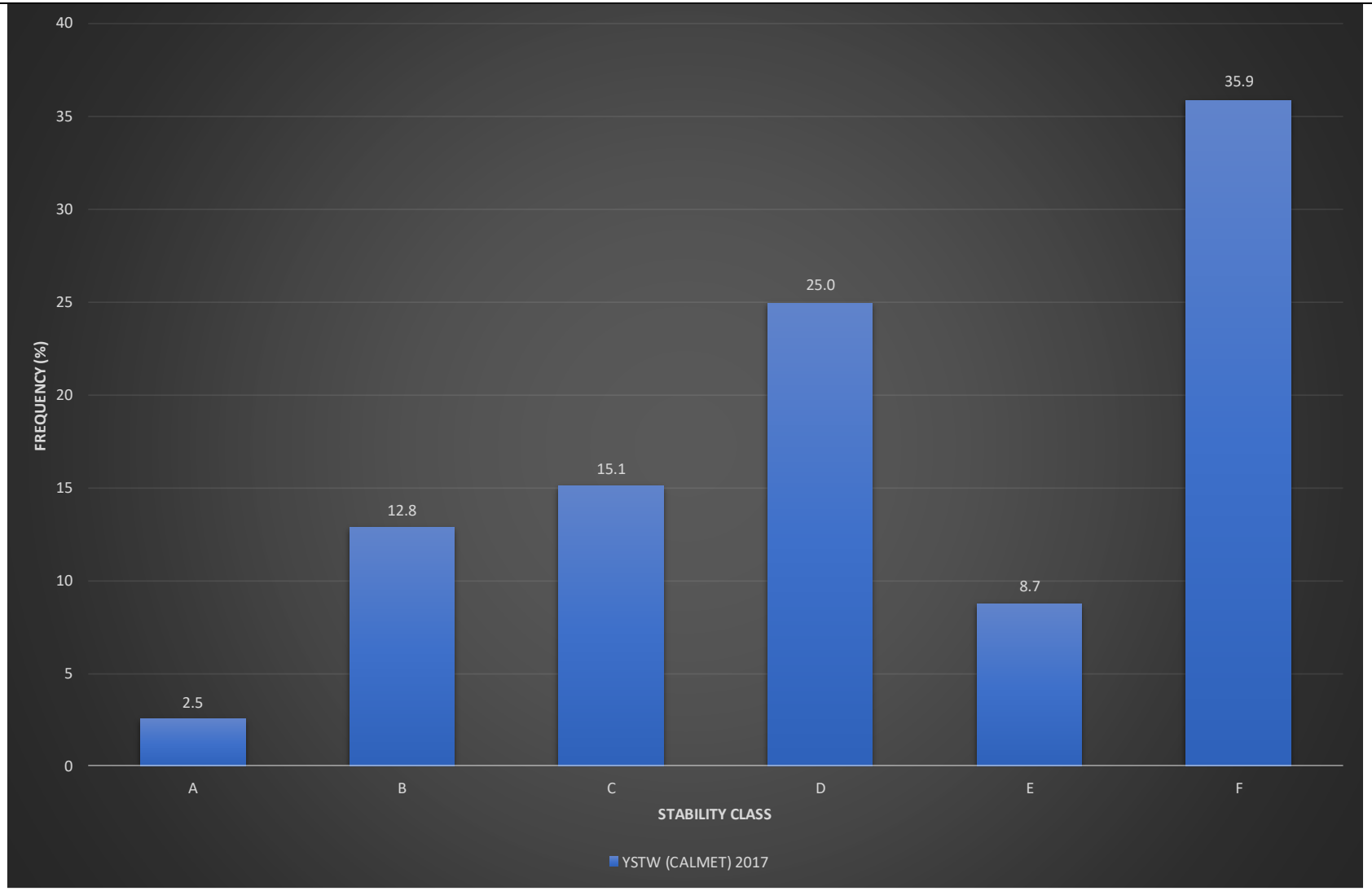


Figure 2.9: Annual stability class frequency for YSTW (CALMET) 2017

2.3.9 CALPUFF Computational Domain and Receptor Configuration

The computational domain was set at 10 km by 10 km centred over Oakburn PRP. A receptor grid was created with a 4.4 km by 4.4 km by 0.05 km spacing centred over Oakburn PRP.

For the ancillary child care centre, the 99th percentile odour concentrations were obtained from its location for both 24 hours per day operation and 12 hours per day operation (nominally from 6am to 6pm).

2.3.10 ALPUFF Source Configuration, Emission Rates and BPIP

Full odour source configurations, emission rate and BPIP details are available in **Appendix C**.

2.3.11 CALPUFF Model Options

CALPUFF default model options were set except for the following as recommended in *Table A*-4 contained and explained within *Barclay & Scire, 2011*:

- Dispersion coefficients (MDISP) = dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (2);
- Probability Density Function used for dispersion under convective conditions (MPDF) = Yes (1); and
- Minimum turbulence velocities sigma v for each stability class over land and water (SVMIN) = 0.2 m/s for A, B, C, D, E, F (0.200, 0.200, …, 0.200).

Further model configurations are available in **Appendix D.**

2.4 ODOUR DISPERSION MODELLING SCENARIOS

- Scenario 1 – Projected 5 ou (99%, 1-second) impact from all existing and proposed sources.
- Scenario 2 – Sensitivity test: Increase live bird storage emissions by a factor of three.

3 RESULTS

The odour dispersion modelling results are presented in the following figures as ground level odour concentrations, 99.0th percentile with one second nose-response-time averaging (P/M60):

Figure 3.1: All sources projected 5 ou contours:

- Yellow contour – Proposed PPF including live bird ventilation and processing lines ventilation;
- Blue contour – Stage Two upgraded WWTP;
- Red contour – existing PRP; and
- White contour - all sources cumulated.

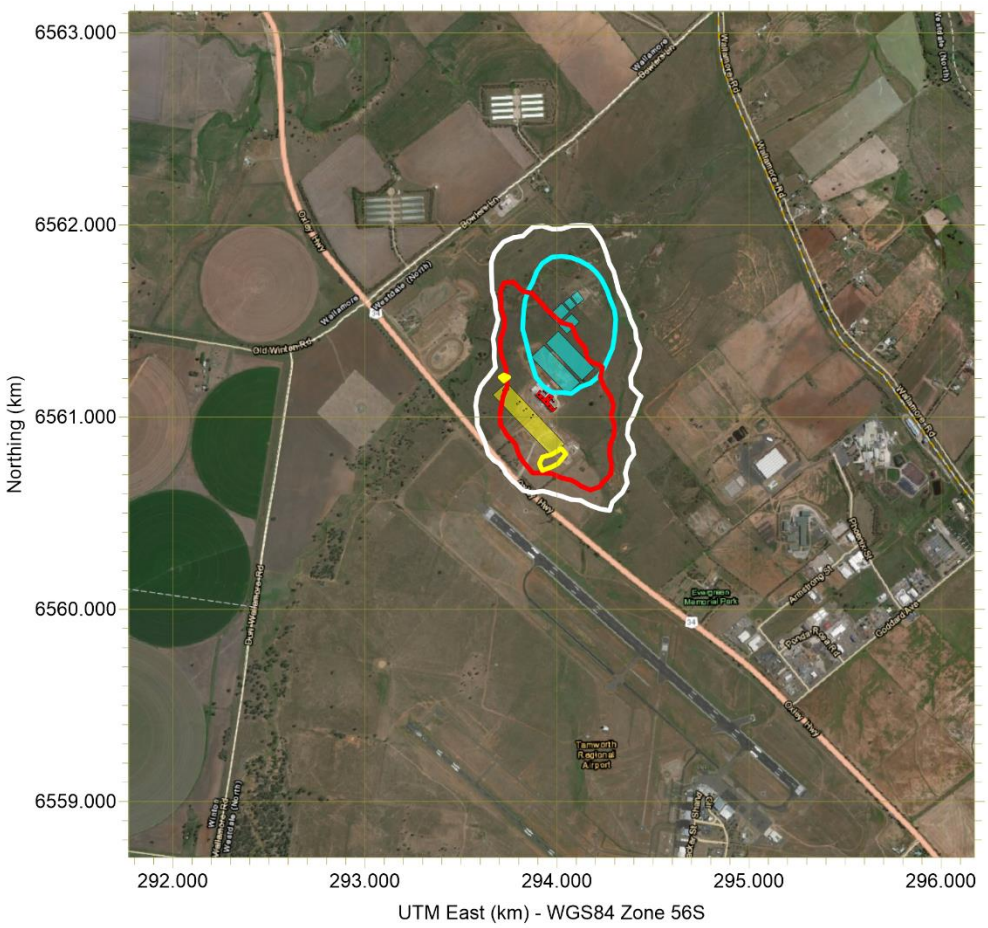
Figure 3.2: Sensitivity test: Poultry Processing Facility projected 5 ou contours:

- Unbroken yellow contour - Live bird odour emission factor as measured; and
- Broken yellow contour - Live bird odour emission factor multiplied by three.

The results for the child care centre location are shown in Table 3.1 below.

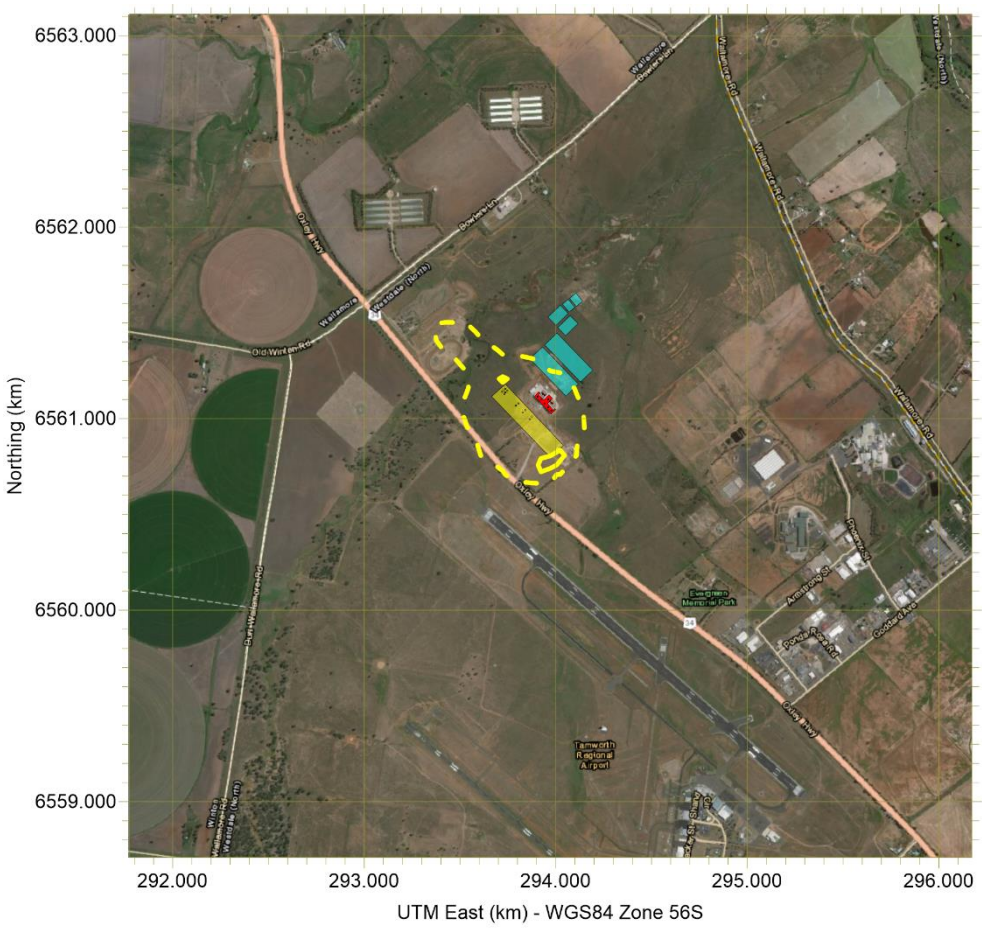
Table 3.1 – Projected ground level concentration at onsite child care centre

UTM X coordinate (km)	UTM Y coordinate (km)	24 hour operation (ou, 99%, P/M60)	6am to 6pm operation (ou, 99%, P/M60)
293.723	6560.958	7.8	4.7



	CALPUFF modelling for Baiada, Oakburn **Proposed Poultry Processing Facility** **Modelled by: S. Hayes 11/01/19** **Checked by:** **The Odour Unit Group**	**All Sources - Oakburn PPF and PRP** **All contours - 5.0 ou, 99.0th percentile frequency, 1-hour average** **Yellow contour - PPF live bird and processing line vents only** **Blue contour - WWTP only** **Red contour - PRP biofilters and building fugitives only** **White contour - All sources cumulated (PPF, PRP & WWTP)**

Figure 3.1: Projected ground level odour concentration - All sources



	CALPUFF modelling for Baiada, Oakburn **Proposed Poultry Processing Facility** **Modelled by: S. Hayes 16/01/19** **Checked by:** **The Odour Unit Group**	**Sensitivity test - Oakburn PPF live bird and processing line vents** **All contours - 5.0 ou, 99.0th percentile frequency, 1-hour average** **Unbroken yellow contour - Live bird odour emission factor as measured** **Broken yellow contour - Live bird odour emission factor x 3**

Figure 3.2: Projected ground level odour concentration – Sensitivity test

4 FINDINGS AND CONCLUSIONS

TOU was commissioned to carry out an odour impact assessment for the proposed PPF to be located at the Oakburn PRP site near Oxley Highway, Westdale NSW.

The odour dispersion modelling assessment was carried out using the CALPUFF Modelling System with use of odour emissions estimates based upon measurements collected by TOU at the Oakburn PRP Baiada Hanwood Processing Plant and at Baiada's Out St, Tamworth abattoir.

All on-site odour sources have been assessed as a cumulated impact and separately grouped by origin: PRP, PPF and WWTP. Odour impact from the PRP biofilters was included as a worst-case scenario despite being a treated emission.

It should be noted that the meteorology developed for the modelling overpredicted calm and light wind conditions, particularly from the south-south-westerly direction. This would have a conservative effect on the results, that is overpredict the extent and magnitude of odour concentration projections, especially north-north-westwards from the site.

It was found that the addition of the proposed PPF does not significantly contribute to the overall odour impact. The PPF modelled alone shows predicted odour impact below the NSW EPA odour IAC of 5 ou as outlined in **Section 2.2** of this report. The sensitivity test scenario demonstrates, as a worst-case scenario, that the live bird shed would have to emit up to three times the amount of odour before the PPF 5 ou footprint begins to encroach upon the Oakburn Park Raceway property.

The results show that the predicted odour impact for Stage Two upgraded WWTP is below the NSW EPA odour IAC under the assumption that SBR night-time filling would be avoided. As a worst-case scenario, the SBR was set to the highest 'fill' emission rate during daytime hours but in practise the fill phase should only take approximately one hour.

With use of the biofilter emissions and fugitive odour emissions calculated from actual measurements collected from the PRP building by TOU, the modelling result for the existing PRP now show odour impacts are below the odour IAC.

Overall, the results are below the odour IAC at the nearest sensitive receptor. The cumulative 5 ou contour encroaches beyond the site boundary marginally to the north and marginally to the south. Therefore, it has been found that the proposed PPF is unlikely to cause adverse odour impacts under normal conditions within the assumptions made for this assessment.

The results for the proposed child care centre show that for a 24 hour per day operation the odour IAC is predicted to be exceeded. However, for a 12 hour per day operation (nominally 6 am to 6 pm), it has been found that the predicted odour concentration is less than the odour IAC. The reduction is due to the exclusion of night-time conditions that is poor for odour dispersion. It is likely that, under night time conditions, the children in the centre would not be in the outside play area but would be indoors.

To further reduce the risk of adverse odour impact upon the child care centre, inclusion of activated carbon filters into the design of the indoor ventilation system could be considered. Landscaping around the boundary of the outdoor play could be incorporated into the design to help mitigate odour impacts. Finally, in the unlikely event that an adverse odour impact occurs, children could be moved indoors until the event has passed.

Therefore, it can be concluded that adverse odour impacts are unlikely upon the proposed childcare centre operating for 12 hours per day under normal conditions within the assumptions made for this assessment.

A modelling-based odour impact assessment is not an ideal tool to help form a contingency plan for unpredicted operational odour impacts. This is best addressed by sufficient odour separation distances (i.e. odour buffers) and/or a proactive and reactive site-specific odour management plan (**OMP**).

An OMP is a documented operational management system and a 'live' manual that is changed as required, to reflect the current practices and odour controls prevalent at the facility. The sole purpose of an OMP is to eliminate, prevent or minimise the potential for odour generation through a hierarchy of controls, in the form of, but not limited to, engineered, administration and/or management practices. An OMP seeks to find a reasonably practical balance between maintaining the quality of process operations designed to yield a high-quality end product and the ability to control odour emission generation.

An odour management plan could include but not limited to measures such as those to:

- Anticipate the formation of odours and control their release;
- Minimise the production and migration of odorous compounds;
- Regularly monitor the odour emissions from key sources;
- Regularly monitor off-site sensitive places;
- Regularly assess the performance of odour control systems;

- Provide design and operational details of the:
    - PRP biofilter odour control system,
    - PPF ventilation systems, and
    - CAL wastewater treatment system; and
- Outline specific steps to address complaints and actions if adverse odour impacts occur beyond the Oakburn site boundary.

References:

- Atmospheric Studies Group, 2011. *CALPUFF Modeling System Version 6 User Instructions..* Lowell: TRC Environmental Corporation.
- Barclay, J. & Scire, J., 2011. *Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia'.* Lowell: Atmospheric Studies Group - TRC Environmental Corporation.
- Boddy, D., 2016. *Odour Impact Assessment for Baiada Poultry Pty Limited's Oakburn Rendering Plant,* Auckland: MWH.
- Boulton, N. & Ireland, D., 2018. *Re: Request for Secretary's Environmental Assessment Requirements for Designated Development, proposed intensification of poultry processing plant at 1154 Gunnedah Road, Westdale,* Brisbane: PSA Consulting (Australia).
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- Gallant, J. C. et al., 2011. *1 second SRTM Derived Digital Elevation Models User Guide,* Canberra: Geoscience Australia.
- Hayes, S. & Munro, S., 2018. *Baiada Poultry, Oakburn - Proposed WWTP Upgrade Odour Impact Assessment,* Capalaba: The Odour Unit.
- JJC Engineering Pty Ltd, 2018. *Concept Design For Wastewater Management,* s.l.: JJC Engineering Pty Ltd.
- Munro, S. & Hayes, S., 2018. *Proposed Bartter Processing Plant Intensification Odour Impact Assessment Hanwood, NSW ,* Capalaba: The Odour Unit.
- United States Geological Survey, 1997. *Global Land Cover Characteristics Data Base,* s.l.: s.n.
- Wessel, P. & Smith, W. H. F., 2015. *Global Self-consistent Hierarchical High-resolution Geography,* s.l.: National Oceanic and Atmospheric Administration - National Centers for Environmental Information.

Appendix A – Overall Layout Plan

EXISTING
CLEARWELLS 1&2
5ML EACH.

SEQUENCE
BATCH
REACTORS 1&2
16ML EACH.

COVERED ANAEROBIC
LAGOON 100ML

COVERED ANAEROBIC
LAGOON 100ML

BOUNDARY

BOUNDARY

LOT 101
DP 1097471

LOT 19
DP 871833

LOT 102
DP 1097471

WATER &
FIRE TANKS

WASTE WATER
TREATMENT
TANKS & PLANT

WWT

LNG
TANKS

OAKBURN RENDERING

MAINTENANCE

FIRE
PUMPS &
CONTROL

WEIGHBRIDGES

109000

REMOVE EXISTING
WASTE WATER
TREATMENT PLANT

SETBACK 9m FOR
TREES & SERVICES

25m W ACCESS
EASEMENT TO
WORKSHOP LANE

BOUNDARY

120000

OAKBURN PROCESSING PLANT

FIRE ACCESS ROAD

STAFF VEHICLE DRIVEWAY

PARKING 820 cars

BOUNDARY

203000

193000

EMERGENCY & VISITOR
VEHICLES ONLY

EXISTING
ENTRANCE WALLS

BOUNDARY

OXLEY HIGHWAY

Baiada

OAKBURN PROCESSING PLANT
SITE PLAN - Lot 100 DP1097471

SCALE: 1:4000 @ A3

0m 100m

181218_OPP_3.0_Site Plan

Appendix B – Odour Concentration Measurement Reports

THE ODOUR UNIT (QLD) PTY LTD

THE ODOUR UNIT

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CAPALABA, Qld 4157

2/57 Neumann Rd,
CAPALABA, Qld 4157

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Facsimile: +61 (0)7 3245 1800
Email: QLDinfo@odourunit.com.au
Internet: www.odourunit.com.au
ABN: 87 102 255 765

NATA
Accreditation Number: 14974

Odour Concentration Measurement Report

The measurement was commissioned by:

Organisation	Baiada Poultry	Telephone	0418 118 045
Contact	Grant White	Facsimile	--
Sampling Site	Oakburn PRP	Email	grant.white@baiada.com.au
Sampling Method	ASNZS4323.3:2001	Sampling Team	TOU - S. Munro/T. Schulz

Order details:

Order requested by	Grant White	Order accepted by	T. Schulz
Date of order	6 July 2018	TOU Project #	Q2223_02
Order number	72696	Project Manager	T. Schulz
Signed by	Brett Kirk	Testing operator	S. Munro

Investigated Item	Odour concentration in odour units 'ou', determined by sensory odour concentration measurements, of an odour sample supplied in a sampling bag.
Identification	The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification), sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required.
Method	The odour concentration measurements were performed using dynamic olfactometry according to the Australian Standard 'Determination of Odour Concentration by Dynamic Olfactometry AS/NZS4323.3:2001. The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for butanol calibration. Any deviation from the Australian standard is recorded in the 'Comments' section of this report.
Measuring Range	The measuring range of the olfactometer is $2^2 \leq \chi \leq 2^{18}$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted. The machine is not calibrated beyond dilution setting 2^{17}. This is specifically mentioned with the results.
Environment	The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained at 22 °C ±3 °C.
Measuring Dates	The date of each measurement is specified with the results.
Instrument Used	The olfactometer used during this testing session was: TOU-OLF-002
Instrumental Precision	The precision of this instrument (expressed as repeatability) for a sensory calibration must be $r \leq 0.477$ in accordance with the Australian Standard AS/NZS4323.3:2001. TOU-OLF-002: $r = 0.359$ (November 2017), Compliance – Yes
Instrumental Accuracy	The accuracy of this instrument for a sensory calibration must be $A \leq 0.217$ in accordance with the Australian Standard AS/NZS4323.3:2001. TOU-OLF-002: $A = 0.122$ (November 2017) Compliance – Yes
Lower Detection Limit (LDL)	The LDL for the olfactometer has been determined to be 16 ou (4 times the lowest dilution setting)
Traceability	The measurements have been performed using standards for which the traceability to the national standard has been demonstrated. The assessors are individually selected to comply with fixed criteria and are monitored in time to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen.

NATA

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced, except in full.

Date: Friday, 10 August 2018

Panel Roster Number: BNE20180809_031

S. Munro
Authorised Signatory

J. Schulz
Authorised Signatory

THE ODOUR UNIT (QLD) PTY LTD

Accreditation Number: 14974

Odour Sample Measurement Results
Panel Roster Number: BNE20180809_031

Sample Location	TOU Sample ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Sample Odour Concentration FINAL (ou)	Odour Emission Rate ($ou.m^3/s$) *2
Low temperature rendering plant Bay 1, composite sample 1	BC18132	08/08/2018 13:08	09/08/2018 12:10	4	8	35	540
Low temperature rendering plant Bay 1, composite sample 2	BC18133	08/08/2018 13:12	09/08/2018 12:25	4	8	49	
Low temperature rendering plant Bay 1, composite sample 3*1	BC18134	08/08/2018 13:18	09/08/2018 13:02	4	4	19	
Low temperature rendering plant Bay 2, composite sample 1	BC18135	08/08/2018 13:30	09/08/2018 13:29	4	8	29	100
Low temperature rendering plant Bay 2, composite sample 2	BC18136	08/08/2018 13:38	09/08/2018 13:57	4	8	17	

Note: Where parties other than The Odour Unit perform the dilution of samples, the result that has been modified by the dilution factor is not covered by The Odour Unit's NATA accreditation.

THE ODOUR UNIT (QLD) PTY LTD

Accreditation Number: 14974

Odour Sample Measurement Results
Panel Roster Number: BNE20180809_031

Sample Location	TOU Sample ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Sample Odour Concentration FINAL (ou)	Odour Emission Rate ($ou.m^3/s$) *2
High temperature rendering plant Bay 1, composite sample 1*1	BC18137	08/08/2018 15:38	09/08/2018 14:46	4	4	<16	390
High temperature rendering plant Bay 1, composite sample 2	BC18138	08/08/2018 15:40	09/08/2018 15:01	4	8	38	
High temperature rendering plant Bay 1, composite sample 3*1	BC18139	08/08/2018 15:55	09/08/2018 15:18	4	4	16	
High temperature rendering plant Bay 2, composite sample 1	BC18140	08/08/2018 15:45	09/08/2018 15:38	4	8	54	84
High temperature rendering plant Bay 2, composite sample 2	BC18141	08/08/2018 15:50	09/08/2018 16:00	4	8	35	

Note: Where parties other than The Odour Unit perform the dilution of samples, the result that has been modified by the dilution factor is not covered by The Odour Unit's NATA accreditation.

THE ODOUR UNIT (QLD) PTY LTD

Accreditation Number: 14974

Odour Panel Calibration Results

Reference Odorant	Reference Odorant Panel Roster Number	Concentration of Reference gas (ppb)	Panel Target Range for n-butanol (ppb)	Measured Concentration (ou)	Measured Panel Threshold (ppb)	Does this panel calibration measurement comply with AS/NZS4323.3:2001 (Yes / No)
n-butanol	BNE20180809_031	50,700	$20 \leq \chi \leq 80$	861	59	Yes

Comments
*1 Insufficient sample for three full rounds
*2 OER calculated from the geomean of samples for each bay

Disclaimer
Parties, other than TOU, responsible for collecting odour samples hereby certify that they have voluntarily furnished these odour samples, appropriately collected and labelled, to The Odour Unit Pty Ltd for the purpose of odour testing. The collection of odour samples by parties other than The Odour Unit Pty Ltd relinquishes The Odour Unit Pty Ltd from all responsibility for the sample collection and any effects or actions that the results from the test(s) may have.

Note

END OF DOCUMENT

THE ODOUR UNIT PTY LTD

THE ODOUR UNIT

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Email: info@odourunit.com.au
Internet: www.odourunit.com.au
ABN: 53 091 165 061

NATA

Accreditation Number: 14974

Odour Concentration Measurement Results

The measurement was commissioned by:

Organisation	Baiada	Telephone	0418 118 045
Contact	Grant White	Facsimile	--
Sampling Site	Tamworth, NSW	Email	grant.white@baiada.com.au
Sampling Method	Drum & Pump	Sampling Team	TOU (S. Munro, J, Schulz)

Order details:

Order requested by	Grant White	Order accepted by	T. Schulz
Date of order		TOU Project #	N2243L
Order number	Refer to correspondence	Project Manager	J. Schulz
Signed by	Refer to correspondence	Testing operator	A. Schulz

Investigated Item	Odour concentration in odour units 'ou', determined by sensory odour concentration measurements, of an odour sample supplied in a sampling bag.
Identification	The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification), sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required.
Method	The odour concentration measurements were performed using dynamic olfactometry according to the Australian Standard 'Determination of Odour Concentration by Dynamic Olfactometry' AS/NZS4323.3:2001. The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for butanol calibration. Accredited for compliance with ISO/IEC 17025 – Testing. This report shall not be reproduced, except in full. Any deviation from the Australian standard is recorded in the 'Comments' section of this report.
Measuring Range	The measuring range of the olfactometer is $2^2 \leq \chi \leq 2^{18}$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted. The machine is not calibrated beyond dilution setting 2^{17}. This is specifically mentioned with the results.
Environment	The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained between 22ºC and 25ºC.
Measuring Dates	The date of each measurement is specified with the results.
Instrument Used	The olfactometer used during this testing session was: ODORMAT SERIES V04
Instrumental Precision	The precision of this instrument (expressed as repeatability) for a sensory calibration must be $r \leq 0.477$ in accordance with the Australian Standard AS/NZS4323.3:2001. ODORMAT SERIES V04: $r = 0.101$ (January 2018) Compliance – Yes
Instrumental Accuracy	The accuracy of this instrument for a sensory calibration must be $A \leq 0.217$ in accordance with the Australian Standard AS/NZS4323.3:2001. ODORMAT SERIES V04: $A = 0.212$ (January 2018) Compliance – Yes
Lower Detection Limit (LDL)	The LDL for the olfactometer has been determined to be 16 ou (4 times the lowest dilution setting)
Traceability	The measurements have been performed using standards for which the traceability to the national standard has been demonstrated. The assessors are individually selected to comply with fixed criteria and are monitored in time to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen.

Date: Wednesday, 21 August 2018

Panel Roster Number: SYD20180809_054

J. Schulz
NSW Laboratory Coordinator

A. Schulz
Authorised Signatory

THE ODOUR UNIT PTY LTD

Accreditation Number: 14974

Odour Sample Measurement Results
Panel Roster Number: SYD20180809_054

Sample Location	TOU Sample ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Nominal Sample Dilution	Actual Sample Dilution (Adjusted for Temperature)	Sample Odour Concentration (as received, in the bag) (ou)	Sample Odour Concentration (Final, allowing for dilution) (ou)	Specific Odour Emission Rate (ou.$m^3/m^2/s$)
Sample #1 Out St Live Bird – Fan 3	SC18347	08/08/2018 0859 hrs	09/08/2018 1012 hrs	4	8	--	--	45	45	--
Sample #2 Out St Live Bird – Fan 2	SC18348	08/08/2018 0907 hrs	09/08/2018 1037 hrs	4	8	--	--	59	59	--
Sample #3 Out St Live Bird – Fan 3	SC18349	08/08/2018 0915 hrs	09/08/2018 1059 hrs	4	8	--	--	70	70	--
Sample #4 Out St Live Bird – Fan 2	SC18350	08/08/2018 0924 hrs	09/08/2018 1120 hrs	4	8	--	--	76	76	--
Sample #5 Out St Live Bird – Fan 3	SC18351	08/08/2018 1019 hrs	09/08/2018 1137 hrs	4	8	--	--	45	45	--

Note: The following are not covered by the NATA Accreditation issued to The Odour Unit Pty Ltd:

1. The collection of Isolation Flux Hood (**IFH**) samples and the calculation of the Specific Odour Emission Rate (**SOER**).
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit Pty Ltd. have performed the dilution of samples.

THE ODOUR UNIT PTY LTD

Accreditation Number: 14974

Odour Sample Measurement Results
Panel Roster Number: SYD20180809_054

Sample Location	TOU Sample ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Nominal Sample Dilution	Actual Sample Dilution (Adjusted for Temperature)	Sample Odour Concentration (as received, in the bag) (ou)	Sample Odour Concentration (Final, allowing for dilution) (ou)	Specific Odour Emission Rate (ou.$m^3/m^2/s$)
Sample #6 Out St Live Bird – Fan 2	SC18352	08/08/2018 1028 hrs	09/08/2018 1156 hrs	4	8	--	--	49	49	--
Sample #7 Out St Live Bird – Fan 2	SC18353	08/08/2018 1035 hrs	09/08/2018 1300 hrs	4	8	--	--	38	38	--
Sample #8 Out St Live Bird – Fan 2	SC18354	08/08/2018 1042 hrs	09/08/2018 1320 hrs	4	8	--	--	45	45	--
Sample #9 Oakburn Receival Bag	SC18355	08/08/2018 1347 hrs	09/08/2018 1343 hrs	4	8	--	--	59	59	--
Sample #10 Oakburn Receival Bag	SC18356	08/08/2018 1355 hrs	09/08/2018 1407 hrs	4	8	--	--	45	45	--

Note: The following are not covered by the NATA Accreditation issued to The Odour Unit Pty Ltd:

1. The collection of Isolation Flux Hood (**IFH**) samples and the calculation of the Specific Odour Emission Rate (**SOER**).
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit Pty Ltd. have performed the dilution of samples

Odour Panel Calibration Results

Reference Odorant	Reference Odorant Panel Roster Number	Concentration of Reference gas (ppb)	Panel Target Range for n-butanol (ppb)	Measured Concentration (ou)	Measured Panel Threshold (ppb)	Does this panel calibration measurement comply with AS/NZS4323.3:2001 (Yes / No)
n-butanol	SYD20180809_054	51,400	$20 \leq \chi \leq 80$	724	71	Yes

Comments Odour characters (non-NATA accredited) as determined by odour laboratory panel:

SC18348 musty, poultry
SC18349 musty, poultry
SC18350 musty, poultry
SC18351 musty, poultry
SC18452 musty, poultry
SC18453 musty, poultry
SC18454 musty, poultry
SC18455 musty, poultry
SC18455 musty, poultry

Disclaimer Parties, other than TOU, responsible for collecting odour samples hereby certify that they have voluntarily furnished these odour samples, appropriately collected and labelled, to The Odour Unit Pty Ltd for the purpose of odour testing. The collection of odour samples by parties other than The Odour Unit Pty Ltd relinquishes The Odour Unit Pty Ltd from all responsibility for the sample collection and any effects or actions that the results from the test(s) may have.

END OF DOCUMENT

ODOUR EMISSION RATE CALCULATION TABLE

Client: *Baiada*
Client Contact: *Grant White*
Site Location: *Oakburn*

SAMPLE LOCATION	TOU SAMPLE NUMBER	SAMPLING DATE	TIME OF DAY	ODOUR CONCENTRATION (ou)	RECT. DUCT LENGTH (mm)	RECT. DUCT WIDTH (mm)	CROSS SECTIONAL AREA (m^2)	SOURCE GAS VELOCITY (m/s)	SOURCE GAS VOLUMETRIC FLOW RATE (m^3/s)	DUCT TEMPERATURE (^oC)	ATMOSPHERIC PRESSURE (hPa)	VOLUMETRIC FLOW RATE TO STD. CONDITIONS (m^3/s)	ODOUR EMISSION RATE TO STD. CONDITIONS ($ou.m^3/s$) RAW	ODOUR EMISSION RATE TO STD. CONDITIONS ($ou.m^3/s$) 2 SIG. FIG.
LTRP Bay 1, Geomean samples 1 - 3, door 1				32	3300	3600	11.880	0.5	5.94	25.0	1013.0	5.44	174.1336913	**170**
LTRP Bay 1, Geomean samples 1 - 3, door 2				32	3300	3600	11.880	0.4	4.40	25.0	1013.0	4.03	128.8589315	**130**
LTRP Bay 1, Geomean samples 1 - 3, door 3				32	3300	3600	11.880	0.3	3.56	25.0	1013.0	3.27	104.4802148	**100**
LTRP Bay 1, Geomean samples 1 - 3, door 4				32	2000	800	1.600	1.0	1.57	25.0	1013.0	1.44	45.96660403	**46**
LTRP Bay 1, Geomean samples 1 - 3, door 5				32	3300	3600	11.880	0.3	2.97	25.0	1013.0	2.72	87.06684564	**87**
				32			**49.120**		**18.44**	**25.0**	**1013.0**	**16.89**	**540.5062872**	**540**
LTRP Bay 2, Geomean samples 1 - 2, Door 1				22	2000	800	1.600	1.0	1.52	25.0	1013.0	1.39	30.63463087	**31**
LTRP Bay 2, Geomean samples 1 - 2, Door 2				22	2000	800	1.600	1.0	1.60	25.0	1013.0	1.47	32.24697987	**32**
LTRP Bay 2, Geomean samples 1 - 2, Door 3				22	3600	1900	6.840	0.3	2.05	25.0	1013.0	1.88	41.35675168	**41**
				22			**10.040**		**5.17**	**25.0**	**1013.0**	**4.74**	**104.2383624**	**100**
HTRP Bay 1, Geomean sanmples 1 - 3, Door 1				21	3300	3600	11.880	0.1	1.66	25.0	1013.0	1.52	31.99706577	**32**
HTRP Bay 1, Geomean sanmples 1 - 3, Door 2				21	2000	800	1.600	0.5	0.82	25.0	1013.0	0.75	15.69841611	**16**
HTRP Bay 1, Geomean sanmples 1 - 3, Door 3				21	3300	3600	11.880	0.6	7.37	25.0	1013.0	6.75	141.7012913	**140**
HTRP Bay 1, Geomean sanmples 1 - 3, Door 4				21	3300	3600	11.880	0.9	10.45	25.0	1013.0	9.58	201.1244134	**200**
				21			**37.240**		**20.30**	**25.0**	**1013.0**	**18.60**	**390.5211866**	**390**
HTRP Bay 2, Geomean samples 1 - 2, Door 1				43	2000	800	1.600	0.5	0.86	25.0	1013.0	0.79	34.03522148	**34**
HTRP Bay 2, Geomean samples 1 - 2, Door 2				43	2000	800	1.600	0.4	0.64	25.0	1013.0	0.59	25.21127517	**25**
HTRP Bay 2, Geomean samples 1 - 2, Door 3				43	2000	800	1.600	0.4	0.64	25.0	1013.0	0.59	25.21127517	**25**
				43			**4.800**		**2.14**	**25.0**	**1013.0**	**1.96**	**84.45777181**	**84**

Appendix C – Source, emission and BPIP configurations

Point sources														
Source Description	Source Name	X Coordinates	Y Coordinates	Height (m)	Base elevation (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp (K)	Building Downwash	Platform Height (m)	Vertical Momentum Flux Factor	Odour Emission Rate ($ou.m^3/s$)	Peak Total Odour Emission Rate - P/M60 2.3 ($ou.m^3/s$)	Comments
Rendering plant biofilter 1	BF1a	293.929	6561.134	2	385	8.3	0.05	313	1	0	1	1,389	3,194	Based on the 1,000 ou used for the 2016 MWH report.
Rendering plant biofilter 2	BF1b	293.934	6561.128	2	385	8.3	0.05	313	1	0	1	1,389	3,194	Based on the 1,000 ou used for the 2016 MWH report.
Rendering plant biofilter 3	BF1c	293.941	6561.122	2	385	8.3	0.05	313	1	0	1	1,389	3,194	Based on the 1,000 ou used for the 2016 MWH report.
Rendering plant biofilter 4	BF2a	293.972	6561.089	2	385	8.3	0.05	313	1	0	1	1,389	3,194	Based on the 1,000 ou used for the 2016 MWH report.
Rendering plant biofilter 5	BF2b	293.977	6561.083	2	385	8.3	0.05	313	1	0	1	1,389	3,194	Based on the 1,000 ou used for the 2016 MWH report.
Rendering plant biofilter 6	BF2c	293.982	6561.078	2	385	8.3	0.05	313	1	0	1	1,389	3,194	Based on the 1,000 ou used for the 2016 MWH report.
Live Bird Ventilation - Vent 1	LB1	293.736	6561.156	13	385	1.88	15	293.15	1	0	1	0.35 /bird	0.80 /bird	Birds present between 2 am and 9 pm.
Live Bird Ventilation - Vent 2	LB2	293.726	6561.147	13	385	1.88	15	293.15	1	0	1	0.35 /bird	0.80 /bird	Birds present between 2 am and 9 pm.
Live Bird Ventilation - Vent 3	LB3	293.718	6561.140	13	385	1.88	15	293.15	1	0	1	0.35 /bird	0.80 /bird	Birds present between 2 am and 9 pm.
Live Bird Ventilation - Vent 4	LB4	293.746	6561.145	13	385	1.88	15	293.15	1	0	1	0.35 /bird	0.80 /bird	Birds present between 2 am and 9 pm.
Live Bird Ventilation - Vent 5	LB5	293.737	6561.136	13	385	1.88	15	293.15	1	0	1	0.35 /bird	0.80 /bird	Birds present between 2 am and 9 pm.
Live Bird Ventilation - Vent 6	LB6	293.730	6561.129	13	385	1.88	15	293.15	1	0	1	0.35 /bird	0.80 /bird	Birds present between 2 am and 9 pm.
Processing Ventilation - Vent 1	EV1	293.792	6561.067	13	385	0.72	15	273.15	1	0	1	1,464	3,366	Operation hours 5 am to 8 pm.
Processing Ventilation - Vent 2	EV2	293.804	6561.080	13	385	0.72	15	273.15	1	0	1	1,464	3,366	Operation hours 5 am to 8 pm.
Processing Ventilation - Vent 3	DF1	293.827	6561.032	13	385	0.72	15	273.15	1	0	1	1,464	3,366	Operation hours 5 am to 8 pm.
Processing Ventilation - Vent 4	DF2	293.839	6561.045	13	385	0.72	15	273.15	1	0	1	1,464	3,366	Operation hours 5 am to 8 pm.
Processing Ventilation - Vent 5	AC1	293.865	6560.996	13	385	0.72	15	273.15	1	0	1	1,464	3,366	Operation hours 5 am to 8 pm.
Processing Ventilation - Vent 6	AC2	293.875	6561.010	13	385	0.72	15	273.15	1	0	1	1,464	3,366	Operation hours 5 am to 8 pm.

Area Sources																
Source Description	Source ID	X1 Coordinates	Y1 Coordinates	X2 Coordinates	Y2 Coordinates	X3 Coordinates	Y3 Coordinates	X4 Coordinates	Y4 Coordinates	Height (m)	Base elevation (m)	Initial Sigma Z (m)	Specific Odour Emission Rate ($ou.m^3/m^2/s$)	Peak Specific Odour Emission Rate - P/M60 2.5 ($ou.m^3/m^2/s$)	Peak Specific Odour Emission Rate - P/M60 2.3 ($ou.m^3/m^2/s$)	Comments
Covered Anaerobic Lagoon #1	CAL1	293.942	6561.385	294.006	6561.447	294.193	6561.253	294.129	6561.191	0	383	1	0.0518	0.130	0.119	Assume 99.9% biogas capture and incineration. Maximum measured abattoir anaerobic pond emission.
Covered Anaerobic Lagoon #2	CAL2	293.865	6561.312	293.931	6561.374	294.118	6561.180	294.053	6561.117	0	385	1	0.0518	0.130	0.119	Assume 99.9% biogas capture and incineration. Maximum measured abattoir anaerobic pond emission.
SBR #1 Fill	SBR1	293.959	6561.530	294.024	6561.592	294.065	6561.549	294.001	6561.487	0	381	1	3.89	9.725	8.947	Baiada Hanwood results used for calculations. Daytime OER runs for 9 hrs.
SBR #1 Aeration Start of Cycle	SBR1	293.959	6561.530	294.024	6561.592	294.065	6561.549	294.001	6561.487	0	381	1	0.224	0.560	0.515	Baiada Hanwood results used for calculations. Nightime OER runs for 3 hrs.
SBR #1 Aeration Middle of Cycle	SBR1	293.959	6561.530	294.024	6561.592	294.065	6561.549	294.001	6561.487	0	381	1	0.082	0.205	0.189	Baiada Hanwood results used for calculations. Nightime OER runs for 3 hrs.
SBR #1 Aeration End of Cycle	SBR1	293.959	6561.530	294.024	6561.592	294.065	6561.549	294.001	6561.487	0	381	1	0.030	0.075	0.069	Baiada Hanwood results used for calculations. Nightime OER runs for 3 hrs.
SBR #1 Settling/Decant	SBR1	293.959	6561.530	294.024	6561.592	294.065	6561.549	294.001	6561.487	0	381	1	0.018	0.045	0.041	Baiada Hanwood results used for calculations. Nightime OER runs for 6 hrs.
SBR #2 Fill	SBR2	294.010	6561.475	294.075	6561.537	294.116	6561.496	294.051	6561.432	0	381	1	3.89	9.725	8.947	Baiada Hanwood results used for calculations. Daytime OER runs for 9 hrs.
SBR #2 Aeration Start of Cycle	SBR2	294.010	6561.475	294.075	6561.537	294.116	6561.496	294.051	6561.432	0	381	1	0.224	0.560	0.515	Baiada Hanwood results used for calculations. Nightime OER runs for 3 hrs.
SBR #2 Aeration Middle of Cycle	SBR2	294.010	6561.475	294.075	6561.537	294.116	6561.496	294.051	6561.432	0	381	1	0.082	0.205	0.189	Baiada Hanwood results used for calculations. Nightime OER runs for 3 hrs.
SBR #2 Aeration End of Cycle	SBR2	294.010	6561.475	294.075	6561.537	294.116	6561.496	294.051	6561.432	0	381	1	0.030	0.075	0.069	Baiada Hanwood results used for calculations. Nightime OER runs for 3 hrs.
SBR #2 Settling/Decant	SBR2	294.010	6561.475	294.075	6561.537	294.116	6561.496	294.051	6561.432	0	381	1	0.018	0.045	0.041	Baiada Hanwood results used for calculations. Nightime OER runs for 6 hrs.
Clear Well 1	CW1	294.072	6561.628	294.105	6561.656	294.140	6561.613	294.107	6561.586	0	379	1	0.141	0.353	0.324	Baiada Hanwood results used for calculations.
Clear Well 2	CW2	294.034	6561.597	294.065	6561.623	294.100	6561.581	294.070	6561.556	0	380	1	0.141	0.353	0.324	Baiada Hanwood results used for calculations.

Volume Sources											
Source Description	Source ID	X Coordinates	Y Coordinates	Height (m)	Init. Sigma Y	Init. Sigma Z	Height (m)	Base elevation (m)	Odour Emission Rate ($ou.m^3/s$)	Peak Odour Emission Rate - P/M60 2.3 ($ou.m^3/s$)	Comments
Hot side storage	htst	293.905	6561.114	6.4	5.2	6.0	6.4	385	193	444	Based on sampling 08/08/2018.
Hot side processing	htpr	293.922	6561.098	6.4	5.2	6.0	6.4	385	897	2,063	Based on sampling 08/08/2018.
Cold side processing	ctpr	293.960	6561.058	6.4	5.2	6.0	6.4	385	1,242	2,857	Based on sampling 08/08/2018.
Cold side storage	ctst	293.976	6561.041	6.4	5.2	6.0	6.4	385	193	444	Based on sampling 08/08/2018.
Loading bay	lb	293.959	6561.100	7.2	7.4	6.7	7.2	385	10,943	25,169	Based on sampling 08/08/2018.

Baiada, Oakburn

BPIP (Dated: 04274)
DATE : 9/27/2018
TIME : 23: 7:18
Baiada, Oakburn

==========
BPIP PROCESSING INFORMATION:
==========

The P flag has been set for preparing downwash related data
for a model run utilizing the PRIME algorithm.

Inputs entered in METERS will be converted to meters using
a conversion factor of 1.0000. Output will be in meters.

The UTMP variable is set to UTMY. The input is assumed to be in
UTM coordinates. BPIP will move the UTM origin to the first pair of
UTM coordinates read. The UTM coordinates of the new origin will
be subtracted from all the other UTM coordinates entered to form
this new local coordinate system.

The new local coordinates will be displayed in parentheses just below
the UTM coordinates they represent.

Plant north is set to 0.00 degrees with respect to True North.

==========
INPUT SUMMARY:
==========

Number of buildings to be processed : 5

Boiler has 1 tier(s) with a base elevation of 385.00 METERS

BUILDING NAME	TIER NUMBER	BLDG-TIER NUMBER	TIER HEIGHT	NO. OF CORNERS	CORNER COORDINATES X	Y
Boiler	1	1	12.80	4	293863.00	6561142.00 meters
					(0.00	0.00) meters
					293884.00	6561163.00 meters
					(21.00	21.00) meters
					293894.00	6561153.00 meters
					(31.00	11.00) meters
					293874.00	6561132.00 meters
					(11.00	-10.00) meters

RP has 3 tier(s) with a base elevation of 385.00 METERS

BUILDING NAME	TIER NUMBER	BLDG-TIER NUMBER	TIER HEIGHT	NO. OF CORNERS	CORNER COORDINATES X	Y

```
RP          1        4     12.80    12
                                          293889.00  6561116.00 meters
                                      (       26.00      -26.00) meters
                                          293911.00  6561141.00 meters
                                      (       48.00       -1.00) meters
                                          293917.00  6561134.00 meters
                                      (       54.00       -8.00) meters
                                          293909.00  6561126.00 meters
                                      (       46.00      -16.00) meters
                                          293937.00  6561098.00 meters
                                      (       74.00      -44.00) meters
                                          293964.00  6561125.00 meters
                                      (      101.00      -17.00) meters
                                          293982.00  6561106.00 meters
                                      (      119.00      -36.00) meters
                                          293957.00  6561079.00 meters
                                      (       94.00      -63.00) meters
                                          293987.00  6561044.00 meters
                                      (      124.00      -98.00) meters
                                          293996.00  6561053.00 meters
                                      (      133.00      -89.00) meters
                                          294000.00  6561048.00 meters
                                      (      137.00      -94.00) meters
                                          293977.00  6561025.00 meters
                                      (      114.00     -117.00) meters
RP          2        5     14.40     4
                                          293923.00  6561083.00 meters
                                      (       60.00      -59.00) meters
                                          293964.00  6561125.00 meters
                                      (      101.00      -17.00) meters
                                          293982.00  6561106.00 meters
                                      (      119.00      -36.00) meters
                                          293944.00  6561060.00 meters
                                      (       81.00      -82.00) meters
RP          3        6     16.00     4
                                          293923.00  6561083.00 meters
                                      (       60.00      -59.00) meters
                                          293937.00  6561098.00 meters
                                      (       74.00      -44.00) meters
                                          293959.00  6561075.00 meters
                                      (       96.00      -67.00) meters
                                          293944.00  6561060.00 meters
                                      (       81.00      -82.00) meters


DAF1      has 1 tier(s) with a base elevation of  388.00 METERS
BUILDING  TIER  BLDG-TIER  TIER   NO. OF      CORNER   COORDINATES
  NAME    NUMBER   NUMBER  HEIGHT  CORNERS        X           Y

DAF1        1        7      3.00     4
                                          294080.00  6560853.00 meters
                                      (      217.00     -289.00) meters
                                          294085.00  6560858.00 meters
                                      (      222.00     -284.00) meters
                                          294094.00  6560852.00 meters
                                      (      231.00     -290.00) meters
```

```
                                        294089.00  6560846.00 meters
                                    (      226.00     -296.00) meters


DAF2     has 1 tier(s) with a base elevation of  388.00 METERS
BUILDING  TIER  BLDG-TIER  TIER   NO. OF      CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS        X           Y

DAF2        1       10      4.00     4
                                        294089.00  6560840.00 meters
                                    (      226.00     -302.00) meters
                                        294096.00  6560849.00 meters
                                    (      233.00     -293.00) meters
                                        294109.00  6560840.00 meters
                                    (      246.00     -302.00) meters
                                        294102.00  6560831.00 meters
                                    (      239.00     -311.00) meters


PPlant   has 1 tier(s) with a base elevation of  383.00 METERS
BUILDING  TIER  BLDG-TIER  TIER   NO. OF      CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS        X           Y

PPlant      1       13     12.80     4
                                        293665.00  6561116.00 meters
                                    (     -198.00      -26.00) meters
                                        293737.00  6561180.00 meters
                                    (     -126.00       38.00) meters
                                        294039.00  6560861.00 meters
                                    (      176.00     -281.00) meters
                                        293975.00  6560794.00 meters
                                    (      112.00     -348.00) meters

Number of stacks to be processed :  20

                   STACK            STACK   COORDINATES
 STACK NAME      BASE  HEIGHT          X           Y

 BF1a          385.00    2.00 METERS
                                 293929.00  6561134.00 meters
                             (       66.00       -8.00) meters
 BF1b          385.00    2.00 METERS
                                 293934.00  6561128.00 meters
                             (       71.00      -14.00) meters
 BF1c          385.00    2.00 METERS
                                 293941.00  6561122.00 meters
                             (       78.00      -20.00) meters
 BF2a          385.00    2.00 METERS
                                 293972.00  6561090.00 meters
                             (      109.00      -52.00) meters
 BF2b          385.00    2.00 METERS
                                 293977.00  6561083.00 meters
                             (      114.00      -59.00) meters
 BF2c          385.00    2.00 METERS
                                 293982.00  6561078.00 meters
                             (      119.00      -64.00) meters
 WWTPBF        388.00    1.00 METERS
```

```
                                294097.00  6560853.00 meters
                           (      234.00     -289.00) meters
 LB1          385.00   13.00 METERS
                                293736.00  6561156.00 meters
                           (     -127.00       14.00) meters
 LB2          385.00   13.00 METERS
                                293726.00  6561147.00 meters
                           (     -137.00        5.00) meters
 LB3          385.00   13.00 METERS
                                293718.00  6561140.00 meters
                           (     -145.00       -2.00) meters
 LB4          385.00   13.00 METERS
                                293746.00  6561145.00 meters
                           (     -117.00        3.00) meters
 LB5          385.00   13.00 METERS
                                293737.00  6561136.00 meters
                           (     -126.00       -6.00) meters
 LB6          385.00   13.00 METERS
                                293730.00  6561129.00 meters
                           (     -133.00      -13.00) meters
 PRCBF        385.00    2.00 METERS
                                293827.00  6561117.00 meters
                           (      -36.00      -25.00) meters
 DF1          385.00   13.00 METERS
                                293792.00  6561067.00 meters
                           (      -71.00      -75.00) meters
 DF2          385.00   13.00 METERS
                                293804.00  6561080.00 meters
                           (      -59.00      -62.00) meters
 EV1          385.00   13.00 METERS
                                293827.00  6561032.00 meters
                           (      -36.00     -110.00) meters
 EV2          385.00   13.00 METERS
                                293839.00  6561045.00 meters
                           (      -24.00      -97.00) meters
 AC1          385.00   13.00 METERS
                                293865.00  6560996.00 meters
                           (        2.00     -146.00) meters
 AC2          385.00   13.00 METERS
                                293875.00  6561010.00 meters
                           (       12.00     -132.00) meters


 The following lists the stacks that have been identified
 as being atop the noted building-tiers.

          STACK            BUILDING         TIER
          NAME      NO.    NAME        NO.  NO.
          LB1        8     PPlant       5    1
          LB2        9     PPlant       5    1
          LB3       10     PPlant       5    1
          LB4       11     PPlant       5    1
          LB5       12     PPlant       5    1
          LB6       13     PPlant       5    1
          DF1       15     PPlant       5    1
          DF2       16     PPlant       5    1
          EV1       17     PPlant       5    1
```

```
         EV2       18     PPlant       5     1
         AC1       19     PPlant       5     1
         AC2       20     PPlant       5     1


                    Overall GEP Summary Table
                         (Units: meters)


StkNo:  1  Stk Name:BF1a     Stk Ht:   2.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  16.00  PBW:   28.55             *Eqn1 Ht:   40.00
         *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  333.25
  Bldg-Tier nos. contributing to GEP:   6


StkNo:  2  Stk Name:BF1b     Stk Ht:   2.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  16.00  PBW:   29.15             *Eqn1 Ht:   40.00
         *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  334.75
  Bldg-Tier nos. contributing to GEP:   6


StkNo:  3  Stk Name:BF1c     Stk Ht:   2.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  16.00  PBW:   30.83             *Eqn1 Ht:   40.00
         *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  339.25
  Bldg-Tier nos. contributing to GEP:   6


StkNo:  4  Stk Name:BF2a     Stk Ht:   2.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  16.00  PBW:   31.78             *Eqn1 Ht:   40.00
         *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:   43.25
  Bldg-Tier nos. contributing to GEP:   6


StkNo:  5  Stk Name:BF2b     Stk Ht:   2.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  16.00  PBW:   33.14             *Eqn1 Ht:   40.00
         *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  110.50
  Bldg-Tier nos. contributing to GEP:   6


StkNo:  6  Stk Name:BF2c     Stk Ht:   2.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  16.00  PBW:   31.96             *Eqn1 Ht:   40.00
         *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  113.75
  Bldg-Tier nos. contributing to GEP:   6


StkNo:  7  Stk Name:WWTPBF   Stk Ht:   1.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:  330.80             *Eqn1 Ht:   27.00
         *adjusted for a Stack-Building elevation difference of    5.00
 No. of Tiers affecting Stk:  1  Direction occurred:  101.50
  Bldg-Tier nos. contributing to GEP:  13
```

```
StkNo:  8  Stk Name:LB1      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:   96.27             *Eqn1 Ht:   30.00
         *adjusted for a Stack-Building elevation difference of    2.00
 No. of Tiers affecting Stk:  1  Direction occurred:  136.25
  Bldg-Tier nos. contributing to GEP:  13


StkNo:  9  Stk Name:LB2      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:   96.27             *Eqn1 Ht:   30.00
         *adjusted for a Stack-Building elevation difference of    2.00
 No. of Tiers affecting Stk:  1  Direction occurred:  136.25
  Bldg-Tier nos. contributing to GEP:  13


StkNo: 10  Stk Name:LB3      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:   96.27             *Eqn1 Ht:   30.00
         *adjusted for a Stack-Building elevation difference of    2.00
 No. of Tiers affecting Stk:  1  Direction occurred:  136.25
  Bldg-Tier nos. contributing to GEP:  13


StkNo: 11  Stk Name:LB4      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:   96.27             *Eqn1 Ht:   30.00
         *adjusted for a Stack-Building elevation difference of    2.00
 No. of Tiers affecting Stk:  1  Direction occurred:  136.25
  Bldg-Tier nos. contributing to GEP:  13


StkNo: 12  Stk Name:LB5      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:   96.27             *Eqn1 Ht:   30.00
         *adjusted for a Stack-Building elevation difference of    2.00
 No. of Tiers affecting Stk:  1  Direction occurred:  136.25
  Bldg-Tier nos. contributing to GEP:  13


StkNo: 13  Stk Name:LB6      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:   96.27             *Eqn1 Ht:   30.00
         *adjusted for a Stack-Building elevation difference of    2.00
 No. of Tiers affecting Stk:  1  Direction occurred:  136.25
  Bldg-Tier nos. contributing to GEP:  13


StkNo: 14  Stk Name:PRCBF    Stk Ht:   2.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:   18.27             *Eqn1 Ht:   32.00
         *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  232.00
  Bldg-Tier nos. contributing to GEP:   1


StkNo: 15  Stk Name:DF1      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
           GEP:  BH:  12.80  PBW:   96.27             *Eqn1 Ht:   30.00
         *adjusted for a Stack-Building elevation difference of    2.00
 No. of Tiers affecting Stk:  1  Direction occurred:  136.25
  Bldg-Tier nos. contributing to GEP:  13
```

```
 StkNo: 16  Stk Name:DF2      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
            GEP:  BH:  12.80  PBW:   96.27            *Eqn1 Ht:   30.00
          *adjusted for a Stack-Building elevation difference of    2.00
  No. of Tiers affecting Stk:  1  Direction occurred:  136.25
   Bldg-Tier nos. contributing to GEP:  13


 StkNo: 17  Stk Name:EV1      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
            GEP:  BH:  12.80  PBW:   96.27            *Eqn1 Ht:   30.00
          *adjusted for a Stack-Building elevation difference of    2.00
  No. of Tiers affecting Stk:  1  Direction occurred:  136.25
   Bldg-Tier nos. contributing to GEP:  13


 StkNo: 18  Stk Name:EV2      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
            GEP:  BH:  12.80  PBW:   96.27            *Eqn1 Ht:   30.00
          *adjusted for a Stack-Building elevation difference of    2.00
  No. of Tiers affecting Stk:  1  Direction occurred:  136.25
   Bldg-Tier nos. contributing to GEP:  13


 StkNo: 19  Stk Name:AC1      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
            GEP:  BH:  12.80  PBW:   96.27            *Eqn1 Ht:   30.00
          *adjusted for a Stack-Building elevation difference of    2.00
  No. of Tiers affecting Stk:  1  Direction occurred:  136.25
   Bldg-Tier nos. contributing to GEP:  13


 StkNo: 20  Stk Name:AC2      Stk Ht:  13.00 Prelim. GEP Stk.Ht:   65.00
            GEP:  BH:  12.80  PBW:   96.27            *Eqn1 Ht:   30.00
          *adjusted for a Stack-Building elevation difference of    2.00
  No. of Tiers affecting Stk:  1  Direction occurred:  136.25
   Bldg-Tier nos. contributing to GEP:  13
```

Appendix D – Example CALPUFF list files

CALPUFF Version: 7.2.1 Level: 150618

****

Clock time: 16:50:50
Date: 01-14-2019

Internal Coordinate Transformations by --- COORDLIB Version: 1.99 Level: 070921

Control File Type: CALPUFF.INP 7.0 Groups 0f,0g added; new emission scaling

Run Title:
CALPUFF Demonstration Run
(Not intended as a guide for configuring options)
prp_src1-allday_WWTP_janfeb

**** CONFIRMATION OF CONTROL DATA ****

---------- INPUT GROUP 1 ----------

metrun = 0
ibyr = 2017
ibmo = 1
ibdy = 1
ibhr = 0
ibsec = 0
ibdathr = 201700100
ieyr = 2017
iemo = 3
iedy = 1
iehr = 0
iesec = 0
iedathr = 201706000
nsecdt = 3600
irlg = 1416
iavg = 1
xbtz = -10.0000000
abtz = UTC+1000
nspec = 1
nse = 1
itest = 2
metfm = 1
mprffm = 1
mrestart= 0
nrespd = 0
avet = 60.0000000
pgtime = 60.0000000
ioutu = 2

```
--------------  INPUT GROUP 2  ---------------

mgauss =  1
mctadj =  3
mctsg  =  0
mslug  =  0
mtrans =  1
mchem  =  0
maqchem =  0
mlwc   =  0
mwet   =  0
mdry   =  0
mtilt  =  0
mdisp  =  2
mdisp2 =  3
mturbvw =  3
mtauly =  0.00000000E+00
mtauadv=  0
mcturb =  1
mrough =  0
mtip   =  1
mbdw   =  2
mshear =  0
mrise  =  1
mrise_fl=  2
mtip_fl=  0
msplit =  0
mpartl =  1
mpartlba=  1
mtinv  =  0
mpdf   =  1
msgtibl=  0
mbcon  =  0
msource=  0
mfog   =  0
mreg   =  0

--------------  INPUT GROUP 3  ---------------

SPECIES: ODOR          j: 1  isplst(-,j) =   1  1  0  GROUP: ODOR

--------------  INPUT GROUP 4  ---------------

pmap    = UTM
datum   = WGS-84
daten   = 02-21-2003
utmhem  = S
iutmzn  =  56
nx      =  150
ny      =  150
nz      =  11
zface  =  0.00000000E+00 20.0000000 40.0000000 80.0000000 160.000000 320.000000 640.000000
1000.00000 1500.00000 2000.00000 2500.00000 3000.00000
dgridkm =  0.200000003
xorigkm =  279.072998
yorigkm =  6546.00781
iutmzn  =  56
```

```
ibcomp  =  50
jbcomp  =  50
iecomp  =  100
jecomp  =  100
lsamp   =  T
ibsamp  =  64
jbsamp  =  64
iesamp  =  86
jesamp  =  86
meshdn  =  4

--------------  INPUT GROUP 5  ---------------

icon    =  1
idry    =  0
iwet    =  0
it2d    =  0
irho    =  0
ivis    =  0
lcomprs =  T
icprt   =  0
idprt   =  0
iwprt   =  0
icfrq   =  0
idfrq   =  0
iwfrq   =  0
(note:  i_frq values converted to timesteps)
iprtu   =  5
imesg   =  2
imflx   =  0
imbal   =  0
inrise  =  0
iqaplot =  1
ipftrak =  0
ldebug  =  F
ipfdeb  =  1
npfdeb  =  1
nn1     =  1
nn2     =  10

GROUP: ODOR          j:   1  ioutop(-,j) =  0 1 0 0 0 0 0

--------------  INPUT GROUP 6  ---------------

        ------  Subgroup (6a)  ------

nhill  =  0
nctrec =  0
mhill  =  2
xhill2m=  1.00000000
zhill2m=  1.00000000
xctdmkm=  0.00000000E+00
yctdmkm=  0.00000000E+00

        ------  Subgroup (6b)  ------
```

```
        ------  Subgroup (6c)  ------


--------------  INPUT GROUP 7  ---------------

SPECIES: ODOR          j:   1  dryg(-,j) =    -999.00   -999.00   -999.00   -999.00   -999.00

--------------  INPUT GROUP 8  ---------------

SPECIES: ODOR          j:   1  dryp(-,j) =    -999.00   -999.00

--------------  INPUT GROUP 9  ---------------

rcutr   =  30.0000000
rgr     =  10.0000000
reactr  =  8.00000000
pconst  =  2.30000001E-08
bmin    =  1.00000001E-07
bmax    =  2.49999994E-06
qswmax  =  600.000000
dconst1 =  2.00000000
dconst2 =  0.666666687
dconst3 =  4.79999988E-04
dconst4 =  0.666666687
nint    =  9
iveg    =  1

--------------  INPUT GROUP 10  ---------------

SPECIES: ODOR          j:   1  wa(-,j) =  0.000E+00   0.000E+00

--------------  INPUT GROUP 11  ---------------

moz      =  0
bcko3m   =  80.0000000 80.0000000 80.0000000 80.0000000
         =  80.0000000 80.0000000 80.0000000 80.0000000
         =  80.0000000 80.0000000 80.0000000 80.0000000
mnh3     =  0
mavgnh3  =  1
bcknh3m  =  10.0000000 10.0000000 10.0000000 10.0000000
         =  10.0000000 10.0000000 10.0000000 10.0000000
         =  10.0000000 10.0000000 10.0000000 10.0000000
rnite1   =  0.200000003
rnite2   =  2.00000000
rnite3   =  2.00000000
mh2o2    =  1
bckh2o2m =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
rh_isrp  =  50.0000000
so4_isrp =  4.00000005E-07
bckpmf   =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
ofrac    =  0.150000006 0.150000006 0.200000003 0.200000003
         =  0.200000003 0.200000003 0.200000003 0.200000003
         =  0.200000003 0.200000003 0.200000003 0.150000006
```

```
vcnx     =  50.0000000 50.0000000 50.0000000 50.0000000
         =  50.0000000 50.0000000 50.0000000 50.0000000
         =  50.0000000 50.0000000 50.0000000 50.0000000

--------------  INPUT GROUP 12  ---------------

sytdep   =  550.000000
mhftsz   =  0
jsup     =  5
conk1    =  9.99999978E-03
conk2    =  0.100000001
iurb1    =  10
iurb2    =  19

anemht   =  10.0000000
isigmav  =  1
imixctdm =  0
ilanduin =  20
z0in     =  0.250000000
xlaiin   =  3.00000000
elevin   =  0.00000000E+00
xlatin   =  -999.000000
xlonin   =  -999.000000

xmxlen   =  1.00000000
mxnew    =  99
xsamlen  =  1.00000000
mxsam    =  99
ncount   =  2
sl2pf    =  10.0000000
wscalm   =  0.499994993
cdiv     =  0.00000000E+00 0.00000000E+00

tkcat    =  265.000000   top for class 1
tkcat    =  270.000000   top for class 2
tkcat    =  275.000000   top for class 3
tkcat    =  280.000000   top for class 4
tkcat    =  285.000000   top for class 5
tkcat    =  290.000000   top for class 6
tkcat    =  295.000000   top for class 7
tkcat    =  300.000000   top for class 8
tkcat    =  305.000000   top for class 9
tkcat    =  310.000000   top for class 10
tkcat    =  315.000000   top for class 11

wscat    =  1.53999996   top for class 1
wscat    =  3.08999991   top for class 2
wscat    =  5.13999987   top for class 3
wscat    =  8.22999954   top for class 4
wscat    =  10.8000002   top for class 5

Over LAND
svmin    =  0.200000003  for stability 1
svmin    =  0.200000003  for stability 2
svmin    =  0.200000003  for stability 3
svmin    =  0.200000003  for stability 4
svmin    =  0.200000003  for stability 5
```

```
svmin    =  0.200000003  for stability 6
swmin    =  0.200000003  for stability 1
swmin    =  0.119999997  for stability 2
swmin    =  7.99999982E-02  for stability 3
swmin    =  5.99999987E-02  for stability 4
swmin    =  2.99999993E-02  for stability 5
swmin    =  1.60000008E-02  for stability 6

Over WATER
svmin    =  0.200000003  for stability 1
svmin    =  0.200000003  for stability 2
svmin    =  0.200000003  for stability 3
svmin    =  0.200000003  for stability 4
svmin    =  0.200000003  for stability 5
svmin    =  0.200000003  for stability 6
swmin    =  0.200000003  for stability 1
swmin    =  0.119999997  for stability 2
swmin    =  7.99999982E-02  for stability 3
swmin    =  5.99999987E-02  for stability 4
swmin    =  2.99999993E-02  for stability 5
swmin    =  1.60000008E-02  for stability 6

symin    =  1.00000000
szmin    =  1.00000000
szcap_m  =  5000000.00
xminzi   =  50.0000000
xmaxzi   =  3000.00000

plx0     =  7.00000003E-02    for stability 1
plx0     =  7.00000003E-02    for stability 2
plx0     =  0.100000001    for stability 3
plx0     =  0.150000006    for stability 4
plx0     =  0.349999994    for stability 5
plx0     =  0.550000012    for stability 6

ptg0     =  1.99999996E-02    for stability 5
ptg0     =  3.50000001E-02    for stability 6

ppc      =  0.500000000    for stability 1
ppc      =  0.500000000    for stability 2
ppc      =  0.500000000    for stability 3
ppc      =  0.500000000    for stability 4
ppc      =  0.349999994    for stability 5
ppc      =  0.349999994    for stability 6
tbd      =  0.500000000
tibldist =  1.00000000 10.0000000 9.00000000
nlutibl  =  4
fclip    =  0.00000000E+00
nsplit   =  3
iresplit =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 1 0 0
         =  0 0 0 0
zisplit  =  100.000000
roldmax  =  0.250000000
```

```
nsplith  =  5
sysplith =  1.00000000
shsplith =  2.00000000
cnsplith =  1.00000001E-07
epsslug  =  9.99999975E-05
epsarea  =  9.99999997E-07
dsrise   =  1.00000000
trajincl =  20.0000000
mdepbc   =  1
htminbc  =  500.000000
rsampbc  =  10.0000000

--------------  INPUT GROUP 13  ---------------

npt1     =  0
iptu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nspt1    =  0
npt2     =  0


--------------  INPUT GROUP 14  ---------------

nar1     =  6
iaru     =  5   units =   OUV/s/m^2
   converted to g/s/m^2, odour_units*m/s,
   or Bq/s/m^2  by factor:  1.00000000
nsar1    =  6
nar2     =  0

cnamar1  = CW1             CW2             SBR1            SBR2            CAL1
CAL2
htar1    =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00
elar1    =  379.260010 379.730011 380.779999 380.940002 383.320007 384.589996
sz0ar1   =  1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000

area source: CW1               number:  1
qar1     =  332.737061
area1    =  2359.83716
[x,y]ar1grd  =  74.9949646 78.1005859
[x,y]ar1grd  =  75.1600647 78.2397461
[x,y]ar1grd  =  75.3350830 78.0249023
[x,y]ar1grd  =  75.1699829 77.8906250
ODOR        Emission Factor Type: WSP6_PGCLASS6
Index  1  to  6  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000 2.50000000
2.50000000
Index  7  to  12  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000 2.50000000
2.50000000
Index  13  to  18  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000
2.50000000 2.50000000
Index  19  to  24  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000
2.50000000 2.50000000
Index  25  to  30  Emission Factor =  2.29999995 2.29999995 2.29999995 2.29999995
2.29999995 2.29999995
Index  31  to  36  Emission Factor =  2.29999995 2.29999995 2.29999995 2.29999995
```

```
2.29999995 2.29999995

area source: CW2              number:  2
qar1     =  305.619720
area1    =  2167.51562
[x,y]ar1grd  =  74.8049927 77.9467773
[x,y]ar1grd  =  74.9600220 78.0761719
[x,y]ar1grd  =  75.1350403 77.8662109
[x,y]ar1grd  =  74.9850464 77.7416992
ODOR        Emission Factor Type: WSP6_PGCLASS6
Index  1  to  6  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000 2.50000000
2.50000000
Index  7  to  12  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000 2.50000000
2.50000000
Index  13  to  18  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000
2.50000000 2.50000000
Index  19  to  24  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000
2.50000000 2.50000000
Index  25  to  30  Emission Factor =  2.29999995 2.29999995 2.29999995 2.29999995
2.29999995 2.29999995
Index  31  to  36  Emission Factor =  2.29999995 2.29999995 2.29999995 2.29999995
2.29999995 2.29999995

area source: SBR1             number:  3
qar1     =  5344.50977
area1    =  5344.50977
[x,y]ar1grd  =  74.4300842 77.6098633
[x,y]ar1grd  =  74.7549438 77.9199219
[x,y]ar1grd  =  74.9600220 77.7050781
[x,y]ar1grd  =  74.6400452 77.3950195
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  7.50000030E-02 7.50000030E-02 4.50000018E-02
4.50000018E-02 4.50000018E-02 4.50000018E-02 4.50000018E-02 9.72500038 9.72500038
9.72500038 9.72500038 9.72500038 9.72500038 9.72500038 9.72500038 9.72500038 9.72500038
0.560000002 0.560000002 0.560000002 0.204999998 0.204999998 0.204999998 7.50000030E-02

area source: SBR2             number:  4
qar1     =  5311.17529
area1    =  5311.17529
[x,y]ar1grd  =  74.6850586 77.3364258
[x,y]ar1grd  =  75.0100708 77.6464844
[x,y]ar1grd  =  75.2149963 77.4414062
[x,y]ar1grd  =  74.8899841 77.1215820
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  7.50000030E-02 7.50000030E-02 4.50000018E-02
4.50000018E-02 4.50000018E-02 4.50000018E-02 4.50000018E-02 9.72500038 9.72500038
9.72500038 9.72500038 9.72500038 9.72500038 9.72500038 9.72500038 9.72500038 9.72500038
0.560000002 0.560000002 0.560000002 0.204999998 0.204999998 0.204999998 7.50000030E-02

area source: CAL1             number:  5
qar1     =  1243.42188
area1    =  24004.2832
[x,y]ar1grd  =  74.3449402 76.8847656
[x,y]ar1grd  =  74.6650696 77.1948242
[x,y]ar1grd  =  75.5999756 76.2255859
[x,y]ar1grd  =  75.2799988 75.9155273
ODOR        Emission Factor Type: WSP6_PGCLASS6
```

```
Index  1  to  6  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000 2.50000000
2.50000000
Index  7  to  12  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000 2.50000000
2.50000000
Index  13  to  18  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000
2.50000000 2.50000000
Index  19  to  24  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000
2.50000000 2.50000000
Index  25  to  30  Emission Factor =  2.29999995 2.29999995 2.29999995 2.29999995
2.29999995 2.29999995
Index  31  to  36  Emission Factor =  2.29999995 2.29999995 2.29999995 2.29999995
2.29999995 2.29999995

area source: CAL2              number:  6
qar1     =  1266.50342
area1    =  24449.8711
[x,y]ar1grd  =  73.9599609 76.5209961
[x,y]ar1grd  =  74.2900085 76.8310547
[x,y]ar1grd  =  75.2250671 75.8618164
[x,y]ar1grd  =  74.9000549 75.5468750
ODOR        Emission Factor Type: WSP6_PGCLASS6
Index  1  to  6  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000 2.50000000
2.50000000
Index  7  to  12  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000 2.50000000
2.50000000
Index  13  to  18  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000
2.50000000 2.50000000
Index  19  to  24  Emission Factor =  2.50000000 2.50000000 2.50000000 2.50000000
2.50000000 2.50000000
Index  25  to  30  Emission Factor =  2.29999995 2.29999995 2.29999995 2.29999995
2.29999995 2.29999995
Index  31  to  36  Emission Factor =  2.29999995 2.29999995 2.29999995 2.29999995
2.29999995 2.29999995

--------------  INPUT GROUP 15  ---------------

nln2     =  0
nlines   =  0
ilnu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nsln1    =  0
xl       =  0.00000000E+00
hbl      =  0.00000000E+00
wbl      =  0.00000000E+00
wml      =  0.00000000E+00
dxl      =  0.00000000E+00
fprimel  =  0.00000000E+00
mxnseg     =  7
nlrise   =  6


--------------  INPUT GROUP 16  ---------------

nvl1     =  0
ivlu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
```

```
      by factor:  1.00000000
nsvl1    =  0
nvl2     =  0


--------------  INPUT GROUP 17  ---------------

nfl2     =  0

--------------  INPUT GROUP 18  ---------------

nrd1     =  0
nrd2     =  0
nsfrds   =  0


--------------  INPUT GROUP 20  ---------------

nrec     =  0
nrgrp    =  0



------------------------------------------------------------------------------------------------
-------------------------------------
         INPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.INP         1
 prp_src1-allday_WWTP_janfebcalpuff.inp

(CALMET Domain: 1 )  MASTER
  CALMET.DAT       100
  janfebcalmet.dat




------------------------------------------------------------------------------------------------
-------------------------------------
         OUTPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.LST         2
 prp_src1-allday_wwtp_janfebcalpuff.lst

    CONC.DAT         8
    prp_src1-allday_wwtp_janfebcalpuff.con



SETNEST: Setup results for nested CALMET grids
------------------------------------------

Properties of each CALMET domain grid
```

```
  Domain      =  1
  Origin(m)   =  279073.000 6546008.00
nx,ny,cell(m) =  150 150 200.000000
  Nest Factor =  1
Offset nx0,ny0=  0.00000000E+00 0.00000000E+00
Corner coordinates in outermost grid units:
  LL Corner   =  0.00000000E+00 0.00000000E+00
  UR Corner   =  150.000000 150.000000
Horizontal splitting parameters for domain:
  SYSPLITH(m) =  200.000000
SHSPLITH(m/s) =  0.111111112


 LAST PERIOD PROCESSED ENDS AT:
      Year: 2017  Month:  3   Day:  1   Julian day:  60   Hour:  0   Second:    0


 End of run -- Clock time: 19:17:43
                    Date: 01-14-2019

       Elapsed Clock Time:     8813.0 (seconds)

                  CPU Time:     8480.0 (seconds)
```

CALPUFF Version: 7.2.1 Level: 150618

****

Clock time: 11:15:47
Date: 01-10-2019

Internal Coordinate Transformations by --- COORDLIB Version: 1.99 Level: 070921

Control File Type: CALPUFF.INP 7.0 Groups 0f,0g added; new emission scaling

Run Title:
CALPUFF Demonstration Run
(Not intended as a guide for configuring options)
prp_src2_rp_janfeb

**** CONFIRMATION OF CONTROL DATA ****

---------- INPUT GROUP 1 ----------

metrun = 1
ibyr = 0
ibmo = 0
ibdy = 0
ibhr = 0
ibsec = 0
ibdathr = 0
ieyr = 2017
iemo = 3
iedy = 1
iehr = 0
iesec = 0
iedathr = 0
nsecdt = 3600
irlg = 0
iavg = 1
xbtz = -10.0000000
abtz = UTC+1000
nspec = 1
nse = 1
itest = 2
metfm = 1
mprffm = 1
mrestart= 0
nrespd = 0
avet = 60.0000000
pgtime = 60.0000000
ioutu = 2

```
--------------  INPUT GROUP 2  ---------------

mgauss =  1
mctadj =  3
mctsg  =  0
mslug  =  0
mtrans =  1
mchem  =  0
maqchem =  0
mlwc   =  0
mwet   =  0
mdry   =  0
mtilt  =  0
mdisp  =  2
mdisp2 =  3
mturbvw =  3
mtauly =  0.00000000E+00
mtauadv=  0
mcturb =  1
mrough =  0
mtip   =  1
mbdw   =  2
mshear =  0
mrise  =  1
mrise_fl=  2
mtip_fl=  0
msplit =  0
mpartl =  1
mpartlba=  1
mtinv  =  0
mpdf   =  1
msgtibl=  0
mbcon  =  0
msource=  0
mfog   =  0
mreg   =  0

--------------  INPUT GROUP 3  ---------------

SPECIES: ODOR          j: 1  isplst(-,j) =   1  1  0  GROUP: ODOR

--------------  INPUT GROUP 4  ---------------

pmap    = UTM
datum   = WGS-84
daten   = 02-21-2003
utmhem  = S
iutmzn  =  56
nx      =  150
ny      =  150
nz      =  11
zface  =  0.00000000E+00 20.0000000 40.0000000 80.0000000 160.000000 320.000000 640.000000
1000.00000 1500.00000 2000.00000 2500.00000 3000.00000
dgridkm =  0.200000003
xorigkm =  279.072998
yorigkm =  6546.00781
iutmzn  =  56
```

```
ibcomp  =  50
jbcomp  =  50
iecomp  =  100
jecomp  =  100
lsamp   =  T
ibsamp  =  64
jbsamp  =  64
iesamp  =  86
jesamp  =  86
meshdn  =  4

--------------  INPUT GROUP 5  ---------------

icon    =  1
idry    =  0
iwet    =  0
it2d    =  0
irho    =  0
ivis    =  0
lcomprs =  T
icprt   =  0
idprt   =  0
iwprt   =  0
icfrq   =  0
idfrq   =  0
iwfrq   =  0
(note:  i_frq values converted to timesteps)
iprtu   =  5
imesg   =  2
imflx   =  0
imbal   =  0
inrise  =  0
iqaplot =  1
ipftrak =  0
ldebug  =  F
ipfdeb  =  1
npfdeb  =  1
nn1     =  1
nn2     =  10

GROUP: ODOR          j:   1  ioutop(-,j) =  0 1 0 0 0 0 0

--------------  INPUT GROUP 6  ---------------

        ------  Subgroup (6a)  ------

nhill  =  0
nctrec =  0
mhill  =  2
xhill2m=  1.00000000
zhill2m=  1.00000000
xctdmkm=  0.00000000E+00
yctdmkm=  0.00000000E+00

        ------  Subgroup (6b)  ------
```

```
        ------  Subgroup (6c)  ------


--------------  INPUT GROUP 7  ---------------

SPECIES: ODOR          j:   1  dryg(-,j) =    -999.00   -999.00   -999.00   -999.00   -999.00

--------------  INPUT GROUP 8  ---------------

SPECIES: ODOR          j:   1  dryp(-,j) =    -999.00   -999.00

--------------  INPUT GROUP 9  ---------------

rcutr   =  30.0000000
rgr     =  10.0000000
reactr  =  8.00000000
pconst  =  2.30000001E-08
bmin    =  1.00000001E-07
bmax    =  2.49999994E-06
qswmax  =  600.000000
dconst1 =  2.00000000
dconst2 =  0.666666687
dconst3 =  4.79999988E-04
dconst4 =  0.666666687
nint    =  9
iveg    =  1

--------------  INPUT GROUP 10  ---------------

SPECIES: ODOR          j:   1  wa(-,j) =  0.000E+00   0.000E+00

--------------  INPUT GROUP 11  ---------------

moz      =  0
bcko3m   =  80.0000000 80.0000000 80.0000000 80.0000000
         =  80.0000000 80.0000000 80.0000000 80.0000000
         =  80.0000000 80.0000000 80.0000000 80.0000000
mnh3     =  0
mavgnh3  =  1
bcknh3m  =  10.0000000 10.0000000 10.0000000 10.0000000
         =  10.0000000 10.0000000 10.0000000 10.0000000
         =  10.0000000 10.0000000 10.0000000 10.0000000
rnite1   =  0.200000003
rnite2   =  2.00000000
rnite3   =  2.00000000
mh2o2    =  1
bckh2o2m =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
rh_isrp  =  50.0000000
so4_isrp =  4.00000005E-07
bckpmf   =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
ofrac    =  0.150000006 0.150000006 0.200000003 0.200000003
         =  0.200000003 0.200000003 0.200000003 0.200000003
         =  0.200000003 0.200000003 0.200000003 0.150000006
```

```
vcnx     =  50.0000000 50.0000000 50.0000000 50.0000000
         =  50.0000000 50.0000000 50.0000000 50.0000000
         =  50.0000000 50.0000000 50.0000000 50.0000000

--------------  INPUT GROUP 12  ---------------

sytdep   =  550.000000
mhftsz   =  0
jsup     =  5
conk1    =  9.99999978E-03
conk2    =  0.100000001
iurb1    =  10
iurb2    =  19

anemht   =  10.0000000
isigmav  =  1
imixctdm =  0
ilanduin =  20
z0in     =  0.250000000
xlaiin   =  3.00000000
elevin   =  0.00000000E+00
xlatin   =  -999.000000
xlonin   =  -999.000000

xmxlen   =  1.00000000
mxnew    =  99
xsamlen  =  1.00000000
mxsam    =  99
ncount   =  2
sl2pf    =  10.0000000
wscalm   =  0.499994993
cdiv     =  0.00000000E+00 0.00000000E+00

tkcat    =  265.000000   top for class 1
tkcat    =  270.000000   top for class 2
tkcat    =  275.000000   top for class 3
tkcat    =  280.000000   top for class 4
tkcat    =  285.000000   top for class 5
tkcat    =  290.000000   top for class 6
tkcat    =  295.000000   top for class 7
tkcat    =  300.000000   top for class 8
tkcat    =  305.000000   top for class 9
tkcat    =  310.000000   top for class 10
tkcat    =  315.000000   top for class 11

wscat    =  1.53999996   top for class 1
wscat    =  3.08999991   top for class 2
wscat    =  5.13999987   top for class 3
wscat    =  8.22999954   top for class 4
wscat    =  10.8000002   top for class 5

Over LAND
svmin    =  0.200000003  for stability 1
svmin    =  0.200000003  for stability 2
svmin    =  0.200000003  for stability 3
svmin    =  0.200000003  for stability 4
svmin    =  0.200000003  for stability 5
```

```
svmin    =  0.200000003  for stability 6
swmin    =  0.200000003  for stability 1
swmin    =  0.119999997  for stability 2
swmin    =  7.99999982E-02  for stability 3
swmin    =  5.99999987E-02  for stability 4
swmin    =  2.99999993E-02  for stability 5
swmin    =  1.60000008E-02  for stability 6

Over WATER
svmin    =  0.200000003  for stability 1
svmin    =  0.200000003  for stability 2
svmin    =  0.200000003  for stability 3
svmin    =  0.200000003  for stability 4
svmin    =  0.200000003  for stability 5
svmin    =  0.200000003  for stability 6
swmin    =  0.200000003  for stability 1
swmin    =  0.119999997  for stability 2
swmin    =  7.99999982E-02  for stability 3
swmin    =  5.99999987E-02  for stability 4
swmin    =  2.99999993E-02  for stability 5
swmin    =  1.60000008E-02  for stability 6

symin    =  1.00000000
szmin    =  1.00000000
szcap_m  =  5000000.00
xminzi   =  50.0000000
xmaxzi   =  3000.00000

plx0     =  7.00000003E-02    for stability 1
plx0     =  7.00000003E-02    for stability 2
plx0     =  0.100000001    for stability 3
plx0     =  0.150000006    for stability 4
plx0     =  0.349999994    for stability 5
plx0     =  0.550000012    for stability 6

ptg0     =  1.99999996E-02    for stability 5
ptg0     =  3.50000001E-02    for stability 6

ppc      =  0.500000000    for stability 1
ppc      =  0.500000000    for stability 2
ppc      =  0.500000000    for stability 3
ppc      =  0.500000000    for stability 4
ppc      =  0.349999994    for stability 5
ppc      =  0.349999994    for stability 6
tbd      =  0.500000000
tibldist =  1.00000000 10.0000000 9.00000000
nlutibl  =  4
fclip    =  0.00000000E+00
nsplit   =  3
iresplit =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 1 0 0
         =  0 0 0 0
zisplit  =  100.000000
roldmax  =  0.250000000
```

```
nsplith  =  5
sysplith =  1.00000000
shsplith =  2.00000000
cnsplith =  1.00000001E-07
epsslug  =  9.99999975E-05
epsarea  =  9.99999997E-07
dsrise   =  1.00000000
trajincl =  20.0000000
mdepbc   =  1
htminbc  =  500.000000
rsampbc  =  10.0000000

--------------  INPUT GROUP 13  ---------------

npt1     =  6
iptu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nspt1    =  0
npt2     =  0

cnampt1  = BF1A            BF1B            BF1C            BF2A            BF2B
BF2C
xpt1grd  =  74.2799377 74.3049622 74.3400574 74.4949341 74.5199585 74.5449829
ypt1grd  =  75.6298828 75.6005859 75.5712891 75.4052734 75.3759766 75.3515625
htstak   =  2.00000000 2.00000000 2.00000000 2.00000000 2.00000000 2.00000000
elstak   =  385.000000 385.000000 385.000000 385.000000 385.000000 385.000000
diam     =  8.30000019 8.30000019 8.30000019 8.30000019 8.30000019 8.30000019
exitw    =  5.00000007E-02 5.00000007E-02 5.00000007E-02 5.00000007E-02 5.00000007E-02
5.00000007E-02
tstak    =  313.000000 313.000000 313.000000 313.000000 313.000000 313.000000
idownw   =  1 1 1 1 1 1
syipt1   =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00
szipt1   =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00
fmfpt1   =  1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
zplatpt1 =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00

pt. source: BF1A             number:  1
qstak    =  3194.00000
bwidth   =  36.8400002 127.559998 130.130005 128.740005 131.289993 133.460007 131.580002
125.699997 31.0000000 67.4899979 67.9199982 66.2900009 62.6500015 64.8099976 62.5999985
63.3100014 62.0999985 59.0000000 54.1100006 127.559998 130.130005 128.740005 131.289993
133.460007 131.580002 125.699997 116.000000 67.4899979 67.9199982 66.2900009 62.6500015
59.9799995 27.1800003 31.0900002 34.0600014 36.0000000
bht      =  16.0000000 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 14.3999996 14.3999996 14.3999996 14.3999996 12.8000002 14.3999996
14.3999996 14.3999996 14.3999996 14.3999996 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 14.3999996 14.3999996 14.3999996 14.3999996
14.3999996 16.0000000 16.0000000 16.0000000 16.0000000
bln1     =  36.2099991 89.5199966 80.0999985 68.2500000 64.8099976 75.5400009 83.9700012
97.5100021 31.0000000 54.1100006 47.5800018 39.5999985 30.8700008 131.289993 46.2900009
54.2400017 60.5400009 65.0000000 67.4899979 89.5199966 80.0999985 68.2500000 64.8099976
75.5400009 83.9700012 97.5100021 111.000000 54.1100006 47.5800018 39.5999985 30.8700008
36.9399986 36.4099998 38.0999985 38.6399994 38.0000000
```

```
xbadj1   =  -70.2699966 -86.0100021 -70.4000015 -52.6500015 -42.2099991 -43.6399994
-43.7400017 -42.5200005 -66.0000000 2.95000005 11.8000002 20.2999992 28.1900005 -16.9300003
25.2900009 20.4300003 14.9399996 9.00000000 2.78999996 -3.50999999 -9.71000004 -15.6000004
-22.6000004 -31.8999996 -40.2299995 -54.9900017 -71.0000000 -57.0600014 -59.3800011
-59.9000015 -59.0600014 -66.3300018 -71.5899963 -74.6699982 -75.4800034 -74.0000000
ybadj1   =  -21.3700008 -32.3499985 -39.4199982 -45.2999992 -48.7099991 -51.6699982
-53.0499992 -52.8300018 13.5000000 -36.5299988 -30.4500008 -23.4400005 -15.7200003
-9.80000019 0.600000024 8.56999969 16.2800007 23.5000000 30.0000000 32.3499985 39.4199982
45.2999992 48.7099991 51.6699982 53.0499992 52.8300018 51.0000000 36.5299988 30.4500008
23.4400005 15.7200003 7.38999987 17.1100006 7.53000021 -2.26999998 -12.0000000

pt. source: BF1B              number:  2
qstak    =  3194.00000
bwidth   =  36.8400002 36.5699997 130.130005 128.740005 131.289993 133.460007 131.580002
125.699997 65.0000000 67.4899979 67.9199982 66.2900009 62.6500015 59.9799995 27.1800003
31.0900002 34.0600014 36.0000000 36.8400002 36.5699997 130.130005 128.740005 131.289993
133.460007 131.580002 125.699997 65.0000000 67.4899979 67.9199982 66.2900009 62.6500015
59.9799995 27.1800003 31.0900002 34.0600014 36.0000000
bht      =  16.0000000 16.0000000 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 16.0000000
16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 14.3999996 14.3999996 14.3999996 14.3999996 14.3999996
14.3999996 16.0000000 16.0000000 16.0000000 16.0000000
bln1     =  36.2099991 33.3100014 80.0999985 68.2500000 64.8099976 75.5400009 83.9700012
97.5100021 59.0000000 54.1100006 47.5800018 39.5999985 30.8700008 36.9399986 36.4099998
38.0999985 38.6399994 38.0000000 36.2099991 33.3100014 80.0999985 68.2500000 64.8099976
75.5400009 83.9700012 97.5100021 59.0000000 54.1100006 47.5800018 39.5999985 30.8700008
36.9399986 36.4099998 38.0999985 38.6399994 38.0000000
xbadj1   =  -65.2300034 -60.4799995 -67.6999969 -51.2599983 -42.1899986 -44.9700012
-46.3899994 -46.4000015 -11.0000000 -3.01999998 5.05000019 12.9700003 20.5000000 21.5799999
27.4799995 29.2199993 30.0699997 30.0000000 29.0200005 27.1599998 -12.3999996 -16.9899998
-22.6299992 -30.5699997 -37.5800018 -51.1100006 -48.0000000 -51.0900002 -52.6300011
-52.5699997 -51.3699989 -58.5200005 -63.8899994 -67.3199997 -68.6999969 -68.0000000
ybadj1   =  -15.3999996 -23.3400002 -32.0900002 -37.6100006 -40.9000015 -43.9700012
-45.7099991 -46.0499992 -35.5000000 -31.4899998 -26.5200005 -20.7399998 -14.3400002
-7.36000013 -18.4400005 -10.1800003 -1.62000000 7.00000000 15.3999996 23.3400002 32.0900002
37.6100006 40.9000015 43.9700012 45.7099991 46.0499992 35.5000000 31.4899998 26.5200005
20.7399998 14.3400002 7.36000013 18.4400005 10.1800003 1.62000000 -7.00000000

pt. source: BF1C              number:  3
qstak    =  3194.00000
bwidth   =  36.8400002 36.5699997 35.1800003 128.740005 131.289993 133.460007 54.2400017
60.5400009 65.0000000 67.4899979 67.9199982 66.2900009 62.6500015 59.9799995 27.1800003
31.0900002 34.0600014 36.0000000 36.8400002 36.5699997 35.1800003 128.740005 131.289993
133.460007 54.2400017 60.5400009 65.0000000 67.4899979 67.9199982 66.2900009 62.6500015
59.9799995 27.1800003 31.0900002 34.0600014 36.0000000
bht      =  16.0000000 16.0000000 16.0000000 12.8000002 12.8000002 12.8000002 14.3999996
14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 16.0000000
16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 12.8000002 12.8000002
12.8000002 14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 14.3999996
14.3999996 16.0000000 16.0000000 16.0000000 16.0000000
bln1     =  36.2099991 33.3100014 29.4099998 68.2500000 64.8099976 75.5400009 63.3100014
62.0999985 59.0000000 54.1100006 47.5800018 39.5999985 30.8700008 36.9399986 36.4099998
38.0999985 38.6399994 38.0000000 36.2099991 33.3100014 29.4099998 68.2500000 64.8099976
75.5400009 63.3100014 62.0999985 59.0000000 54.1100006 47.5800018 39.5999985 30.8700008
36.9399986 36.4099998 38.0999985 38.6399994 38.0000000
xbadj1   =  -60.5400009 -57.2299995 -52.1899986 -51.1699982 -43.6899986 -48.0299988
```

```
-30.2500000 -24.5000000 -18.0000000 -10.9499998 -3.57999992 3.91000009 11.2799997
12.4899998 18.7800007 21.1800003 22.9400005 24.0000000 24.3299999 23.9200001 22.7800007
-17.0799999 -21.1200008 -27.5100002 -33.0600014 -37.5999985 -41.0000000 -43.1599998
-44.0000000 -43.5099983 -42.1500015 -49.4199982 -55.1899986 -59.2900009 -61.5800018
-62.0000000
ybadj1   =  -7.46999979 -14.7100000 -21.5000000 -28.3899994 -31.7999992 -35.2700005
-32.1699982 -31.3099995 -29.5000000 -26.7900009 -23.2700005 -19.0499992 -14.2399998
-8.86999989 -21.5000000 -14.7100000 -7.46999979 0.00000000E+00 7.46999979 14.7100000
21.5000000 28.3899994 31.7999992 35.2799988 32.1699982 31.3099995 29.5000000 26.7900009
23.2700005 19.0499992 14.2399998 8.86999989 21.5000000 14.7100000 7.46999979 0.00000000E+00

pt. source: BF2A              number:  4
qstak    =  3194.00000
bwidth   =  54.1100006 36.5699997 35.1800003 32.7200012 33.6100006 36.4099998 38.0999985
38.6399994 38.0000000 36.2099991 33.3100014 66.2900009 62.6500015 59.9799995 62.5999985
63.3100014 62.0999985 59.0000000 54.1100006 36.5699997 35.1800003 32.7200012 33.6100006
36.4099998 38.0999985 38.6399994 38.0000000 36.2099991 33.3100014 66.2900009 62.6500015
59.9799995 62.5999985 63.3100014 62.0999985 59.0000000
bht      =  14.3999996 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000
16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 14.3999996 14.3999996 14.3999996
14.3999996 14.3999996 14.3999996 14.3999996 16.0000000 16.0000000 16.0000000 16.0000000
16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 14.3999996 14.3999996
14.3999996 14.3999996 14.3999996 14.3999996 14.3999996
bln1     =  67.4899979 33.3100014 29.4099998 24.6100006 22.4400005 27.1800003 31.0900002
34.0600014 36.0000000 36.8400002 36.5699997 39.5999985 30.8700008 36.9399986 46.2900009
54.2400017 60.5400009 65.0000000 67.4899979 33.3100014 29.4099998 24.6100006 22.4400005
27.1800003 31.0900002 34.0600014 36.0000000 36.8400002 36.5699997 39.5999985 30.8700008
36.9399986 46.2900009 54.2400017 60.5400009 65.0000000
xbadj1   =  -34.4099998 -37.7700005 -39.9799995 -40.9799995 -42.0400009 -45.9399986
-48.4399986 -49.4700012 -49.0000000 -47.0400009 -43.6500015 -38.9399986 -33.0400009
-31.9500008 -34.3100014 -35.6300011 -35.8600006 -35.0000000 -33.0800018 4.44999981
10.5699997 16.3700008 19.6000004 18.7600002 17.3500004 15.4099998 13.0000000 10.1999998
7.09000015 -0.660000026 2.17000008 -4.98000002 -11.9799995 -18.6100006 -24.6800003
-30.0000000
ybadj1   =  19.9899998 25.3700008 21.3500004 16.6800003 11.8199997 6.21999979 0.439999998
-5.36000013 -11.0000000 -16.2999992 -21.1100006 -6.82999992 -9.65999985 -12.0500002
-14.6400003 -16.7800007 -18.4200001 -19.5000000 -19.9899998 -25.3700008 -21.3500004
-16.6800003 -11.8199997 -6.21999979 -0.439999998 5.36000013 11.0000000 16.2999992
21.1100006 6.82999992 9.65999985 12.0500002 14.6400003 16.7800007 18.4200001 19.5000000

pt. source: BF2B              number:  5
qstak    =  3194.00000
bwidth   =  54.1100006 47.5800018 39.5999985 128.740005 33.6100006 36.4099998 38.0999985
38.6399994 38.0000000 36.2099991 33.3100014 29.4099998 62.6500015 59.9799995 62.5999985
63.3100014 62.0999985 59.0000000 54.1100006 47.5800018 39.5999985 128.740005 33.6100006
36.4099998 38.0999985 38.6399994 38.0000000 36.2099991 33.3100014 29.4099998 62.6500015
59.9799995 62.5999985 63.3100014 62.0999985 59.0000000
bht      =  14.3999996 14.3999996 14.3999996 12.8000002 16.0000000 16.0000000 16.0000000
16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 14.3999996 14.3999996 14.3999996
14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 12.8000002 16.0000000
16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 14.3999996
14.3999996 14.3999996 14.3999996 14.3999996 14.3999996
bln1     =  67.4899979 67.9199982 66.2900009 68.2500000 22.4400005 27.1800003 31.0900002
34.0600014 36.0000000 36.8400002 36.5699997 35.1800003 30.8700008 36.9399986 46.2900009
54.2400017 60.5400009 65.0000000 67.4899979 67.9199982 66.2900009 68.2500000 22.4400005
27.1800003 31.0900002 34.0600014 36.0000000 36.8400002 36.5699997 35.1800003 30.8700008
36.9399986 46.2900009 54.2400017 60.5400009 65.0000000
```

```
xbadj1   =  -28.3799992 -32.9000015 -36.4199982 -44.4300003 -41.3699989 -46.7700005
-50.7400017 -53.1800003 -54.0000000 -53.1800003 -50.7400017 -46.7700005 -41.3699989
-40.5299988 -42.8699989 -43.9099998 -43.6199989 -42.0000000 -39.0999985 -35.0200005
-29.8700008 -23.8199997 18.9300003 19.5900002 19.6499996 19.1200008 18.0000000 16.3400002
14.1800003 11.5900002 10.5000000 3.58999991 -3.42000008 -10.3299999 -16.9200001 -23.0000000
ybadj1   =  26.1200008 26.9599991 26.9699993 24.2500000 20.3999996 14.7900000 8.72000027
2.40000010 -4.00000000 -10.2799997 -16.2399998 -21.7099991 -7.51000023 -11.3800001
-15.4700003 -19.0900002 -22.1299992 -24.5000000 -26.1200008 -26.9599991 -26.9699993
-24.2500000 -20.3999996 -14.7900000 -8.72000027 -2.40000010 4.00000000 10.2799997
16.2399998 21.7099991 7.51000023 11.3800001 15.4700003 19.0900002 22.1299992 24.5000000

pt. source: BF2C             number:  6
qstak    =  3194.00000
bwidth   =  54.1100006 127.559998 130.130005 128.740005 131.289993 36.4099998 38.0999985
38.6399994 38.0000000 36.2099991 33.3100014 29.4099998 62.6500015 59.9799995 62.5999985
63.3100014 62.0999985 59.0000000 54.1100006 127.559998 130.130005 128.740005 131.289993
36.4099998 38.0999985 38.6399994 38.0000000 36.2099991 33.3100014 29.4099998 62.6500015
59.9799995 62.5999985 63.3100014 62.0999985 59.0000000
bht      =  14.3999996 12.8000002 12.8000002 12.8000002 12.8000002 16.0000000 16.0000000
16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 14.3999996 14.3999996
14.3999996 14.3999996 14.3999996 14.3999996 14.3999996 12.8000002 12.8000002 12.8000002
16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 16.0000000 14.3999996
14.3999996 14.3999996 14.3999996 14.3999996 14.3999996
bln1     =  67.4899979 89.5199966 80.0999985 68.2500000 64.8099976 27.1800003 31.0900002
34.0600014 36.0000000 36.8400002 36.5699997 35.1800003 30.8700008 36.9399986 46.2900009
54.2400017 60.5400009 65.0000000 67.4899979 89.5199966 80.0999985 68.2500000 64.8099976
27.1800003 31.0900002 34.0600014 36.0000000 36.8400002 36.5699997 35.1800003 30.8700008
36.9399986 46.2900009 54.2400017 60.5400009 65.0000000
xbadj1   =  -24.3299999 -51.5099983 -48.4000015 -43.8100014 -46.8199997 -48.5999985
-53.7299995 -57.2400017 -59.0000000 -58.9700012 -57.1500015 -53.5999985 -48.4099998
-47.5699997 -49.7000008 -50.3199997 -49.4099998 -47.0000000 -43.1599998 -38.0099983
-31.7000008 -24.4300003 -18.0000000 21.4200001 22.6399994 23.1700001 23.0000000 22.1299992
20.5900002 18.4200001 17.5400009 10.6400003 3.41000009 -3.92000008 -11.1300001 -18.0000000
ybadj1   =  31.9200001 36.6100006 34.4799995 31.2999992 28.2600002 21.6200008 15.1300001
8.18999958 1.00000000 -6.21999979 -13.2500000 -19.8799992 -6.88999987 -11.9899998
-17.2999992 -22.0799999 -26.1900005 -29.5000000 -31.9200001 -36.6100006 -34.4799995
-31.2999992 -28.2600002 -21.6200008 -15.1300001 -8.18999958 -1.00000000 6.21999979
13.2500000 19.8799992 6.88999987 11.9899998 17.2999992 22.0799999 26.1900005 29.5000000

--------------  INPUT GROUP 14  ---------------

nar1     =  0
iaru     =  5   units =   OUV/s/m^2
   converted to g/s/m^2, odour_units*m/s,
   or Bq/s/m^2  by factor:  1.00000000
nsar1    =  0
nar2     =  0


--------------  INPUT GROUP 15  ---------------

nln2     =  0
nlines   =  0
ilnu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nsln1    =  0
```

```
xl       =  0.00000000E+00
hbl      =  0.00000000E+00
wbl      =  0.00000000E+00
wml      =  0.00000000E+00
dxl      =  0.00000000E+00
fprimel  =  0.00000000E+00
mxnseg     =  7
nlrise   =  6


--------------  INPUT GROUP 16  ---------------

nvl1     =  6
ivlu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nsvl1    =  0
nvl2     =  0

cnamvl1  =
xvl1grd  =  74.1600037 74.2449951 74.4349670 74.5150757 74.4300842 74.3449402
yvl1grd  =  75.5297852 75.4516602 75.2514648 75.1660156 75.4614258 75.3515625
htvl1    =  6.40000010 6.40000010 6.40000010 6.40000010 7.19999981 8.00000000
elvl1    =  385.000000 385.000000 385.000000 385.000000 385.000000 385.000000
sy0vl1   =  5.19999981 5.19999981 5.19999981 5.19999981 7.40000010 7.40000010
sz0vl1   =  6.00000000 6.00000000 6.00000000 6.00000000 6.69999981 6.00000000

volume source: HTST              number:  1
qvl1     =  193.000000

volume source: HTPR              number:  2
qvl1     =  897.000000

volume source: CTPR              number:  3
qvl1     =  1242.00000

volume source: CTST              number:  4
qvl1     =  193.000000

volume source: LB                number:  5
qvl1     =  10943.0000

volume source: MILL              number:  6
qvl1     =  0.00000000E+00

--------------  INPUT GROUP 17  ---------------

nfl2     =  0

--------------  INPUT GROUP 18  ---------------

nrd1     =  0
nrd2     =  0
nsfrds   =  0


--------------  INPUT GROUP 20  ---------------
```

```
nrec     =  0
nrgrp    =  0



------------------------------------------------------------------------------------------
-------------------------------------
         INPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.INP         1
 prp_src2_RP_janfebcalpuff.inp

(CALMET Domain: 1 )  MASTER
  CALMET.DAT       100
  janfebcalmet.dat




------------------------------------------------------------------------------------------
-------------------------------------
         OUTPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.LST         2
 prp_src2_rp_janfebcalpuff.lst

    CONC.DAT         8
    prp_src2_rp_janfebcalpuff.con



SETNEST: Setup results for nested CALMET grids
----------------------------------------------

Properties of each CALMET domain grid

  Domain      =  1
  Origin(m)   =  279073.000 6546008.00
nx,ny,cell(m) =  150 150 200.000000
  Nest Factor =  1
Offset nx0,ny0=  0.00000000E+00 0.00000000E+00
Corner coordinates in outermost grid units:
  LL Corner   =  0.00000000E+00 0.00000000E+00
  UR Corner   =  150.000000 150.000000
Horizontal splitting parameters for domain:
  SYSPLITH(m) =  200.000000
SHSPLITH(m/s) =  0.111111112


------------------------------------------

            REVISED CONTROL DATA
```

```
         Running All Met Periods

-------------  INPUT GROUP 1  ---------------

metrun  =  1
ibyr    =  2017
ibmo    =  1
ibdy    =  1
ibhr    =  0
ibsec   =  0
nsecdt  =  3600
irlg    =  1416
ibdathr =  201700100
iedathr =  201706000
iesec   =  0

(End-times in other data files are NOT checked)

-------------------------------------------


 LAST PERIOD PROCESSED ENDS AT:
      Year: 2017  Month:  3   Day:  1   Julian day:  60   Hour:  0   Second:    0


 End of run -- Clock time: 15:55:52
                   Date: 01-10-2019

       Elapsed Clock Time:    16805.0 (seconds)

                  CPU Time:    16234.6 (seconds)
```

CALPUFF Version: 7.2.1 Level: 150618

****

Clock time: 13:09:20
Date: 01-15-2019

Internal Coordinate Transformations by --- COORDLIB Version: 1.99 Level: 070921

Control File Type: CALPUFF.INP 7.0 Groups 0f,0g added; new emission scaling

Run Title:
CALPUFF Demonstration Run
(Not intended as a guide for configuring options)
prp_src9_lb_janfeb

**** CONFIRMATION OF CONTROL DATA ****

---------- INPUT GROUP 1 ----------

metrun = 1
ibyr = 0
ibmo = 0
ibdy = 0
ibhr = 0
ibsec = 0
ibdathr = 0
ieyr = 2017
iemo = 3
iedy = 1
iehr = 0
iesec = 0
iedathr = 0
nsecdt = 3600
irlg = 0
iavg = 1
xbtz = -10.0000000
abtz = UTC+1000
nspec = 1
nse = 1
itest = 2
metfm = 1
mprffm = 1
mrestart= 0
nrespd = 0
avet = 60.0000000
pgtime = 60.0000000
ioutu = 2

```
--------------  INPUT GROUP 2  ---------------

mgauss =  1
mctadj =  3
mctsg  =  0
mslug  =  0
mtrans =  1
mchem  =  0
maqchem =  0
mlwc   =  0
mwet   =  0
mdry   =  0
mtilt  =  0
mdisp  =  2
mdisp2 =  3
mturbvw =  3
mtauly =  0.00000000E+00
mtauadv=  0
mcturb =  1
mrough =  0
mtip   =  1
mbdw   =  2
mshear =  0
mrise  =  1
mrise_fl=  2
mtip_fl=  0
msplit =  0
mpartl =  1
mpartlba=  1
mtinv  =  0
mpdf   =  1
msgtibl=  0
mbcon  =  0
msource=  0
mfog   =  0
mreg   =  0

--------------  INPUT GROUP 3  ---------------

SPECIES: ODOR          j: 1  isplst(-,j) =   1  1  0  GROUP: ODOR

--------------  INPUT GROUP 4  ---------------

pmap    = UTM
datum   = WGS-84
daten   = 02-21-2003
utmhem  = S
iutmzn  =  56
nx      =  150
ny      =  150
nz      =  11
zface  =  0.00000000E+00 20.0000000 40.0000000 80.0000000 160.000000 320.000000 640.000000
1000.00000 1500.00000 2000.00000 2500.00000 3000.00000
dgridkm =  0.200000003
xorigkm =  279.072998
yorigkm =  6546.00781
iutmzn  =  56
```

```
ibcomp  =  50
jbcomp  =  50
iecomp  =  100
jecomp  =  100
lsamp   =  T
ibsamp  =  64
jbsamp  =  64
iesamp  =  86
jesamp  =  86
meshdn  =  4

--------------  INPUT GROUP 5  ---------------

icon    =  1
idry    =  0
iwet    =  0
it2d    =  0
irho    =  0
ivis    =  0
lcomprs =  T
icprt   =  0
idprt   =  0
iwprt   =  0
icfrq   =  0
idfrq   =  0
iwfrq   =  0
(note:  i_frq values converted to timesteps)
iprtu   =  5
imesg   =  2
imflx   =  0
imbal   =  0
inrise  =  0
iqaplot =  1
ipftrak =  0
ldebug  =  F
ipfdeb  =  1
npfdeb  =  1
nn1     =  1
nn2     =  10

GROUP: ODOR          j:   1  ioutop(-,j) =  0 1 0 0 0 0 0

--------------  INPUT GROUP 6  ---------------

        ------  Subgroup (6a)  ------

nhill  =  0
nctrec =  0
mhill  =  2
xhill2m=  1.00000000
zhill2m=  1.00000000
xctdmkm=  0.00000000E+00
yctdmkm=  0.00000000E+00

        ------  Subgroup (6b)  ------
```

```
        ------  Subgroup (6c)  ------


--------------  INPUT GROUP 7  ---------------

SPECIES: ODOR          j:   1  dryg(-,j) =    -999.00   -999.00   -999.00   -999.00   -999.00

--------------  INPUT GROUP 8  ---------------

SPECIES: ODOR          j:   1  dryp(-,j) =    -999.00   -999.00

--------------  INPUT GROUP 9  ---------------

rcutr   =  30.0000000
rgr     =  10.0000000
reactr  =  8.00000000
pconst  =  2.30000001E-08
bmin    =  1.00000001E-07
bmax    =  2.49999994E-06
qswmax  =  600.000000
dconst1 =  2.00000000
dconst2 =  0.666666687
dconst3 =  4.79999988E-04
dconst4 =  0.666666687
nint    =  9
iveg    =  1

--------------  INPUT GROUP 10  ---------------

SPECIES: ODOR          j:   1  wa(-,j) =  0.000E+00   0.000E+00

--------------  INPUT GROUP 11  ---------------

moz      =  0
bcko3m   =  80.0000000 80.0000000 80.0000000 80.0000000
         =  80.0000000 80.0000000 80.0000000 80.0000000
         =  80.0000000 80.0000000 80.0000000 80.0000000
mnh3     =  0
mavgnh3  =  1
bcknh3m  =  10.0000000 10.0000000 10.0000000 10.0000000
         =  10.0000000 10.0000000 10.0000000 10.0000000
         =  10.0000000 10.0000000 10.0000000 10.0000000
rnite1   =  0.200000003
rnite2   =  2.00000000
rnite3   =  2.00000000
mh2o2    =  1
bckh2o2m =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
rh_isrp  =  50.0000000
so4_isrp =  4.00000005E-07
bckpmf   =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
ofrac    =  0.150000006 0.150000006 0.200000003 0.200000003
         =  0.200000003 0.200000003 0.200000003 0.200000003
         =  0.200000003 0.200000003 0.200000003 0.150000006
```

```
vcnx     =  50.0000000 50.0000000 50.0000000 50.0000000
         =  50.0000000 50.0000000 50.0000000 50.0000000
         =  50.0000000 50.0000000 50.0000000 50.0000000

--------------  INPUT GROUP 12  ---------------

sytdep   =  550.000000
mhftsz   =  0
jsup     =  5
conk1    =  9.99999978E-03
conk2    =  0.100000001
iurb1    =  10
iurb2    =  19

anemht   =  10.0000000
isigmav  =  1
imixctdm =  0
ilanduin =  20
z0in     =  0.250000000
xlaiin   =  3.00000000
elevin   =  0.00000000E+00
xlatin   =  -999.000000
xlonin   =  -999.000000

xmxlen   =  1.00000000
mxnew    =  99
xsamlen  =  1.00000000
mxsam    =  99
ncount   =  2
sl2pf    =  10.0000000
wscalm   =  0.499994993
cdiv     =  0.00000000E+00 0.00000000E+00

tkcat    =  265.000000   top for class 1
tkcat    =  270.000000   top for class 2
tkcat    =  275.000000   top for class 3
tkcat    =  280.000000   top for class 4
tkcat    =  285.000000   top for class 5
tkcat    =  290.000000   top for class 6
tkcat    =  295.000000   top for class 7
tkcat    =  300.000000   top for class 8
tkcat    =  305.000000   top for class 9
tkcat    =  310.000000   top for class 10
tkcat    =  315.000000   top for class 11

wscat    =  1.53999996   top for class 1
wscat    =  3.08999991   top for class 2
wscat    =  5.13999987   top for class 3
wscat    =  8.22999954   top for class 4
wscat    =  10.8000002   top for class 5

Over LAND
svmin    =  0.200000003  for stability 1
svmin    =  0.200000003  for stability 2
svmin    =  0.200000003  for stability 3
svmin    =  0.200000003  for stability 4
svmin    =  0.200000003  for stability 5
```

```
svmin    =  0.200000003  for stability 6
swmin    =  0.200000003  for stability 1
swmin    =  0.119999997  for stability 2
swmin    =  7.99999982E-02  for stability 3
swmin    =  5.99999987E-02  for stability 4
swmin    =  2.99999993E-02  for stability 5
swmin    =  1.60000008E-02  for stability 6

Over WATER
svmin    =  0.200000003  for stability 1
svmin    =  0.200000003  for stability 2
svmin    =  0.200000003  for stability 3
svmin    =  0.200000003  for stability 4
svmin    =  0.200000003  for stability 5
svmin    =  0.200000003  for stability 6
swmin    =  0.200000003  for stability 1
swmin    =  0.119999997  for stability 2
swmin    =  7.99999982E-02  for stability 3
swmin    =  5.99999987E-02  for stability 4
swmin    =  2.99999993E-02  for stability 5
swmin    =  1.60000008E-02  for stability 6

symin    =  1.00000000
szmin    =  1.00000000
szcap_m  =  5000000.00
xminzi   =  50.0000000
xmaxzi   =  3000.00000

plx0     =  7.00000003E-02    for stability 1
plx0     =  7.00000003E-02    for stability 2
plx0     =  0.100000001    for stability 3
plx0     =  0.150000006    for stability 4
plx0     =  0.349999994    for stability 5
plx0     =  0.550000012    for stability 6

ptg0     =  1.99999996E-02    for stability 5
ptg0     =  3.50000001E-02    for stability 6

ppc      =  0.500000000    for stability 1
ppc      =  0.500000000    for stability 2
ppc      =  0.500000000    for stability 3
ppc      =  0.500000000    for stability 4
ppc      =  0.349999994    for stability 5
ppc      =  0.349999994    for stability 6
tbd      =  0.500000000
tibldist =  1.00000000 10.0000000 9.00000000
nlutibl  =  4
fclip    =  0.00000000E+00
nsplit   =  3
iresplit =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 1 0 0
         =  0 0 0 0
zisplit  =  100.000000
roldmax  =  0.250000000
```

```
nsplith  =  5
sysplith =  1.00000000
shsplith =  2.00000000
cnsplith =  1.00000001E-07
epsslug  =  9.99999975E-05
epsarea  =  9.99999997E-07
dsrise   =  1.00000000
trajincl =  20.0000000
mdepbc   =  1
htminbc  =  500.000000
rsampbc  =  10.0000000

--------------  INPUT GROUP 13  ---------------

npt1     =  6
iptu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nspt1    =  6
npt2     =  0

cnampt1  = LB1             LB2             LB3             LB4             LB5
LB6
xpt1grd  =  73.3149719 73.2650757 73.2249451 73.3650208 73.3200073 73.2850647
ypt1grd  =  75.7397461 75.6958008 75.6616211 75.6860352 75.6420898 75.6054688
htstak   =  13.0000000 13.0000000 13.0000000 13.0000000 13.0000000 13.0000000
elstak   =  385.000000 385.000000 385.000000 385.000000 385.000000 385.000000
diam     =  1.88000000 1.88000000 1.88000000 1.88000000 1.88000000 1.88000000
exitw    =  15.0000000 15.0000000 15.0000000 15.0000000 15.0000000 15.0000000
tstak    =  293.149994 293.149994 293.149994 293.149994 293.149994 293.149994
idownw   =  1 1 1 1 1 1
syipt1   =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00
szipt1   =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00
fmfpt1   =  1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
zplatpt1 =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00

pt. source: LB1               number:  1
qstak    =  1.00000000
bwidth   =  412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -315.000000 -258.429993 -194.000000 -123.680000 -80.0999985 -81.4899979
```

-80.4000015 -76.8700027 -71.0000000 -62.9799995 -53.0400009 -41.4900017 -28.6800003
-17.7399998 -20.2800007 -22.2099991 -23.4599991 -24.0000000 -23.8099995 -22.8899994
-21.2800007 -19.0300007 -42.4900017 -114.910004 -183.830002 -247.169998 -303.000000
-349.619995 -385.619995 -409.910004 -421.730011 -430.929993 -433.000000 -421.910004
-398.000000 -362.000000
ybadj1 = -143.320007 -166.289993 -184.210007 -196.529999 -206.600006 -206.360001
-199.850006 -187.270004 -169.000000 -145.589996 -117.769997 -86.3600006 -52.3300018
-18.8099995 16.7099991 51.7200012 85.1500015 116.000000 143.320007 166.289993 184.210007
196.529999 206.600006 206.360001 199.850006 187.270004 169.000000 145.589996 117.769997
86.3600006 52.3300018 18.8099995 -16.7099991 -51.7200012 -85.1500015 -116.000000
ODOR Emission Factor Type: HOUR24
Index 1 to 24 Emission Factor = 0.00000000E+00 0.00000000E+00 4025.00000 8050.00000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 8050.00000 4025.00000
0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: LB2 number: 2
qstak = 1.00000000
bwidth = 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht = 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1 = 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1 = -304.399994 -246.550003 -181.210007 -110.360001 -66.6600037 -68.3300018
-67.9199982 -65.4599991 -61.0000000 -54.6899986 -46.7200012 -37.3300018 -26.7999992
-18.2099991 -23.0799999 -27.2500000 -30.5900002 -33.0000000 -34.4099998 -34.7700005
-34.0800018 -32.3499985 -55.9300003 -128.070007 -196.309998 -258.579987 -313.000000
-357.910004 -391.940002 -414.070007 -423.609985 -430.470001 -430.209991 -416.869995
-390.880005 -353.000000
ybadj1 = -151.610001 -172.610001 -188.369995 -198.399994 -206.130005 -203.559998
-194.809998 -180.139999 -160.000000 -134.990005 -105.889999 -73.5599976 -39.0000000
-5.36000013 29.8700008 64.1900024 96.5599976 126.000000 151.610001 172.610001 188.369995
198.399994 206.130005 203.559998 194.809998 180.139999 160.000000 134.990005 105.889999
73.5599976 39.0000000 5.36000013 -29.8700008 -64.1900024 -96.5599976 -126.000000
ODOR Emission Factor Type: HOUR24
Index 1 to 24 Emission Factor = 0.00000000E+00 0.00000000E+00 4025.00000 8050.00000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 8050.00000 4025.00000
0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: LB3 number: 3
qstak = 1.00000000
bwidth = 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000

```
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -296.119995 -237.229996 -171.139999 -99.8499985 -56.0299988 -57.9000015
-58.0099983 -56.3600006 -53.0000000 -48.0299988 -41.5999985 -33.9000015 -25.1700001
-18.4300003 -25.1399994 -31.0900002 -36.0900002 -40.0000000 -42.6899986 -44.0900002
-44.1399994 -42.8499985 -66.5599976 -138.490005 -206.220001 -267.679993 -321.000000
-364.570007 -397.070007 -417.489990 -425.239990 -430.250000 -428.140015 -413.029999
-385.369995 -346.000000
ybadj1   =  -158.270004 -177.729996 -191.800003 -200.029999 -205.910004 -201.500000
-190.970001 -174.639999 -153.000000 -126.709999 -96.5699997 -63.5000000 -28.5000000
5.26999998 40.2999992 74.0999985 105.660004 134.000000 158.270004 177.729996 191.800003
200.029999 205.910004 201.500000 190.970001 174.639999 153.000000 126.709999 96.5699997
63.5000000 28.5000000 -5.26999998 -40.2999992 -74.0999985 -105.660004 -134.000000
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  0.00000000E+00 0.00000000E+00 4025.00000 8050.00000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 8050.00000 4025.00000
0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: LB4               number:  4
qstak    =  1.00000000
bwidth   =  412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -305.899994 -251.509995 -189.470001 -121.680000 -80.6900024 -84.6500015
-86.0299988 -84.8099976 -81.0000000 -74.7300034 -66.1999969 -55.6500015 -43.4099998
-32.5999985 -34.8100014 -35.9700012 -36.0299988 -35.0000000 -32.9099998 -29.8099995
-25.8099995 -21.0300007 -41.9000015 -111.750000 -178.199997 -239.229996 -293.000000
-337.859985 -372.459991 -395.750000 -407.000000 -416.079987 -418.470001 -408.149994
-385.429993 -351.000000
ybadj1   =  -131.570007 -153.130005 -170.050003 -181.800003 -191.740005 -191.830002
-186.089996 -174.699997 -158.000000 -136.500000 -110.849998 -81.8300018 -50.3300018
-19.3999996 13.5500002 46.0800018 77.2099991 106.000000 131.570007 153.130005 170.050003
181.800003 191.740005 191.830002 186.089996 174.699997 158.000000 136.500000 110.849998
81.8300018 50.3300018 19.3999996 -13.5500002 -46.0800018 -77.2099991 -106.000000
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  0.00000000E+00 0.00000000E+00 4025.00000 8050.00000
```

```
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 8050.00000 4025.00000
0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: LB5               number:  5
qstak    =  1.00000000
bwidth   =  412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -295.480011 -239.970001 -177.179993 -109.000000 -68.0100021 -72.3499985
-74.5000000 -74.3799973 -72.0000000 -67.4300003 -60.8199997 -52.3499985 -42.2999992
-33.7099991 -38.1100006 -41.3499985 -43.3300018 -44.0000000 -43.3300018 -41.3499985
-38.1100006 -33.7099991 -54.5800018 -124.040001 -189.729996 -249.660004 -302.000000
-345.170013 -377.839996 -399.040009 -408.109985 -414.970001 -415.179993 -402.779999
-378.130005 -342.000000
ybadj1   =  -138.869995 -158.509995 -173.339996 -182.910004 -190.630005 -188.539993
-180.710007 -167.399994 -149.000000 -126.070000 -99.3099976 -69.5400009 -37.6500015
-6.71999979 25.8400002 57.6199989 87.6399994 115.000000 138.869995 158.509995 173.339996
182.910004 190.630005 188.539993 180.710007 167.399994 149.000000 126.070000 99.3099976
69.5400009 37.6500015 6.71999979 -25.8400002 -57.6199989 -87.6399994 -115.000000
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  0.00000000E+00 0.00000000E+00 4025.00000 8050.00000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 8050.00000 4025.00000
0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: LB6               number:  6
qstak    =  1.00000000
bwidth   =  412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -287.369995 -231.000000 -167.619995 -99.1399994 -58.1500015 -62.7900009
-65.5299988 -66.2699966 -65.0000000 -61.7599983 -56.6300011 -49.7900009 -41.4399986
```

```
-34.5699997 -40.6699982 -45.5299988 -49.0099983 -51.0000000 -51.4399986 -50.3199997
-47.6699982 -43.5699997 -64.4400024 -133.600006 -198.699997 -257.769989 -309.000000
-350.839996 -382.029999 -401.600006 -408.970001 -414.109985 -412.619995 -398.589996
-372.450012 -335.000000
ybadj1   =  -144.539993 -162.699997 -175.910004 -183.770004 -189.770004 -185.979996
-176.529999 -161.720001 -142.000000 -117.959999 -90.3399963 -59.9799995 -27.7900009
3.15000010 35.4099998 66.5899963 95.7500000 122.000000 144.539993 162.699997 175.910004
183.770004 189.770004 185.979996 176.529999 161.720001 142.000000 117.959999 90.3399963
59.9799995 27.7900009 -3.15000010 -35.4099998 -66.5899963 -95.7500000 -122.000000
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  0.00000000E+00 0.00000000E+00 4025.00000 8050.00000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000
12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 12075.0000 8050.00000 4025.00000
0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

--------------  INPUT GROUP 14  ---------------

nar1     =  0
iaru     =  5   units =   OUV/s/m^2
   converted to g/s/m^2, odour_units*m/s,
   or Bq/s/m^2  by factor:  1.00000000
nsar1    =  0
nar2     =  0


--------------  INPUT GROUP 15  ---------------

nln2     =  0
nlines   =  0
ilnu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nsln1    =  0
xl       =  0.00000000E+00
hbl      =  0.00000000E+00
wbl      =  0.00000000E+00
wml      =  0.00000000E+00
dxl      =  0.00000000E+00
fprimel  =  0.00000000E+00
mxnseg     =  7
nlrise   =  6


--------------  INPUT GROUP 16  ---------------

nvl1     =  0
ivlu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nsvl1    =  0
nvl2     =  0


--------------  INPUT GROUP 17  ---------------

nfl2     =  0
```

```
--------------  INPUT GROUP 18  ---------------

nrd1     =  0
nrd2     =  0
nsfrds   =  0


--------------  INPUT GROUP 20  ---------------

nrec     =  0
nrgrp    =  0



------------------------------------------------------------------------------------------------------------
-------------------------------------
         INPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.INP         1
 prp_src9_lb_janfebcalpuff.inp

(CALMET Domain: 1 )  MASTER
  CALMET.DAT       100
  janfebcalmet.dat




------------------------------------------------------------------------------------------------------------
-------------------------------------
         OUTPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.LST         2
 prp_src9_lb_janfebcalpuff.lst

    CONC.DAT         8
    prp_src9_lb_janfebcalpuff.con



SETNEST: Setup results for nested CALMET grids
----------------------------------------------

Properties of each CALMET domain grid

  Domain      =  1
  Origin(m)   =  279073.000 6546008.00
nx,ny,cell(m) =  150 150 200.000000
  Nest Factor =  1
Offset nx0,ny0=  0.00000000E+00 0.00000000E+00
Corner coordinates in outermost grid units:
  LL Corner   =  0.00000000E+00 0.00000000E+00
  UR Corner   =  150.000000 150.000000
```

```
Horizontal splitting parameters for domain:
  SYSPLITH(m) =  200.000000
SHSPLITH(m/s) =  0.111111112


---------------------------------------------

           REVISED CONTROL DATA
         Running All Met Periods

-------------  INPUT GROUP 1  ---------------

metrun  =  1
ibyr    =  2017
ibmo    =  1
ibdy    =  1
ibhr    =  0
ibsec   =  0
nsecdt  =  3600
irlg    =  1416
ibdathr =  201700100
iedathr =  201706000
iesec   =  0

(End-times in other data files are NOT checked)

---------------------------------------------


 LAST PERIOD PROCESSED ENDS AT:
      Year: 2017  Month:  3   Day:  1   Julian day:  60   Hour:  0   Second:    0


 End of run -- Clock time: 16:16:08
                     Date: 01-15-2019

       Elapsed Clock Time:    11208.0 (seconds)

                  CPU Time:    10493.5 (seconds)
```

CALPUFF Version: 7.2.1 Level: 150618

****

Clock time: 18:03:02
Date: 09-29-2018

Internal Coordinate Transformations by --- COORDLIB Version: 1.99 Level: 070921

Control File Type: CALPUFF.INP 7.0 Groups 0f,0g added; new emission scaling

Run Title:
CALPUFF Demonstration Run
(Not intended as a guide for configuring options)
prp_src11_prcvents_janfeb

**** CONFIRMATION OF CONTROL DATA ****

---------- INPUT GROUP 1 ----------

metrun = 1
ibyr = 0
ibmo = 0
ibdy = 0
ibhr = 0
ibsec = 0
ibdathr = 0
ieyr = 2017
iemo = 3
iedy = 1
iehr = 0
iesec = 0
iedathr = 0
nsecdt = 3600
irlg = 0
iavg = 1
xbtz = -10.0000000
abtz = UTC+1000
nspec = 1
nse = 1
itest = 2
metfm = 1
mprffm = 1
mrestart= 0
nrespd = 0
avet = 60.0000000
pgtime = 60.0000000
ioutu = 2

```
--------------  INPUT GROUP 2  ---------------

mgauss =  1
mctadj =  3
mctsg  =  0
mslug  =  0
mtrans =  1
mchem  =  0
maqchem =  0
mlwc   =  0
mwet   =  0
mdry   =  0
mtilt  =  0
mdisp  =  2
mdisp2 =  3
mturbvw =  3
mtauly =  0.00000000E+00
mtauadv=  0
mcturb =  1
mrough =  0
mtip   =  1
mbdw   =  2
mshear =  0
mrise  =  1
mrise_fl=  2
mtip_fl=  0
msplit =  0
mpartl =  1
mpartlba=  1
mtinv  =  0
mpdf   =  1
msgtibl=  0
mbcon  =  0
msource=  0
mfog   =  0
mreg   =  0

--------------  INPUT GROUP 3  ---------------

SPECIES: ODOR          j: 1  isplst(-,j) =   1  1  0  GROUP: ODOR

--------------  INPUT GROUP 4  ---------------

pmap    = UTM
datum   = WGS-84
daten   = 02-21-2003
utmhem  = S
iutmzn  =  56
nx      =  150
ny      =  150
nz      =  11
zface  =  0.00000000E+00 20.0000000 40.0000000 80.0000000 160.000000 320.000000 640.000000
1000.00000 1500.00000 2000.00000 2500.00000 3000.00000
dgridkm =  0.200000003
xorigkm =  279.072998
yorigkm =  6546.00781
iutmzn  =  56
```

```
ibcomp  =  50
jbcomp  =  50
iecomp  =  100
jecomp  =  100
lsamp   =  T
ibsamp  =  64
jbsamp  =  64
iesamp  =  86
jesamp  =  86
meshdn  =  4

--------------  INPUT GROUP 5  ---------------

icon    =  1
idry    =  0
iwet    =  0
it2d    =  0
irho    =  0
ivis    =  0
lcomprs =  T
icprt   =  0
idprt   =  0
iwprt   =  0
icfrq   =  0
idfrq   =  0
iwfrq   =  0
(note:  i_frq values converted to timesteps)
iprtu   =  5
imesg   =  2
imflx   =  0
imbal   =  0
inrise  =  0
iqaplot =  1
ipftrak =  0
ldebug  =  F
ipfdeb  =  1
npfdeb  =  1
nn1     =  1
nn2     =  10

GROUP: ODOR          j:   1  ioutop(-,j) =  0 1 0 0 0 0 0

--------------  INPUT GROUP 6  ---------------

        ------  Subgroup (6a)  ------

nhill  =  0
nctrec =  0
mhill  =  2
xhill2m=  1.00000000
zhill2m=  1.00000000
xctdmkm=  0.00000000E+00
yctdmkm=  0.00000000E+00

        ------  Subgroup (6b)  ------
```

```
        ------  Subgroup (6c)  ------


--------------  INPUT GROUP 7  ---------------

SPECIES: ODOR          j:   1  dryg(-,j) =    -999.00   -999.00   -999.00   -999.00   -999.00

--------------  INPUT GROUP 8  ---------------

SPECIES: ODOR          j:   1  dryp(-,j) =    -999.00   -999.00

--------------  INPUT GROUP 9  ---------------

rcutr   =  30.0000000
rgr     =  10.0000000
reactr  =  8.00000000
pconst  =  2.30000001E-08
bmin    =  1.00000001E-07
bmax    =  2.49999994E-06
qswmax  =  600.000000
dconst1 =  2.00000000
dconst2 =  0.666666687
dconst3 =  4.79999988E-04
dconst4 =  0.666666687
nint    =  9
iveg    =  1

--------------  INPUT GROUP 10  ---------------

SPECIES: ODOR          j:   1  wa(-,j) =  0.000E+00   0.000E+00

--------------  INPUT GROUP 11  ---------------

moz      =  0
bcko3m   =  80.0000000 80.0000000 80.0000000 80.0000000
         =  80.0000000 80.0000000 80.0000000 80.0000000
         =  80.0000000 80.0000000 80.0000000 80.0000000
mnh3     =  0
mavgnh3  =  1
bcknh3m  =  10.0000000 10.0000000 10.0000000 10.0000000
         =  10.0000000 10.0000000 10.0000000 10.0000000
         =  10.0000000 10.0000000 10.0000000 10.0000000
rnite1   =  0.200000003
rnite2   =  2.00000000
rnite3   =  2.00000000
mh2o2    =  1
bckh2o2m =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
rh_isrp  =  50.0000000
so4_isrp =  4.00000005E-07
bckpmf   =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
         =  1.00000000 1.00000000 1.00000000 1.00000000
ofrac    =  0.150000006 0.150000006 0.200000003 0.200000003
         =  0.200000003 0.200000003 0.200000003 0.200000003
         =  0.200000003 0.200000003 0.200000003 0.150000006
```

```
vcnx     =  50.0000000 50.0000000 50.0000000 50.0000000
         =  50.0000000 50.0000000 50.0000000 50.0000000
         =  50.0000000 50.0000000 50.0000000 50.0000000

--------------  INPUT GROUP 12  ---------------

sytdep   =  550.000000
mhftsz   =  0
jsup     =  5
conk1    =  9.99999978E-03
conk2    =  0.100000001
iurb1    =  10
iurb2    =  19

anemht   =  10.0000000
isigmav  =  1
imixctdm =  0
ilanduin =  20
z0in     =  0.250000000
xlaiin   =  3.00000000
elevin   =  0.00000000E+00
xlatin   =  -999.000000
xlonin   =  -999.000000

xmxlen   =  1.00000000
mxnew    =  99
xsamlen  =  1.00000000
mxsam    =  99
ncount   =  2
sl2pf    =  10.0000000
wscalm   =  0.499994993
cdiv     =  0.00000000E+00 0.00000000E+00

tkcat    =  265.000000   top for class 1
tkcat    =  270.000000   top for class 2
tkcat    =  275.000000   top for class 3
tkcat    =  280.000000   top for class 4
tkcat    =  285.000000   top for class 5
tkcat    =  290.000000   top for class 6
tkcat    =  295.000000   top for class 7
tkcat    =  300.000000   top for class 8
tkcat    =  305.000000   top for class 9
tkcat    =  310.000000   top for class 10
tkcat    =  315.000000   top for class 11

wscat    =  1.53999996   top for class 1
wscat    =  3.08999991   top for class 2
wscat    =  5.13999987   top for class 3
wscat    =  8.22999954   top for class 4
wscat    =  10.8000002   top for class 5

Over LAND
svmin    =  0.200000003  for stability 1
svmin    =  0.200000003  for stability 2
svmin    =  0.200000003  for stability 3
svmin    =  0.200000003  for stability 4
svmin    =  0.200000003  for stability 5
```

```
svmin    =  0.200000003  for stability 6
swmin    =  0.200000003  for stability 1
swmin    =  0.119999997  for stability 2
swmin    =  7.99999982E-02  for stability 3
swmin    =  5.99999987E-02  for stability 4
swmin    =  2.99999993E-02  for stability 5
swmin    =  1.60000008E-02  for stability 6

Over WATER
svmin    =  0.200000003  for stability 1
svmin    =  0.200000003  for stability 2
svmin    =  0.200000003  for stability 3
svmin    =  0.200000003  for stability 4
svmin    =  0.200000003  for stability 5
svmin    =  0.200000003  for stability 6
swmin    =  0.200000003  for stability 1
swmin    =  0.119999997  for stability 2
swmin    =  7.99999982E-02  for stability 3
swmin    =  5.99999987E-02  for stability 4
swmin    =  2.99999993E-02  for stability 5
swmin    =  1.60000008E-02  for stability 6

symin    =  1.00000000
szmin    =  1.00000000
szcap_m  =  5000000.00
xminzi   =  50.0000000
xmaxzi   =  3000.00000

plx0     =  7.00000003E-02    for stability 1
plx0     =  7.00000003E-02    for stability 2
plx0     =  0.100000001    for stability 3
plx0     =  0.150000006    for stability 4
plx0     =  0.349999994    for stability 5
plx0     =  0.550000012    for stability 6

ptg0     =  1.99999996E-02    for stability 5
ptg0     =  3.50000001E-02    for stability 6

ppc      =  0.500000000    for stability 1
ppc      =  0.500000000    for stability 2
ppc      =  0.500000000    for stability 3
ppc      =  0.500000000    for stability 4
ppc      =  0.349999994    for stability 5
ppc      =  0.349999994    for stability 6
tbd      =  0.500000000
tibldist =  1.00000000 10.0000000 9.00000000
nlutibl  =  4
fclip    =  0.00000000E+00
nsplit   =  3
iresplit =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 1 0 0
         =  0 0 0 0
zisplit  =  100.000000
roldmax  =  0.250000000
```

```
nsplith  =  5
sysplith =  1.00000000
shsplith =  2.00000000
cnsplith =  1.00000001E-07
epsslug  =  9.99999975E-05
epsarea  =  9.99999997E-07
dsrise   =  1.00000000
trajincl =  20.0000000
mdepbc   =  1
htminbc  =  500.000000
rsampbc  =  10.0000000

--------------  INPUT GROUP 13  ---------------

npt1     =  6
iptu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nspt1    =  6
npt2     =  0

cnampt1  = DF1             DF2             EV1             EV2             AC1
AC2
xpt1grd  =  73.5949707 73.6549377 73.7699890 73.8299561 73.9599609 74.0100098
ypt1grd  =  75.2954102 75.3613281 75.1220703 75.1855469 74.9414062 75.0097656
htstak   =  13.0000000 13.0000000 13.0000000 13.0000000 13.0000000 13.0000000
elstak   =  385.000000 385.000000 385.000000 385.000000 385.000000 385.000000
diam     =  0.720000029 0.720000029 0.720000029 0.720000029 0.720000029 0.720000029
exitw    =  15.0000000 15.0000000 15.0000000 15.0000000 15.0000000 15.0000000
tstak    =  273.149994 273.149994 273.149994 273.149994 273.149994 273.149994
idownw   =  1 1 1 1 1 1
syipt1   =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00
szipt1   =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00
fmfpt1   =  1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
zplatpt1 =  0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00

pt. source: DF1               number:  1
qstak    =  3366.00000
bwidth   =  412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -237.070007 -193.949997 -144.919998 -91.5000000 -65.7900009 -85.4899979
```

-102.580002 -116.559998 -127.000000 -133.580002 -136.100006 -134.490005 -128.779999
-121.919998 -125.360001 -125.000000 -120.830002 -113.000000 -101.730003 -87.3700027
-70.3600006 -51.2099991 -56.7999992 -110.910004 -161.649994 -207.479996 -247.000000
-279.019989 -302.559998 -316.910004 -321.630005 -326.760010 -327.920013 -319.130005
-300.630005 -273.000000
ybadj1 = -72.7200012 -83.2300034 -91.2099991 -96.4199982 -102.419998 -101.279999
-97.0599976 -89.9000015 -80.0000000 -67.6699982 -53.2900009 -37.2799988 -20.1499996
-4.50000000 12.7100000 29.5300007 45.4599991 60.0000000 72.7200012 83.2300034 91.2099991
96.4199982 102.419998 101.279999 97.0599976 89.9000015 80.0000000 67.6699982 53.2900009
37.2799988 20.1499996 4.50000000 -12.7100000 -29.5300007 -45.4599991 -60.0000000
ODOR Emission Factor Type: HOUR24
Index 1 to 24 Emission Factor = 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00 0.00000000E+00 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: DF2 number: 2
qstak = 3366.00000
bwidth = 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht = 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1 = 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1 = -251.960007 -210.270004 -162.179993 -109.169998 -83.3399963 -102.379997
-118.300003 -130.639999 -139.000000 -143.139999 -142.929993 -138.380005 -129.619995
-119.669998 -120.099998 -116.879997 -110.120003 -100.000000 -86.8499985 -71.0500031
-53.0999985 -33.5400009 -39.2500000 -94.0199966 -145.929993 -193.399994 -235.000000
-269.459991 -295.730011 -313.019989 -320.790009 -329.010010 -333.179993 -327.239990
-311.350006 -286.000000
ybadj1 = -63.1599998 -76.4000015 -87.3199997 -95.5899963 -104.669998 -106.540001
-105.180000 -100.620003 -93.0000000 -82.5599976 -69.6100006 -54.5400009 -37.8199997
-22.0400009 -4.17999983 13.8100004 31.3799992 48.0000000 63.1599998 76.4000015 87.3199997
95.5899963 104.669998 106.540001 105.180000 100.620003 93.0000000 82.5599976 69.6100006
54.5400009 37.8199997 22.0400009 4.17999983 -13.8100004 -31.3799992 -48.0000000
ODOR Emission Factor Type: HOUR24
Index 1 to 24 Emission Factor = 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00 0.00000000E+00 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: EV1 number: 3
qstak = 3366.00000
bwidth = 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000

```
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -208.679993 -173.029999 -132.110001 -87.1900024 -70.1100006 -98.3000031
-123.500000 -144.949997 -162.000000 -174.130005 -180.960007 -182.300003 -178.089996
-171.229996 -173.169998 -169.860001 -161.380005 -148.000000 -130.119995 -108.290001
-83.1699982 -55.5200005 -52.4799995 -98.0999985 -140.729996 -179.089996 -212.000000
-238.470001 -257.700012 -269.100006 -272.320007 -277.450012 -280.109985 -274.269989
-260.079987 -238.000000
ybadj1   =  -32.1699982 -38.3699989 -43.4000015 -47.1100006 -53.1100006 -53.4700012
-52.2000008 -49.3499985 -45.0000000 -39.2799988 -32.3699989 -24.4699993 -15.8299999
-8.81000042 -0.100000001 8.60999966 17.0699997 25.0000000 32.1699982 38.3699989 43.4000015
47.1100006 53.1100006 53.4700012 52.2000008 49.3499985 45.0000000 39.2799988 32.3699989
24.4699993 15.8299999 8.81000042 0.100000001 -8.60999966 -17.0699997 -25.0000000
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00 0.00000000E+00 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: EV2               number:  4
qstak    =  3366.00000
bwidth   =  412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -223.570007 -189.350006 -149.369995 -104.860001 -87.6500015 -115.190002
-139.220001 -159.029999 -174.000000 -183.690002 -187.789993 -186.190002 -178.929993
-168.979996 -167.910004 -161.740005 -150.660004 -135.000000 -115.239998 -91.9700012
-65.9100037 -37.8499985 -34.9399986 -81.2099991 -125.010002 -165.009995 -200.000000
-228.910004 -250.869995 -265.209991 -271.480011 -279.700012 -285.369995 -282.380005
-270.799988 -251.000000
ybadj1   =  -22.6100006 -31.5400009 -39.5099983 -46.2799988 -55.3600006 -58.7299995
-60.3199997 -60.0699997 -58.0000000 -54.1699982 -48.6899986 -41.7299995 -33.5000000
-26.3600006 -16.9899998 -7.11000013 2.99000001 13.0000000 22.6100006 31.5400009 39.5099983
46.2799988 55.3600006 58.7299995 60.3199997 60.0699997 58.0000000 54.1699982 48.6899986
41.7299995 33.5000000 26.3600006 16.9899998 7.11000013 -2.99000001 -13.0000000
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  0.00000000E+00 0.00000000E+00 0.00000000E+00
```

```
0.00000000E+00 0.00000000E+00 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: AC1               number:  5
qstak    =  3366.00000
bwidth   =  412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
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12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -179.830002 -152.199997 -119.940002 -84.0299988 -76.0699997 -113.209999
-146.899994 -176.119995 -200.000000 -217.800003 -228.979996 -233.210007 -230.339996
-223.229996 -223.350006 -216.679993 -203.429993 -184.000000 -158.979996 -129.119995
-95.3499985 -58.6800003 -46.5200005 -83.1900024 -117.330002 -147.910004 -174.000000
-194.800003 -209.679993 -218.190002 -220.070007 -225.449997 -229.940002 -227.440002
-218.029999 -202.000000
ybadj1   =  11.5000000 9.64999962 7.51000023 5.13999987 -1.11000001 -3.28999996 -5.38000011
-7.30000019 -9.00000000 -10.4300003 -11.5400000 -12.2900000 -12.6800003 -14.7799997
-15.0100002 -14.7799997 -14.1000004 -13.0000000 -11.5000000 -9.64999962 -7.51000023
-5.13999987 1.11000001 3.28999996 5.38000011 7.30000019 9.00000000 10.4300003 11.5400000
12.2900000 12.6800003 14.7799997 15.0100002 14.7799997 14.1000004 13.0000000
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00 0.00000000E+00 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

pt. source: AC2               number:  6
qstak    =  3366.00000
bwidth   =  412.600006 438.660004 451.390015 450.410004 448.679993 453.290009 444.119995
421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996 196.389999
264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993
453.290009 444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007
122.589996 196.389999 264.230011 324.040009 374.000000
bht      =  12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
12.8000002 12.8000002 12.8000002 12.8000002 12.8000002
bln1     =  338.809998 281.320007 215.289993 142.710007 122.589996 196.389999 264.230011
324.040009 374.000000 412.600006 438.660004 451.390015 450.410004 448.679993 453.290009
444.119995 421.459991 386.000000 338.809998 281.320007 215.289993 142.710007 122.589996
196.389999 264.230011 324.040009 374.000000 412.600006 438.660004 451.390015 450.410004
448.679993 453.290009 444.119995 421.459991 386.000000
xbadj1   =  -195.350006 -168.770004 -137.059998 -101.190002 -92.7300034 -128.869995
-161.080002 -188.399994 -210.000000 -225.220001 -233.589996 -234.869995 -229.000000
```

```
-218.929993 -216.220001 -206.949997 -191.380005 -170.000000 -143.449997 -112.550003
-78.2200012 -41.5200005 -29.8600006 -67.5299988 -103.150002 -135.630005 -164.000000
-187.380005 -205.070007 -216.529999 -221.410004 -229.740005 -237.059998 -237.179993
-230.080002 -216.000000
ybadj1   =  18.9200001 14.2600002 9.17000008 3.79999995 -5.40999985 -10.4200001 -15.1099997
-19.3500004 -23.0000000 -25.9500008 -28.1100006 -29.4200001 -29.8299999 -31.4400005
-30.6700001 -28.9699993 -26.3799992 -23.0000000 -18.9200001 -14.2600002 -9.17000008
-3.79999995 5.40999985 10.4200001 15.1099997 19.3500004 23.0000000 25.9500008 28.1100006
29.4200001 29.8299999 31.4400005 30.6700001 28.9699993 26.3799992 23.0000000
ODOR        Emission Factor Type: HOUR24
Index  1  to  24  Emission Factor =  0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00 0.00000000E+00 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00

--------------  INPUT GROUP 14  ---------------

nar1     =  0
iaru     =  5   units =   OUV/s/m^2
   converted to g/s/m^2, odour_units*m/s,
   or Bq/s/m^2  by factor:  1.00000000
nsar1    =  0
nar2     =  0


--------------  INPUT GROUP 15  ---------------

nln2     =  0
nlines   =  0
ilnu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nsln1    =  0
xl       =  0.00000000E+00
hbl      =  0.00000000E+00
wbl      =  0.00000000E+00
wml      =  0.00000000E+00
dxl      =  0.00000000E+00
fprimel  =  0.00000000E+00
mxnseg     =  7
nlrise   =  6


--------------  INPUT GROUP 16  ---------------

nvl1     =  0
ivlu     =  5   units =   OUV/s
      converted to g/s, odour_units*m3/s, or Bq/s
      by factor:  1.00000000
nsvl1    =  0
nvl2     =  0


--------------  INPUT GROUP 17  ---------------

nfl2     =  0
```

```
--------------  INPUT GROUP 18  ---------------

nrd1     =  0
nrd2     =  0
nsfrds   =  0


--------------  INPUT GROUP 20  ---------------

nrec     =  0
nrgrp    =  0



------------------------------------------------------------------------------------------------------------
-------------------------------------
         INPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.INP         1
 prp_src11_prcvents_janfebcalpuff.inp

(CALMET Domain: 1 )  MASTER
  CALMET.DAT       100
  janfebcalmet.dat




------------------------------------------------------------------------------------------------------------
-------------------------------------
         OUTPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.LST         2
 prp_src11_prcvents_janfebcalpuff.lst

    CONC.DAT         8
    prp_src11_prcvents_janfebcalpuff.con



SETNEST: Setup results for nested CALMET grids
----------------------------------------------

Properties of each CALMET domain grid

  Domain      =  1
  Origin(m)   =  279073.000 6546008.00
nx,ny,cell(m) =  150 150 200.000000
  Nest Factor =  1
Offset nx0,ny0=  0.00000000E+00 0.00000000E+00
Corner coordinates in outermost grid units:
  LL Corner   =  0.00000000E+00 0.00000000E+00
  UR Corner   =  150.000000 150.000000
```

```
Horizontal splitting parameters for domain:
  SYSPLITH(m) =  200.000000
SHSPLITH(m/s) =  0.111111112


-------------------------------------------

           REVISED CONTROL DATA
         Running All Met Periods

-------------  INPUT GROUP 1  ---------------

metrun  =  1
ibyr    =  2017
ibmo    =  1
ibdy    =  1
ibhr    =  0
ibsec   =  0
nsecdt  =  3600
irlg    =  1416
ibdathr =  201700100
iedathr =  201706000
iesec   =  0

(End-times in other data files are NOT checked)

-------------------------------------------


 LAST PERIOD PROCESSED ENDS AT:
      Year: 2017  Month:  3   Day:  1   Julian day:  60   Hour:  0   Second:    0


 End of run -- Clock time: 20:53:37
                     Date: 09-29-2018

       Elapsed Clock Time:    10235.0 (seconds)

                  CPU Time:    10080.0 (seconds)
```