APPENDIX 4

Blast Management Plan

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OBERON QUARRY

BLAST MANAGEMENT PLAN

DRAFT

OCTOBER 2014

OBERON QUARRY

BLAST MANAGEMENT PLAN

DRAFT

October 2014

Prepared by
Umwelt (Australia) Pty Limited

on behalf of
Oberon Quarries Pty Ltd

Project Director:	**Peter Jamieson**
Project Manager:	**Brendan Rice**
Report No.	**1296/R36/V1**
Date:	**October 2014**

umwelt

Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

www.umwelt.com.au

TABLE OF CONTENTS

FIGURES

1.0 Introduction

1.1 Background

Oberon Quarries Pty Limited operates Oberon Quarry, an existing hard rock quarry located approximately 4 kilometres south of Oberon, New South Wales (NSW) (refer to **Figure 1.1**). The original Oberon Quarries Development Consent (DA92/164) (Development Consent) was granted on 1 October 1993 by the NSW Minister for Planning. Oberon Quarries has been operating at the site since 1995.

The existing Modification 5 Consolidated Development Consent allows for continued operations of the existing Oberon Quarry and enables the extraction of additional hard rock resources within the approved extraction area (refer to **Figure 1.1**).

1.2 Purpose and Scope

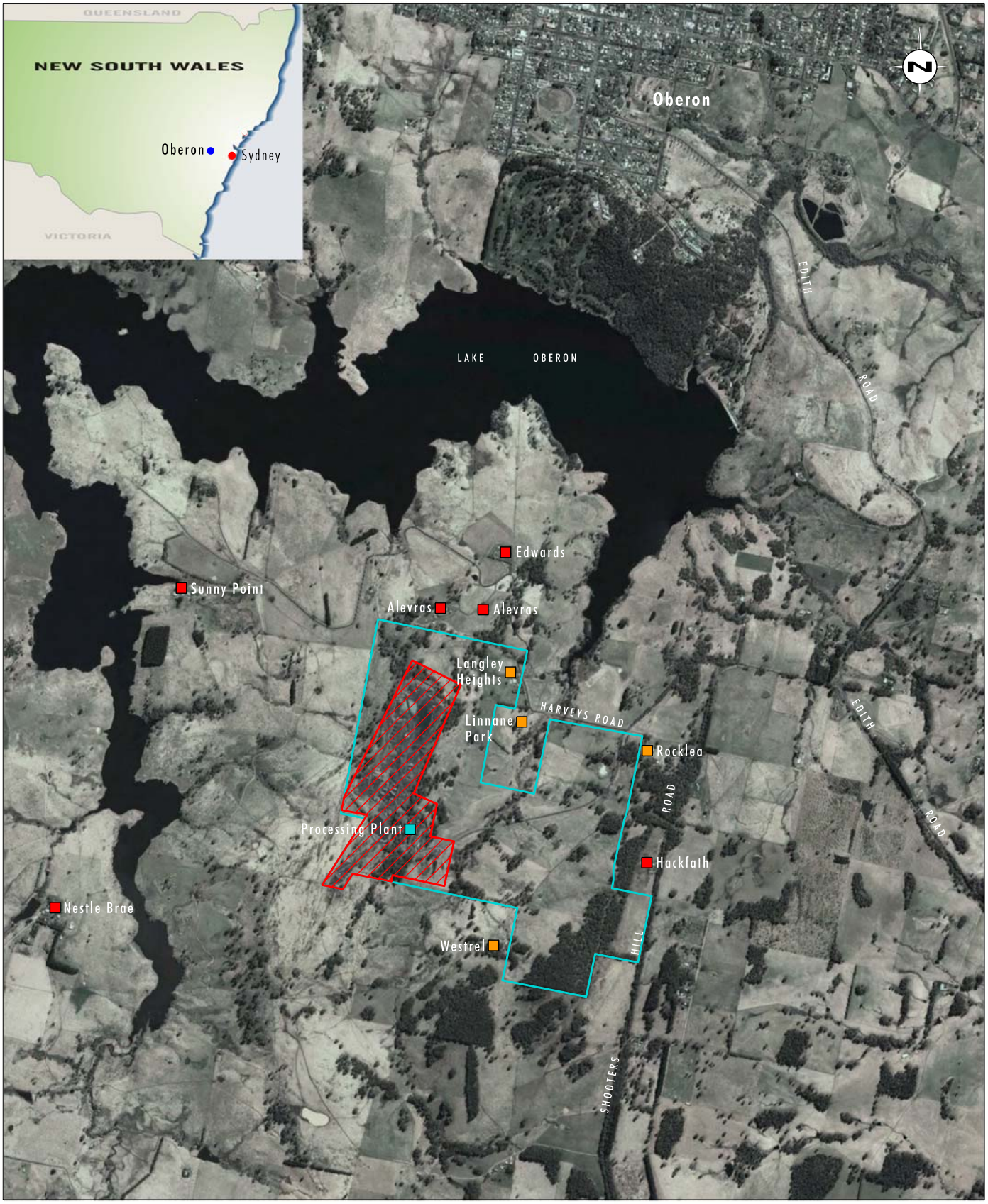
The purpose of this Blast Management Plan (BMP) is to provide a description of the measures currently implemented and those proposed to be implemented to manage blasting operations at Oberon Quarry. The requirements for this Plan have been outlined in Condition 22 of the Oberon Quarries Modification 5 Consolidated Development Consent. The scope of this document extends to the management of all blasting events undertaken by or on behalf of Oberon Quarries.

This BMP outlines the control measures to be implemented as part of the continued operations at Oberon Quarry to minimise the potential blast related impacts on the local community.

1.3 Objectives

The objectives of this BMP include:

- detail the controls currently implemented at the site and the controls to be implemented to minimise blasting impacts from the site;
- provide a blast protocol to assess monitoring results against blast impact assessment criteria to evaluate compliance;
- manage blast-related community complaints in a timely and effective manner; and
- detail the procedure for reporting blast criteria exceedances to relevant stakeholders.



Source: Google Earth (2012)

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Legend

- Project Area
- Langley Heights Property
- Private Residence
- Residence Owned by Oberon Quarries or Associated with Quarry
- Processing Plant

FIGURE 1.1

Locality Map

2.0 Regulatory Requirements

2.1 Development Consent

Oberon Quarries is required to operate in accordance with the Oberon Quarries Consolidated Consent (MOD5 – 27 September 2013). This BMP has been prepared to guide the management of blasting at the quarry and has been prepared in accordance with Condition 22 of the Direction, which states:

> '**22. Blasting**
>
> ix) by 31 December 2013, the Applicant shall commission a suitably qualified person, whose appointment has been endorsed by the Director-General, to:
> a) undertake a review of existing blast procedures and practices on site;
> b) determine whether any additional management or mitigation measures are necessary to ensure compliance with air blast overpressure and ground vibration limits in this consent; and
> c) prepare a report detailing the outcomes and recommendations of the review,
> to the satisfaction of the Director-General.
>
> Within 2 months of receiving the review report, or as otherwise agreed by the Director-General, the Applicant shall submit a copy of the report to the Director-General, with a response to any of the recommendations contained in the report, including a timetable for the implementation of any reasonable and feasible measures proposed to address the recommendations in the report. The Applicant shall then implement the measures identified by the Director-General, to the satisfaction of the Director-General.'

Management controls for potential blast impacts associated with quarrying and ancillary activities are provided in **Section 4.0**.

2.2 Blasting Criteria

Oberon Quarries undertakes blast monitoring to verify that the limits for airblast overpressure levels and ground vibration peak particle velocity are not exceeded at any point within 1 metre of any affected residential boundary or other noise sensitive area. Blast criteria arise from Condition L4 of the Oberon Quarries EPL (EPL No. 4442).

The airblast overpressure level from blasting operations must not exceed[1]:

- 115 dB (Lin Peak) for more than 5 per cent of the total number of blasts during each reporting period; and
- 120 dB (Lin Peak) at any time.

[1] For assessment of annoyance due to blasting, the EPA adopts guidelines produced by the Australian and New Zealand Environment and Conservation Council (ANZECC, 1990)

The ground vibration peak particle velocity from blasting operations must not exceed:

- 5 mm/s (millimetres per second) for more than 5 per cent of the total number of blasts carried out on the premises during each reporting period; and
- 10 mm/s at any time;
- at any point within one metre of any affected residential boundary or other noise sensitive area in the vicinity of the plant.

3.0 Blast Methods at Oberon Quarry

Explosives are used to fracture the high quality basalt to enable the extraction of the resource by earth moving equipment. To achieve this, holes are drilled in a pre determined pattern giving attention to their angle, depth and spacing. These holes are then filled with an explosive and the charge is initiated with the aid of primers and detonators. The detonation of each hole is delayed in a pre-designed sequence to ensure that each hole is fired individually in close succession. This delayed firing technique improves the efficiency of the blast and also reduces its environmental impacts.

The design of a blast depends on its location, geological structures in that area, volume of resource in the target area, end product requirements and any limiting factors in relation to potentially sensitive locations (including residences and infrastructure). Blast design is therefore completed on a blast by blast basis, ensuring that all these factors are considered to achieve blast levels within acceptable limits.

4.0 Blasting Assessment

A blasting assessment has been completed for the quarry. The information presented below provides further detail on the response to blast exceedance events during 2012.

Blasts at Oberon Quarry are monitored (i.e. overpressure and vibration) in accordance with DA 92/164. The blast monitoring results for the 2010 and 2011 calendar years shows that none of the blasts monitored were above 115 dB or 10 mm/s.

The blast monitoring results for the 2012 calendar year show that there had been two exceedances of 120 dB overpressure and no exceedances of the 5 mm/s vibration limit of the blasts that were monitored. The overpressure exceedances were due to irregularities along the blasting face, which when combined with the drill hole angle reduced the distance to face for some holes which has resulted in overpressure levels being recorded above 120 dB. Oberon Quarries is committed to ensuring that sufficient distance is maintained between the blast hole and the quarry face so that this situation does not occur in the future.

These exceedances occurred when blasting was being undertaken on the upper level at the very northern end of the extraction area approximately 360 metres from NM2 (Alevras cottage) where the blasts were monitored. In the future, blasting at the northern end of the extraction area will be at least 400 metres from Alevras cottage and will be undertaken on the lower bench which is approximately 10 metres below ground level.

Blast monitoring has been a requirement of the blasting contract for many years. There have been some problems with the implementation of component of the contract in the past and as a result of the November and December 2012 blast exceedances, Oberon Quarries has purchased its own blast monitoring equipment and has been undertaking blast monitoring in parallel with the blasting contractor to ensure that all blasts are accurately monitored.

In addition, the Quarry Manager has undertaken blasting training so that all blasts configurations and delays used can be thoroughly checked before the blasts are detonated. In conjunction with this Oberon Quarries has reduced the maximum number of holes to be detonated in a blast from 300 to 150.

Oberon Quarries has committed to ensuring that sufficient distance is maintained between the blast hole and the quarry face, that appropriate delays are used and that all blasts are monitored and recorded to avoid any further exceedances in the future.

Oberon Quarries has and will continue to manage its blasting impacts through ongoing monitoring and review of the blast design, so that the overpressure and vibration criteria are not exceeded at private residences unless agreed with the resident. With the ongoing adoption of appropriate controls and checks no adverse impacts from blasting are predicted to occur as a result of the proposed ongoing operations.

5.0 Blast Management

Oberon Quarries is committed to implementing reasonable and feasible best practice blast impact mitigation measures at the Quarry. The relevant blast controls for the operation are detailed in the sections below and will be reviewed to confirm their applicability on an ongoing basis through the process outlined in **Section 7.2.1**.

5.1 Existing Controls Utilised at Oberon Quarries

Oberon Quarries will continue to implement the following blast management measures:

- all relevant quarry personnel will be trained on the environmental obligations in relation to blasting controls;
- the surrounding landowners and Council will be notified prior to undertaking a blast;
- the date, location of blast holes and quantity of explosive used each day will be documented;
- blasts will be designed to comply with overpressure and vibration criteria;
- monitoring will be undertaken at the nearest private residence and/or other sensitive locations (as required) to verify compliance with the relevant criteria;
- the maximum number of holes to be detonated in a blast will be 150;
- sufficient distance is to be maintained between the blast hole and the quarry face;
- appropriate delays will be used;
- all blasts will be monitored and recorded;

- blast monitoring data will be used on an ongoing basis to further refine the blast design and management;

- review of blast design will be ongoing and blast management procedures will be periodically reviewed to evaluate performance and identify corrective action, if required;

- blasting will be undertaken between 9.00 am and 3.00 pm, Monday to Friday inclusive, except under apparent temperature inversions conditions when blasting shall only occur between 11.00 am and 1.00 pm Monday to Friday. No blasting is undertaken on weekends or public holidays, without approval of the Director-General.

- Oberon Quarries will undertake consultation with residents whose properties are adjacent to the development, with a view to determining the most appropriate blasting times for the development. The applicant shall, in accordance with the requirements of the council, give notice of proposed blasting times;

- not blast more than twice a week;

- design all blasts to minimise airblast overpressure and vibration using the NONEL system of equivalent;

- design all blasts based on the results of monitored blasts designed to minimise airblast overpressure and vibration using the NONEL system such that any one blast has less than a five (5) per cent probability of exceeding airblast overpressure and vibration goals as set by the EPA for affected property;

- obtain appropriate local weather observations or take indicative measurements, immediately prior to blasting and from that data shall predict whether noise levels outside the quarry area are likely to be increased above the levels expected under neutral meteorological conditions. The said observations shall be recorded by the Applicant as part of its monitoring data; and

- not blast if the predictions indicate that the EPA noise goals of 115dBL/120dBL are likely to be exceeded.

5.2 Proposed Additional Controls

Oberon Quarries will implement the following blast management practices over the life of the Oberon Quarries Project:

- detailed design will be undertaken for each blast in order to maximise the blast efficiency, minimise dust, fumes, ground vibration and airblast, the potential for flyrock and to ensure compliance with site specific blasting conditions.

- Oberon Quarries will undertake a pre-blast meteorological assessment in order to confirm the applicability of blasting during the proposed blasting times. The pre-blast meteorological assessment will inform the likelihood of potential blast impacts as a result of forecasted adverse wind inversion weather conditions;

- Oberon Quarries will monitor blasts as quarrying progresses utilising the adaptive management techniques described in **Section 7.2.1**, so that blast prediction site laws can be further refined and future blast designs can be optimised based on more detailed site information. By adopting this approach, in conjunction with the adoption of improved blasting products and methods, as they are introduced, it is anticipated that blast emissions criteria can be met without imposing any significant constraints on blast designs throughout the operation of Oberon Quarries. Oberon Quarries will design all blasts to comply with the project specific vibration and airblast criteria and to protect public and private infrastructure and property from any damage as a result of flyrock. Future updates of this plan will include any additional management requirements, taking into account the results of blast monitoring undertaken.

- the blasting site design will be constantly updated using site-specific blast monitoring data. This process will provide Oberon Quarries with flexibility to design blasts to best meet production requirements while complying with relevant criteria for residential receivers.

- In addition, and as outlined in **Section 4.2**, the Quarry Manager has undertaken blasting training so that all blasts configurations and delays used can be thoroughly checked before the blasts are detonated. In conjunction with this Oberon Quarries has reduced the maximum number of holes to be detonated in a blast from 300 to 150.

5.2.1 Blast Fume Management Protocol

Blast fume development and migration is to be observed and managed. With regard to Blast Fume Management, the following management controls will be undertaken:

- use of appropriately qualified personnel. This includes an assessment of whether the contractor is appropriately trained to undertake the drill and blast works;

- use of appropriate blast design as approved by the site drill and blast coordinator or his or her delegate;

- appropriate dewatering of drill hole prior to loading;

- minimisation of ‘sleep time’ between loading and blasting, where practical;

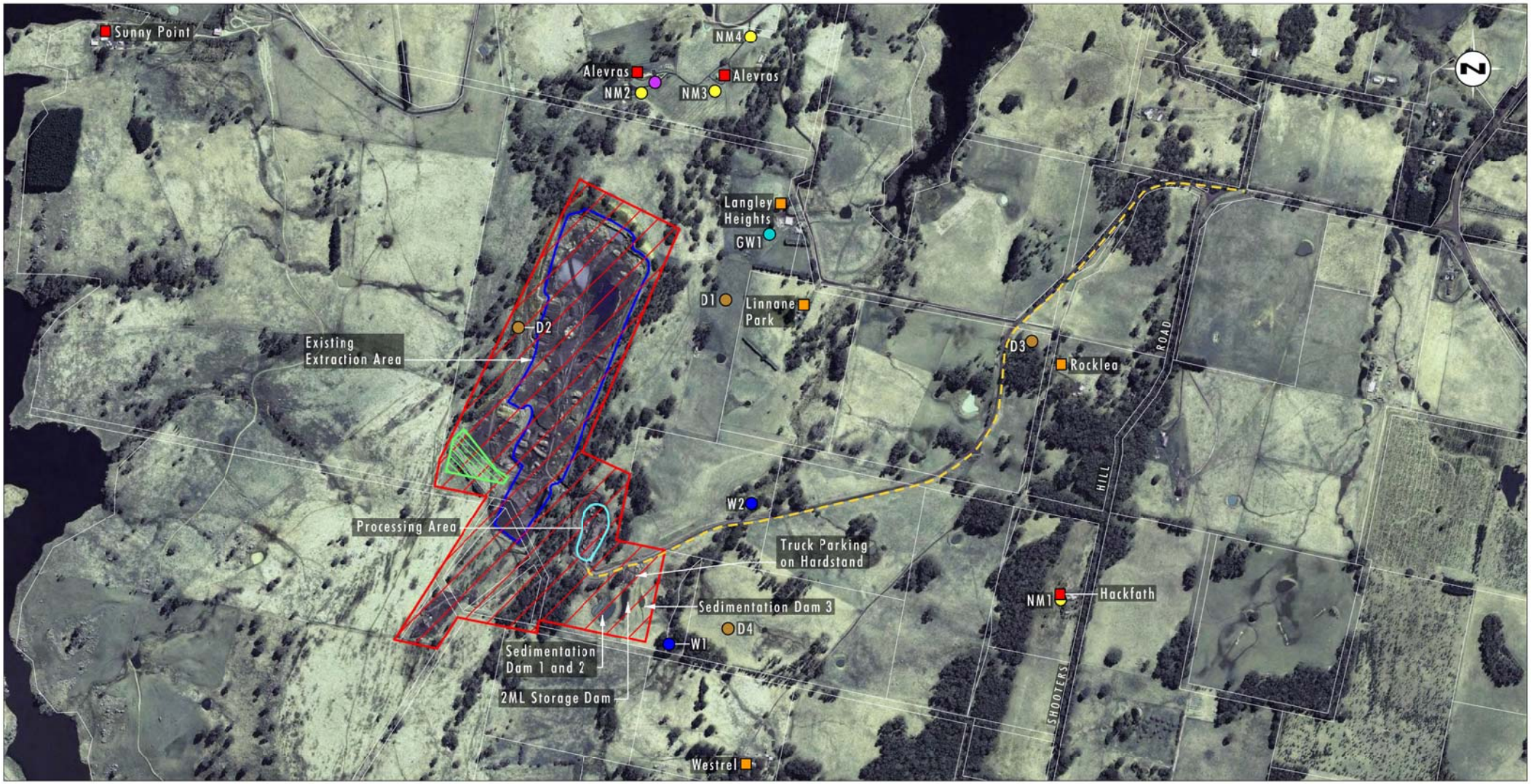
- prior to blasting, a visual weather assessment of meteorological conditions will be undertaken by the Quarry Manager to confirm that weather conditions are not conducive to fume migration; and

- In the event that blast fume generated by the blast, an investigation into the causes of the blast fume will be undertaken (refer to **Section 6.2**).

6.0 Blast Monitoring

Oberon Quarry will monitor blasts as quarrying progresses in accordance with the existing blast monitoring system so that blast performance and design can be further refined and future blast designs can be optimised based on more detailed site information.

To ensure compliance with Development Consent and EPL conditions, monitoring of blasts will be undertaken. Blast monitoring for airblast and vibration will continue to be undertaken at the locations shown in **Figure 6.1**.



Source: Google Earth (2012)

0 250 500 750m
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Legend

- Project Area
- Right of Carriageway
- Depositional Dust Gauge Location
- Surface Water Monitoring Location
- Groundwater Monitoring Location
- Noise Monitoring Location
- Blast Monitoring Location
- Private Residence
- Residence Owned by Oberon Quarries/Associated with Oberon Quarry
- Processing Plant
- Existing Extraction Area
- Proposed Extension (1.0ha)

FIGURE 6.1

Environmental Monitoring Locations

File Name (A4): R36/1296_158.dgn
20141031 16.17

6.1 Blast Data

Data collected for each blast will include:

- measured vibration;
- measured overpressure;
- maximum instantaneous charge;
- number of holes;
- blast type; and
- meteorological conditions.

6.2 Blast Fume Monitoring

Fume monitoring and post blasting investigation into fume events will be undertaken at Oberon Quarry. Fume monitoring requirements include:

- visual assessment and analysis of each blasting event to determine whether excessive fume was generated as a result of the blast. All blasts undertaken at Oberon Quarry are video recorded to provide a record of the blast;
- in the event that any blast at Oberon Quarry leads to the development of excessive fume an analysis of the blast will be undertaken to determine the cause of the blast fume development and whether the blast fume travelled off site; and
- analysis of meteorological conditions to determine the likely, if any, offsite impact of NOx fume events post blasting.

6.3 Standards Relevant to Blast Monitoring/Management

Oberon Quarries will undertake blast monitoring at Oberon Quarry in accordance with the policies, principles, regulation and guidelines contained within:

- *Protection of the Environment Operations Act 1997* (PoEO Act) administered by the OEH;
- EP&A Act administered by the Department of Planning and Environment (DP&E);
- AS 2187.2-2006 'Explosives – Storage and Use – Use of Explosives';
- *OHS Amendment (Dangerous Goods) Act 2005* and *Explosives Act 2003* administered by WorkCover;
- Prevention and Management of Blast Generated NOx Gases in Surface Blasting – Code of Good Practice (AEISG 2011); and
- *ANZECC 'Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration'.*

7.0 Reporting

7.1 External Reporting

A summary of blast monitoring results will be provided in the Oberon Quarries Annual Environmental Management Report (AEMR). The following information will be reported in the Annual Review in accordance with Condition 27 of the Development Consent.

In addition, in accordance with *Protection of the Environment Legislation Amendment Act 2011* (Amendment Act), Oberon Quarries will provide contact details on the Oberon Quarries website so residents and stakeholders can obtain proposed blast dates and times from Oberon Quarries personnel. Blast monitoring results will also be provided on the Oberon Quarries website (http://www.oberonquarries.com.au).

7.2 Blast Criteria Exceedance Reporting Protocol

Exceedances of blast criteria will be classified as environmental incidents and will be managed and reported in accordance with the requirements of EPL 4442 and the Development Consent. All environmental incidents will be investigated to a level commensurate to their risk level, by Oberon Quarries Manager in consultation with the relevant specialists, as required. Additional controls will be implemented where required, based on the outcomes of the investigation. All environmental incidents/exceedances will be reported annually in the AEMR.

Incidents that have caused, or threaten to cause material harm to the environment will be reported to the Director-General of DP&E as soon as practicable after Oberon Quarries become aware of the incident. Incidents will also be reported in accordance with EPL 4442 conditions and in accordance with the Oberon Quarry Pollution and Incident Response Management Plan (PIRMP).

Additionally, in the event an exceedance of the blast impact assessment criteria is identified, Oberon Quarries will notify DP&E and any affected landowner(s) and provide regular monitoring results to each of these parties until the results show that the operation is complying with the relevant criteria.

7.2.1 Adaptive Management

Oberon Quarries will assess and manage blast related risks to ensure compliance with the criteria outlined in **Section 2.2**.

Where a non-compliance relating blast impact has occurred, Oberon Quarries will, to the satisfaction of the Director-General of DP&E:

- take all reasonable and feasible measures to ensure the exceedance ceases and does not recur;
- consider all reasonable and feasible options for remediation (where relevant) and submit a report to the DP&E describing those options and any preferred remediation measures or other course of action; and
- implement remediation measures as directed by the Director-General of DP&E.

7.3 Complaint Response

Complaints relating to blasting at Oberon Quarry will be included on a site register and will be investigated in accordance with site practices. A summary of complaints will be available to regulatory authorities on request and provided in the AEMR.

8.0 Definitions

The terminology utilised within this BMP is defined in **Table 8.1** below.

Table 8.1 – Terminology Utilised Within the BMP

Term	Definition
Airblast/ Overpressure	An airborne shock wave resulting from detonation of explosives. An airblast may be caused by blasted material movement or the release of expanding gas into the air.
Blasting	Any activity involving the use of explosives for the purpose of producing an explosion to fragment rock for mining.
Flyrock	Rock that is propelled outside of the blasting area through the air or along the ground as a result of the detonation of explosives.
Ground vibration	The movement of the ground caused by the blast wave emanating from the blast.
Particle Velocity	A measure of ground vibration. Particle velocity describes the velocity at which a particle of ground vibrates when excited by a seismic wave.
Blast Exclusion Window	The arc of prevailing wind direction calculated on an individual blast basis and designed to minimise the risk of adverse dust or fume impacts.
Sleep time	The time taken between the drill hole being loaded with explosive and detonation of the explosive

9.0 Accountabilities

Relevant roles and responsibilities associated with this BMP are presented in **Table 9.1** below.

Table 9.1 – Roles and Responsibilities

Role	Responsibilities
Oberon Quarries Manager	• provide adequate resources for the implementation of this BMP; • authorise the implementation of specific management measures to minimise blast impacts in accordance with this plan; • ensuring that the outcomes of monitoring are systematically evaluated as part of ongoing quarry planning; • authorise internal and external reporting requirements; • oversee the implementation of the BMP; • ensure the drill pattern is drilled in accordance with the blast design; • ensure that the blast is loaded with the correct quantity and quality of explosive and stemmed in accordance with the blast design; • record drill status, including hole depths, pattern and relevant information; • coordinate blast monitoring in accordance with this BMP; • regularly review blast design parameters on the basis of blast monitoring records; • notify regulatory authorities and affected landholders of any blasting related exceedance and undertake associated reporting; manage blasting related complaints; • ensure that the results of monitoring are systematically evaluated and reported to relevant personnel for consideration as part of ongoing quarry planning; and • undertake investigations into blasting exceedances, incidents or complaints.

10.0 References

AEISG 2011. *Prevention and Management of Blast Generated NOx Gases in Surface Blasting – Code of Good Practice*.

Australian and New Zealand Environment and Conservation Council ANZECC 1990. *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration*.

EPA 2001. OEH's *'Approved methods for the sampling and analysis of air pollutants in NSW'* which refers to Australian Standard AS 2923 -1987 (Guide for measurement of horizontal wind for air quality applications).

Standards Australia, *AS 2187.2 1993 Explosives – Storage, Transport and Use.*

Standards Australia, *AS 2187.2-2006 Explosives – Storage and Use – Use of Explosives*.

APPENDIX 5

Air Quality Impact Assessment

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AIR QUALITY IMPACT ASSESSMENT

Oberon Quarry

October 2014

AIR QUALITY IMPACT ASSESSMENT

Oberon Quarry

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Prepared by
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Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

www.umwelt.com.au

Executive Summary

Oberon Quarries Pty Limited (Oberon Quarries) has been producing crushed aggregates from a high quality hard rock quarry at 'Langley Heights', approximately 4 kilometres south of Oberon since 1995. The quarry development consent is valid for a period of 20 years and is due to lapse on 1 October 2013.

Oberon Quarries proposes to extend the life of the consent of the quarry for a further 25 years which will allow for the continued extraction of the remaining high quality basalt reserves located within the approved project area and the removal of the ten year annual average production rate limitation (i.e. 200,000 tonnes ten year annual average) from the consent. The maximum annual production rate will however remain unchanged (i.e. 400,000 tonnes per annum [tpa]). It is also noted that Oberon Quarries proposes to replace some of the existing screening plant, reconfigure the alignment of screens and include an additional cone crusher. The equipment to be installed will be more energy efficient than the existing plant, will produce less fines (a by-product of the crushing process) and result in reduced environmental impacts. All other aspects of the approved quarry remain unchanged from current operations and will continue to be managed in accordance with existing site practices.

A level 2 quantitative air quality impact assessment (AQIA) has been undertaken to allow for the comparison of air quality impacts from the ongoing operation of the quarry against current air quality goals/criteria.

The AQIA demonstrates that the quarry's operation contributes to suspended particulate matter (TSP and PM_{10}) and depositional dust levels in the environment surrounding the quarry. However, the air modelling results indicate cumulative Ground Level Concentrations (GLCs) for the maximum 24 hour average PM_{10}, annual average PM_{10} and annual average TSP, and the incremental contribution to annual average deposited dust levels associated with that the ongoing operation of the quarry will not exceed NSW AQIA criteria at any of the surrounding residential locations.

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 Introduction

An environmental impact statement (EIS) was prepared in 1992 by Resource Planning Pty Limited to support the development application (DA 92/164) for the operation of Oberon Quarry. The Minister for Planning, following a Commission of Inquiry, granted development consent for the quarry subject to a range of conditions on 1 October 1993. The development consent as approved provides for the maximum annual production rate of 400,000 tonnes per annum (tpa) with a maximum daily production limit of 2000 tonnes and an average annual rate of 200,000 tonnes over any consecutive 10 year period within the 20 year life of the quarry.

Oberon Quarries Pty Limited has been producing crushed aggregates from a high quality hard rock quarry at 'Langley Heights', approximately 4 kilometres south of Oberon since 1995 (refer to **Figure 1.1**). The development consent is valid for a period of 20 years and is due to lapse on 1 October 2013.

Oberon Quarries is seeking to modify its development consent (DA 92/164). The modification is sought to extend the life of the consent for a further 20 years which will allow for the continued extraction of the remaining high quality basalt reserves located within the approved project area and the removal of the ten year annual average production rate limitation (i.e. 200,000 tpa as a ten year annual average) from the consent. The maximum annual production rate will however remain unchanged (i.e. 400,000 tpa). It is also noted that Oberon Quarries proposes to replace some of the existing screening plant, reconfigure the alignment of screens and include an additional cone crusher. The equipment to be installed will be more energy efficient than the existing plant, will produce less fines (a by-product of the crushing process) and result in reduced environmental impacts. All other aspects of the approved quarry remain unchanged from current operations and will continue to be managed in accordance with existing site practices.

The proposed modification with the exception of the replacement of crushing and screening plant and the inclusion of an additional cone crusher are administrative matters and will not result in any changes to the quarry operations or the environmental impacts which were approved under development consent (DA 92/164). Given the proposed modification to the crushing and screening plant and the changes to air impact assessment requirements since consent was granted a detailed air quality impact assessment has been undertaken.

2.0 Quarry Operation

2.1 Existing Operations

As outlined in the 1992 EIS, high quality basalt from the hard rock quarry at Langley Heights is won by drill and blast operations. The blasted rock is loaded into off-road rear dump trucks using an excavator, and is transported to the crushing plant for processing. The quarry products produced include rail ballast, aggregates, gravels, road pavement materials, pre-coat and road base. Product is stockpiled for loading into highway trucks in the processing area and quarry pit itself for subsequent transport to markets in the Oberon-Bathurst area, the Blue Mountains area, Western Sydney and other areas. Transport is via a sealed haul road to Shooters Hill Road, Edith/Jenolan Caves Road, Titania Road and other sealed roads that form part of the State road system to the market areas.

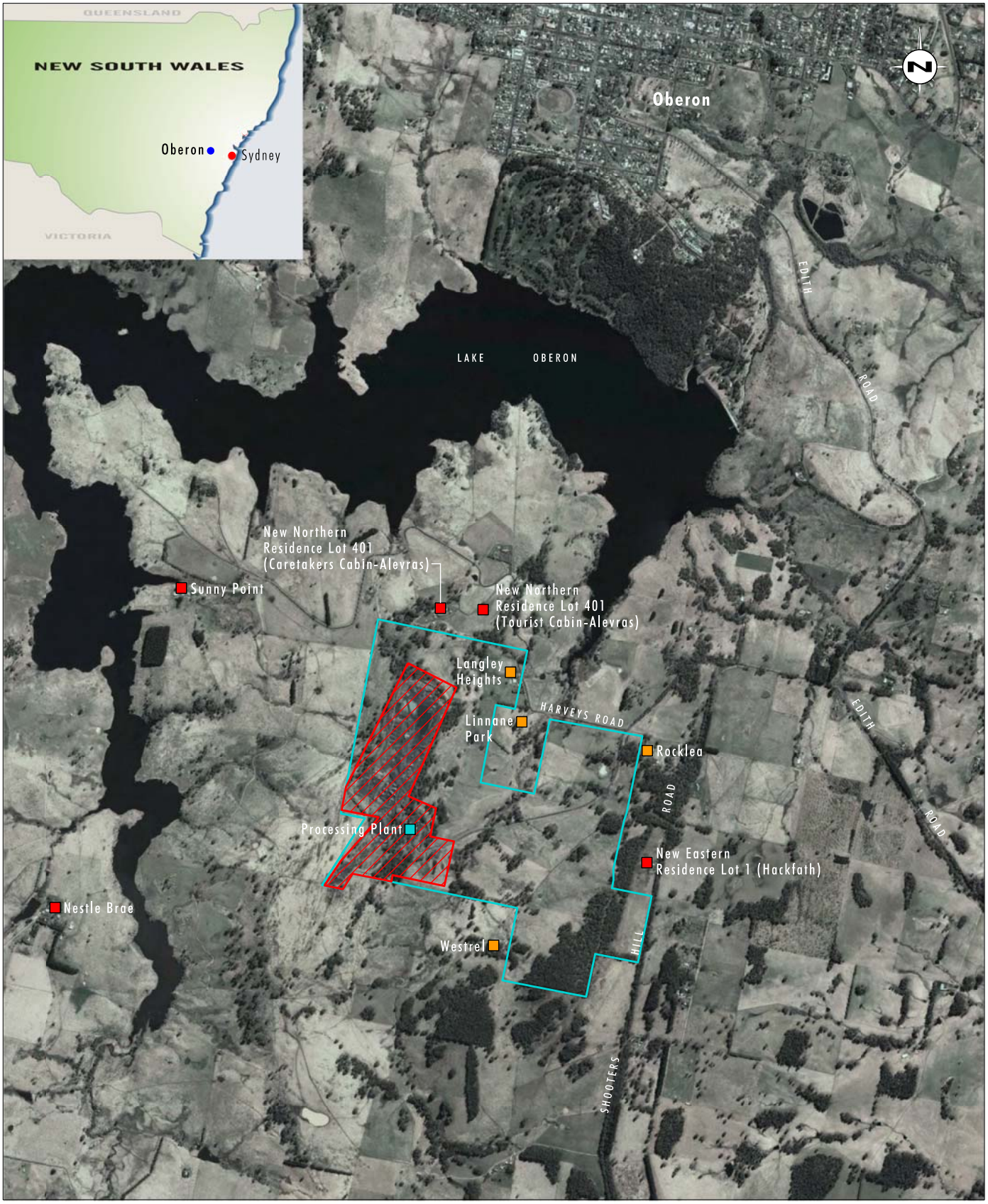

Image Source: Google Earth (2012)

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1:30 000

Legend

- Project Area
- Langley Heights Property
- Private Residence
- Residence Owned by Oberon Quarries or Associated with Quarry
- Processing Plant

FIGURE 1.1

Quarry Location

2.1.1 Extraction Area

The original approved extraction area, as defined in the 1992 EIS, is approximately 750 metres long and 250 metres wide and occupies an area of approximately 17.5 hectares. In 2004, the Minister approved a 3.5 hectare extension to the southern end of the extraction area.

Extraction is confined to the high quality basalt plateau on top of Racecourse Hill. The quarry floor is located below the skyline and is bounded on all sides by natural topography, except for a narrow cutting on the eastern hillside above the processing area, which provides haul road access to the quarry floor.

Oberon Quarries has approval to extract the high quality basalt resource from two benches each having a depth of 8 to 10 metres. Following the extraction of each bench and when sufficient room is available, sections of the quarry floor are utilised for stockpiling product and for the construction of additional primary sedimentation dams. Interburden material, which consists of clayey material between layers of basalt, fines and overburden is placed around the rim of the quarry and on the quarry floor for later incorporation into the rehabilitated landform. In the interim, interburden material has been placed around the rim of the quarry and within the first bench of the quarry extraction area.

At present, the quarry floor is approximately 8 to 10 metres below the top surface of Racecourse Hill, extraction of approximately 75% of the first bench has taken place across the extraction area. The final quarry floor will be approximately 20 metres below the top surface of the hill, when the second bench has been extracted.

Ongoing operation of the quarry will see the continued extraction of hard rock across the first bench. Extraction within the first bench will be completed prior to extracting hard rock from within the second bench. Oberon Quarries' preference is to prioritise the extraction of hard rock from the second bench in the southern extraction area. Storm events and the capture of surface water runoff may however dictate that extraction occurs elsewhere at times.

Commencing the extraction of the hard rock at the southern end of the second bench is proposed, as the amount of interburden to be stockpiled out of the quarry and/or on the quarry floor will be minimised. This will also minimise the potential double handling of interburden material used for the rehabilitation of the quarry and the creation of the final landform. Once the hard rock from the second bench in the southern area is extracted, it will be possible to place the interburden from the northern part of the quarry on the bench and floor of the southern part of the quarry, minimising the need to stockpile interburden material out of the quarry and/or on the quarry floor.

As foreshadowed in the EIS, a considerable quantity of reject material has been generated during the excavation of the first bench, due to the occurrence of overburden and the production of crusher fines. The crusher fines in the past have been stockpiled around the rim of the extraction area, within the quarry pit and on top of Racecourse Hill. The crusher fines are now however only stockpiled within the quarry extraction area.

2.1.2 Crushing and Screening/Processing Area

The processing area is located to the east of the quarry pit. The establishment of the processing area required removal of approximately 4 to 5 metres of soil and weathered rock to form a relatively level and acoustically shielded platform. Topsoil and overburden material stripped from the processing area was used to fill low sections adjacent to the processing area, to construct a hardstand area beside the quarry entrance which is used for truck

parking and refuelling activities and to create an earth acoustic bund along the eastern side of the processing area to reduce noise levels in this direction.

2.1.3 Plant Layout and Components

The quarried basalt rock is taken from the extraction area to the processing area by off road rear dump trucks. The dump trucks unload the basalt into the hopper above the primary feeder. The feeder controls the rate of supply of rock to a primary jaw crusher, which reduces the size of the larger rock pieces. Material from the primary crusher then passes over a scalping screen, which removes the clay fraction from the finer sections of the raw feed before entering the 3 inch JTY crusher. The crushed rock then continues on to a Canica crusher and passes over screens to separate and stockpile the material into the required sizes. The processed crushed rock is delivered to small product stockpiles by the discharge conveyor.

Modification of the crushing and screening plant consists of replacing the 3 inch JTY crusher with a cone crusher, replacing a deck screen and including an additional cone crusher and associated conveyor modifications. A schematic of the proposed crushing and screening plant is shown on **Figure 2.1**.

2.1.4 Product Stockpiles

As stated in **Section 2.1.3**, stockpiles of finished product accumulate under each of the discharge conveyors. There are six live stockpiles, each with a capacity of approximately 600 to 1000 tonnes.

Material is transferred from the live stockpiles to product stockpile bays located in the processing area with each of the three bays having a stockpile capacity of approximately 3000 tonnes. Excess product which cannot be stockpiled within the processing area is stored on the quarry floor.

In the past, minus 5 mm material has been stored on the southern end of Racecourse Hill and on the quarry floor. Oberon Quarries has developed markets for the minus 5 mm material (i.e. utilising the material in the production of road base material (DGB 20)) and has gradually reduced the quantity of minus 5 mm material stored on site, such that it is now only stored on the quarry floor within the extraction area.

2.1.5 Hours of Operation

The approved hours of operation at Oberon Quarries are dependent on the activity being undertaken and are detailed in **Table 2.1**.

Table 2.1 – Approved Hours of Operation

Activity	Approved Hours of Operation
Quarrying and Processing Areas	7.00 am to 6.00 pm, Mondays to Fridays 7.00 am to 5.00 pm, Saturdays No quarrying or processing shall be undertaken on Sundays or public holidays.
Loading Haul Trucks	6.00 am to 10.00 pm, Mondays to Fridays 6.00 am to 5.00 pm, Saturdays No loading of haul trucks shall be undertaken on Sundays or public holidays.

Table 2.1 – Approved Hours of Operation (cont)

Activity	Approved Hours of Operation
Product Delivery	6.00 am to 10.00 pm, Mondays to Fridays 6.00 am to 5.00 pm, Saturdays No product delivery trucks are to enter the quarry prior to 6.00 am on any day. During the periods 6.00 am to 7.00 am and 6.00 pm to 10.00 pm a maximum of 4 laden delivery trucks shall leave the site per hour (total 8 truck movements per hour).
Construction of Haul Road and Quarry Infrastructure	7.00 am to 6.00 pm Mondays to Fridays 7.00 am to 4.00 pm Saturdays No construction shall be undertaken on Sundays or public holidays.
Maintenance	7.00 am to 6.00 pm Mondays to Fridays 7.00 am to 4.00 pm Saturdays

3.0 Future Operations

The updating of the existing crushing and screening plant with modern plant which is more efficient and results in reduced environmental impacts has the potential to change the impact on emissions to air from the existing approved quarry operation.

The general layout of the quarry operations will remain essentially unchanged as will the hours of operation.

4.0 Air Quality Criteria

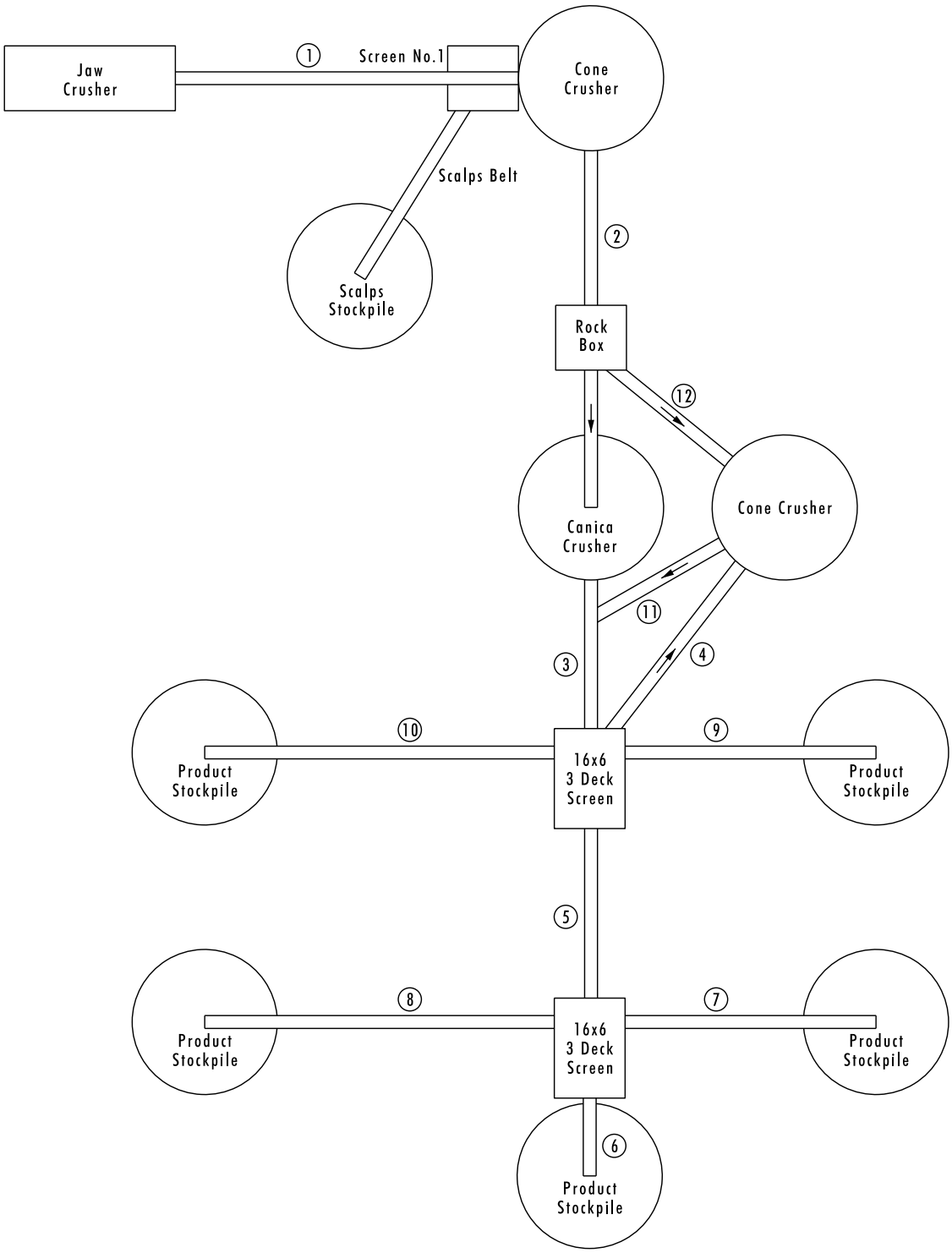
The generation and management of dust is an important aspect of minimising the air quality impacts from the Project.

Dust is a generic term describing fine particles that are suspended in the air. Naturally occurring sources of dust include dust storms, smoke from bush or grassland fires and pollen from living vegetation. Human activities, such as the burning of fossil fuel in vehicles, power plants and many industrial processes, also generate significant amounts of fine particles.

Dust particles are not individually visible to the human eye however a concentration of fine particles may be seen as a haze or smog.

Dust particles are referred to as particulate matter (PM) and are typically described by size:

- $PM_{2.5}$ includes all particles less than 2.5 µm in diameter. These particles are mainly produced from combustion processes such as vehicle exhaust.
- PM_{10} includes all particles smaller than 10 µm in diameter (smaller than 1/7th of a hair width).
- Total Suspended Particulate Matter (TSP) refers to the total of all particles suspended in the air. These particles are generally 50 µm to 100 µm in diameter (less than the average width of a human hair).



Legend

② Conveyor Belt Number

FIGURE 2.1

Processing Plant Schematic

Increased levels of $PM_{2.5}$ and PM_{10} in the air are linked to health impacts, particularly affecting people with existing health issues such as asthma, lung conditions and heart disease.

Increased levels of TSP in the air are related to amenity impacts such as visibility and dust deposition. Depositional dust is the particulate matter generated by a development that has settled out from the air.

The National Environment Protection Council (NEPC) was established by the Commonwealth Government in 1994 to provide national standards for air quality. These standards were published in the *National Environment Protection Measure (Ambient Air Quality) 1998* (NEPC, 1998). The NSW air quality targets are based on the NEPM standards.

The NSW air quality assessment criteria do not relate to the level of dust emissions from the Project alone but rather the total dust concentrations at a given location resulting from all emission sources. Therefore existing background levels need to be incorporated when assessing air quality impacts from the Project.

The *Protection of the Environment Operations (POEO) Act 1997* requires occupiers of non-residential premises to comply with any air emission standards prescribed by Protection of the Environment Operations (Clean Air) Regulation 2010. In particular, activities listed in Schedule 1 of the POEO Act 1997 are required to comply with air emissions standards prescribed within the Protection of the Environment Operations (Clean Air) Regulation 2010. These standards include limits for dust discharged during industrial, commercial and agricultural activities.

This assessment utilises the relevant (i.e. PM_{10}, TSP and depositional dust) air quality criteria specified by EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2005) (refer to **Table 4.1**).

When assessing the potential air quality impacts associated with a proposed operation, it is necessary to compare the existing air quality environment, the proposed operation and the relevant air quality criteria. Air quality criteria (refer to **Table 4.1**) are used to assess the potential for ambient air quality to give rise to adverse health or nuisance effects.

Table 4.1 – Relevant Air Quality Criteria

Pollutant	Criterion	Averaging Period	Source
PM_{10}	50 µg/m^3 *+ 30 µg/m^3	24 Hour Annual Average	OEH OEH
TSP	90 µg/m^3	Annual Average	OEH
Depositional dust	2 g/m^2/month (Maximum increase in deposited dust) 4 g/m^2/month (Maximum allowable deposited dust)	Annual Average Annual Average	OEH

* Non-cumulative for purposes of impact assessment.

\+ 5 exceedances allowed per year.

The assessment of PM_{10}, TSP and depositional dust emissions from a project against air quality criteria considers the existing levels of each substance and the contribution of the Project, i.e. the cumulative impact. The 24 hour goal for PM_{10}, relates to the Project emissions alone and does not take into account any existing background concentrations.

5.0 Existing Environment

5.1 Air Quality Environment

Air quality assessment criteria do not relate to the level of dust emissions from the Project but rather to the total dust concentration in the air at a given location. The air qaulity impact of a project must therefore be assessed cumulatively, incorporating both the air quality impacts of the Project and the existing background air quality.

5.1.1 Suspended Particulate Matter

Concentrations of PM_{10} are monitored by the NSW Environment Protection Agency (EPA) across a number of regional locations in NSW. The monitoring station in closest proximity to Oberon is in Bathurst which is approximately 40 kilometres north-west of Oberon in the NSW Central Tablelands. The dust deposition data used from Bathurst is likely to have higher PM_{10} and TSP values than the site as Bathurst has a population of 50,000 people. **Table 5.1** presents 2008 and 2012 monthly average and maximum PM_{10} values derived from the EPA Bathurst air quality monitoring station data along with estimated monthly average TSP values.

Table 5.1 – Bathurst Background Air Quality

	2008			2012		
Month	**Avg PM_{10} ($\mu g/m^3$)**	**Max 24hr Avg PM_{10}[1] ($\mu g/m^3$)**	**Estimated Avg TSP[2] ($\mu g/m^3$)**	**Avg PM_{10} ($\mu g/m^3$)**	**Max 24hr Avg PM_{10}[1] ($\mu g/m^3$)**	**Estimated Avg TSP[2] ($\mu g/m^3$)**
January	16.3	27.1	40.7	13.6	24.0	34.1
February	13.4	40.5	33.5	10.9	37.3	27.3
March	17.1	31.2	42.7	10.8	17.5	27.1
April	14.8	41.9	37.0	15.9	50.7	39.8
May	14.4	18.3	35.9	14.2	22.5	35.4
June	9.1	22.1	22.9	8.8	17.2	22.1
July	11.3	41.7	28.3	8.8	13.6	22.1
August	10.4	40.6	26.1	11.7	18.4	29.3
September	16.3	63.0	40.8	14.6	25.9	36.6
October	15.7	33.7	39.1	15.5	30.8	38.6
November	13.2	27.2	32.9	17.3	29.1	43.2
December	15.9	30.9	39.8	18.7	55.5	46.9
Annual	**14.0**	**63.0**	**35.0**	**13.4**	**55.5**	**33.5**

1. No maximum PM_{10} data available for 2008
2. Average TSP estimated from measured average PM_{10} assuming a PM_{10} to TSP ration of 0.4.

The air quality inputs of the Project were modelled with AUSPLUME using a 2008 meteorological data set, generated using The Air Pollution Model (TAPM). The 2008 values for average PM_{10}, maximum 24 hour PM_{10} and estimated TSP in **Table 5.1** are on average

higher than the corresponding 2012 data. Therefore to maintain a consistent and conservative approach the 2008 data for background air quality has been applied for the cumulative impact assessment.

5.1.2 Dust Deposition

Oberon Quarries operates a network of four depositional dust monitoring gauges as shown on **Figure 5.1**. **Table 5.2** shows the annual average dust deposition levels ranged between 1.05 g/m^2/month and 3.05 g/m^2/month at these four locations for the period between 2003 and 2012. These results show that the recorded levels have been consistently below the relevant EPA air quality criteria of 4 g/m^2/month annual average.

Table 5.2 – Annual Dust Deposition Monitoring Results (g/m^2/month)

	Dust Monitoring Location			
Year	**D1**	**D2**	**D3**	**D4**
2003	1.41	1.69	1.35	2.24
2004	1.37	1.05	1.67	2.07
2005	2.35	1.71	1.88	2.31
2006	2.82	1.97	1.67	2.72
2007	2.39	1.91	1.98	2.21
2008	2.57	1.13	1.45	2.32
2009	2.62	2.08	2.27	2.66
2010	2.90	1.65	1.71	2.71
2011	3.05	2.08	1.79	2.54
2012	2.79	2.23	1.46	1.99

EPA annual average dust depositional criteria 4 g/m^2/month

Monthly dust deposition data for 2008 is presented in **Table 5.3**. The annually averaged monthly dust deposition monitoring results for 2008 is below NSW air quality criteria for all gauges.

Table 5.3 – 2008 Dust Deposition Monitoring Results

	Dust Monitoring Location			
Month	**D1**	**D2**	**D3**	**D4**
January	5.70	2.31	2.40	2.96
February	2.17	1.57	1.67	3.80
March	0.72	0.64	0.42	0.71
April	0.87	1.05	3.35	2.63
May	3.95	1.07	1.47	0.47
June	2.00	0.73	0.68	1.71
July	2.35	0.93	0.88	2.70
August	1.22	0.84	0.70	3.96

Table 5.3 – 2008 Dust Deposition Monitoring Results (cont)

	Dust Monitoring Location			
Month	**D1**	**D2**	**D3**	**D4**
September	3.83	2.22	2.25	3.35
October	3.59	0.67	1.32	1.39
November	0.51	0.38	0.55	1.49
December	3.97	1.10	1.71	2.68
Annual Average	2.57	1.13	1.45	2.32

5.2 Meteorological Conditions

Meteorological conditions play a major role in determining how air pollutants are transported from a source location and dispersed throughout the surrounding airshed. Meteorological data such as wind direction, wind speed, temperature, atmospheric stability and mixing height will influence the direction, extent and magnitude of air quality impacts associated with an activity. These key meteorological indicators are used to describe the dispersion characteristics of a source location.

In order to describe the climatic and dispersion characteristics of the Project site, it is important to use data from a meteorological station that is representative of conditions at the project site. The AUSPLUME model used a TAPM generated meteorological data set which is reflective of the meteorological conditions experienced at the Project site during 2008. The TAPM meteorological data set was prepared by pDs Consultancy. As Oberon does not have a local monitoring station logging hourly climate conditions pDs Consultancy has prepared a synthetic meteorological data set using TAPM. **Appendix A** contains a report provided by pDs Consultancy further detailing the preparation of the meteorological data set.

5.3 Sensitive Receptors

The air quality impacts of the Project have been modelled at 11 residential receptor locations surrounding the Project (refer to **Table 5.4** and **Figure 5.1**). These locations represent the nearest sensitive receptors to the Project.

Table 5.4 – Nearest Residential Receptors

ID	Description	Easting (MGA)	Northing (MGA)	Elevation (metres)
1	Hackfath	765158	6262213	1194
2	Sunny Point	762633	6263714	1079
3	Langley Heights*	764396	6263293	1094
4	Residence North-east	766021	6264384	1141
5	Alevras_1	764005	6263656	1140
6	Alevras_2	764244	6263646	1137
7	Nestle Brae	761805	6261925	1098
8	Residence West	761015	6263361	1097
9	Residence off Oberon Quarry Road	765425	6263525	1119
10	Residence North-west	762712	6264351	1082
11	Residence North	764367	6263964	1122

Note * Oberon Quarry has a commercial agreement with this resident.

Image Source: Google Earth (2012)
Data Source: LPI (2009)

0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Dust Gauge Location
- Residential Receiver Location
- Residence Associated with Oberon Quarry

FIGURE 5.1

Dust Deposition Gauge and Receptor Locations

6.0 Air Quality Predictions

6.1 Overview

Air emissions for the Project have been modelled using AUSPLUME V6.0 dispersion modelling software.

AUSPLUME, developed in 1986 by the EPA Victoria, is a steady-state Gaussian plume dispersion model. The model is based on the assumption that cross-sections through elevated plumes from point sources of pollution have a Gaussian (or normal) distribution of concentration. The model also assumes that meteorological conditions are spatially uniform and that wind speeds vary only by height, not by direction. The AUSPLUME model is considered suitable for use in simple applications where complex terrain, coastal effects and non-uniform meteorological conditions are not significant factors.

The EPA has approved the use of AUSPLUME V6.0 for assessing the air quality impacts of existing and proposed emission sources in NSW, provided the application (or project) meets the criteria laid out in *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2005).

The use of AUSPLUME for this assessment is considered appropriate given the relatively uncomplicated terrain and spatially uniform meteorological environment of the Project site and surrounding area.

The AUSPLUME model has been used to provide air quality contours for the Project, and to assess the air quality impacts at the specific sensitive receptor locations discussed in **Section 5.3**.

Input parameters used in the modelling are discussed in **Sections 5.0** and **6.2** and include operational parameters, emissions inventory, background air quality data, meteorological data, terrain data and sensitive receptor locations.

Operational parameters are based on the Project operating at full capacity, that is, the proposed maximum production schedule.

Emission rates have been estimated using emission factors published by the US EPA (AP42) and Australian Government (NPI) as approved in *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2005).

6.2 Modelling Parameters

6.2.1 Operational Parameters

The operational parameters, presented in **Table 6.1,** are based on the Project operating at full capacity. Although the quarry operates under reduced hours on Saturdays and not at all on Sundays, air emissions have been modelled based on a seven day a week operation to provide a worst case estimate of air quality impacts.

Table 6.1 – Annual Operational Parameters

Parameter	Details
Total Production per year	400,000 tonnes
Maximum Production per day	2,000 tonnes
Number of Product Despatch Trucks per day	62.5
Operating Hours	16 hours per day, 300 days per year

6.2.2 Dust Emission Sources

Dust emissions from the quarry are generated by a range of processes including truck loading, crushing, screening and stockpiling. In the absence of site measured data, emission rates have been estimated using emission factors published by the United States EPA and the Australian Government. Where specific emission factors for either Total Suspended Particulate (TSP) or PM_{10} were unavailable it has been assumed that the PM_{10} emissions are equal to 40% of the TSP emission for a given emission source. Particulate emissions from mobile plant engine exhaust have not been included in the model, as they are not considered to be a significant generator of dust emissions. All calculated emission rates were based on a maximum production rate of 400,000 tonnes per annum for the Project. **Table 6.2** presents the instantaneous emission rates for the different quarry operations.

Table 6.2 – Quarry Emission Rates

Operation	Units	TSP	PM10	Reference
Excavator/Front End Loader Loading Haul Truck or Product Truck	g/s	0.05690	0.02691	Appendix A Section 1.1.2 – Excavators/Shovels/Front-end Loaders (on overburden) NPI Emission Estimation Technique Manual for Mining Version 3.1, 2012
Wheel Generated Dust on Haul Road[1]	g/s	0.03748	0.01147	Table 2 – Wheel Generated Dust from unpaved roads NPI Emission Estimation Technique Manual for Mining Version 3.1, 2012
Wheel Generated Dust on Product Despatch Road[1]	g/s	0.01289	0.00395	Table 2 – Wheel Generated Dust from unpaved roads NPI Emission Estimation Technique Manual for Mining Version 3.1, 2012
Haul Truck Dumping into Hopper	g/s	0.00066	0.00026	Table 11.19.2-1 Truck Unloading – Fragmented stone US EPA – AP42 Chapter 11
Primary Crushing	g/s	0.01151	0.00460	Table 21 – Primary crushing NPI Emission Estimation Technique Manual for Mining and Processing of Non-Metallic Minerals Version 2, 2000
Secondary Crushing	g/s	0.01775	0.00789	Table 11.19.2-1 Secondary Crushing US EPA – AP42 Chapter 11

Table 6.2 – Quarry Emission Rates (cont)

Operation	Units	TSP	PM10	Reference
Screening	g/s	0.41091	0.14135	Table 11.19.2-1 Screening US EPA – AP42 Chapter 11
Conveyor Transfer Point	g/s	0.04931	0.01808	Table 11.19.2-1 Conveyor Transfer Point US EPA – AP42 Chapter 11
Wind Erosion from Disturbed Areas and Stockpiles[1]	g/s/ha	0.05642	0.02257	Table 6 – Wind erosion from sand and aggregate storage piles NPI Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing, 1999

Note:

1. 75% control factor applied for level 2 watering (>2 L/m^2/h) of exposed areas (NPI, 2012)

Where different quarry operations occur in close proximity such as crushing and screening, the emission rates for these operations are aggregated and treated as a single volume source emission in the AUSPLUME model.

As the dust emissions from drilling and blasting will be infrequent and are considered to be negligible compared to the emissions expected from other quarry operations they have been excluded from this assessment of the continuous operation.

Table 6.3 contains the emission sources used in the AUSPLUME model.

Table 6.3 – Modelled Emission Sources

Source ID	Operations	Units	TSP	PM10
V1	Dump Hopper, Jaw Crusher, Conveyor Transfers	g/s	0.061473	0.022945
V2	Screening, Crushing, Conveyor Transfers	g/s	0.647600	0.235043
V3	Conveyor Transfer	g/s	0.049310	0.018080
V4	Crushing, Conveyor Transfers	g/s	0.285996	0.111769
V5	Screening, Conveyor Transfers	g/s	0.608153	0.213675
V6	Conveyor Transfer	g/s	0.049310	0.018080
V7	Conveyor Transfer	g/s	0.049310	0.018080
V8	Screening, Conveyor Transfers	g/s	0.608153	0.213675
V9	Conveyor Transfer	g/s	0.049310	0.018080
V10	Conveyor Transfer	g/s	0.049310	0.018080
V11	Conveyor Transfer	g/s	0.049310	0.018080
V12	Haul Truck Load	g/s	0.056903	0.026914
V13	Product Truck Load	g/s	0.056903	0.026914
A1a	Wind Blown Dust Pit North (a)	g/s/m^2	0.000010	0.000004
A1b	Wind Blown Dust Pit North (b)	g/s/m^2	0.000015	0.000006
A1c	Wind Blown Dust Pit North (c)	g/s/m^2	0.000008	0.000003
A2	Wind Blown Dust Pit South West of Pit	g/s/m^2	0.000006	0.000002
A3	Wind Blown Dust Pit South	g/s/m^2	0.000008	0.000003
A4	Wind Blown Dust Quarry (Plant)	g/s/m^2	0.000004	0.000001

Table 6.3 – Modelled Emission Sources (cont)

Source ID	Operations	Units	TSP	PM10
A5	Wind Blown Dust North of Pit	g/s/m^2	0.000005	0.000002
L1	Haul Road Wheel Generated Dust	g/s	0.037479	0.011473
L2	Product Despatch Road Wheel Generated Dust	g/s	0.012893	0.003947

No emission source control factors have been applied to arrive at the processing plant emission rates listed in **Table 6.2**. Line source emissions have been modelled as individual volume sources (eight for the haul road and four for the product despatch circuit) separated by less than one quarter of the distance to the nearest sensitive receptor.

Sample emission rate calculations are contained in **Appendix B**.

6.2.3 Modelled Receptors

Air emissions were estimated at 11 specific sensitive receptor locations and a number of grid locations in order to provide contour data. The sensitive receptor locations are presented in **Table 5.4** and shown on **Figure 5.1**.

6.3 Modelling Results

The modelling results for maximum 24 hour average PM_{10}, annual average PM_{10} and annual average TSP Ground Level Concentrations (GLC), and annual average deposited dust from the Project are presented in **Table 6.4**. The predicted impacts from the Project are also presented as contours on **Figures 6.1** to **6.4** for maximum 24 hour average PM_{10}, annual average PM_{10}, annual average TSP and annual average deposited dust respectively.

Predicted maximum 24 hour average PM_{10} GLCs as a result of the Project are all less than 24 µg/m^3 for all modelled receptor locations.

Modelling also indicates project contribution GLCs in both annual average PM_{10} and annual average TSP of less than 3 and 8 µg/m^3 respectively for all modelled receptor locations.

Modelling also indicates project contribution GLCs in deposited dust of 2 g/m^2/month or less for all modelled receptor locations.

Outputs from the AUSPLUME modelling are presented in **Appendix C**.

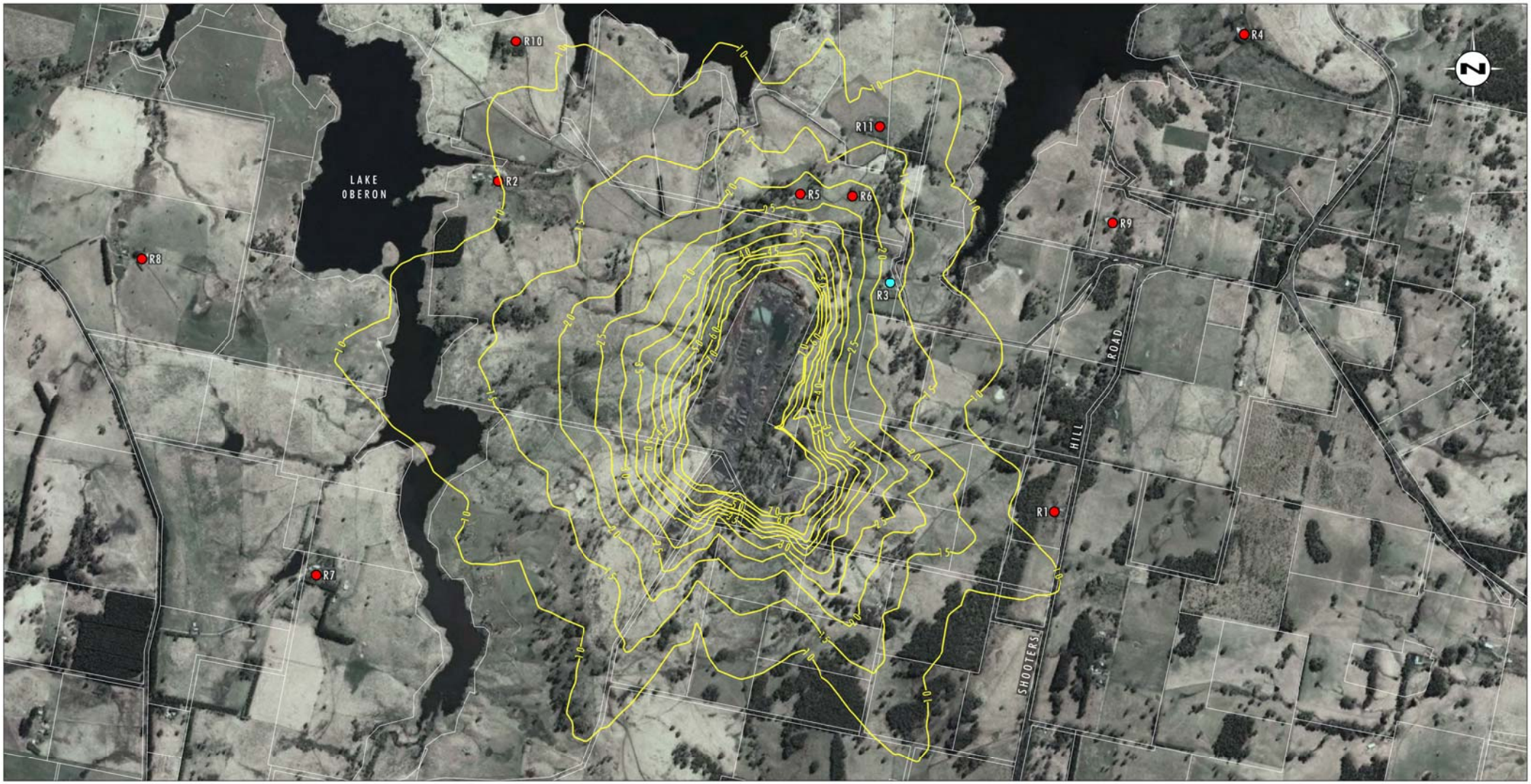


Image Source: Google Earth (2012)
Data Source: LPI (2009)

0 0.25 0.5 1.0km
1:25 000

Legend

- Predicted PM10 24 hour Average Ground Level Concentrationsdicted Contours
- Residential Receiver Location
- Residence Associated with Oberon Quarry

FIGURE 6.1

Predicted PM10 24 hour Average Ground Level Concentrations

Image Source: Google Earth (2012)
Data Source: LPI (2009)

0 0.25 0.5 1.0km
1:20 000

Legend

- Predicted PM10 Annual Average Ground Level Concentrations
- Residential Receiver Location
- Residence Associated with Oberon Quarry

FIGURE 6.2

Predicted PM10 Annual Average Ground Level Concentrations

Image Source: Google Earth (2012)

0 0.25 0.5 1.0km

1:20 000

Legend

- Predicted TSP Annual Average Ground Level Concentrations
- Residential Receiver Location
- Residence Associated with Oberon Quarry

FIGURE 6.3

Predicted TSP Annual Average Ground Level Concentrations

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20130509 14.44

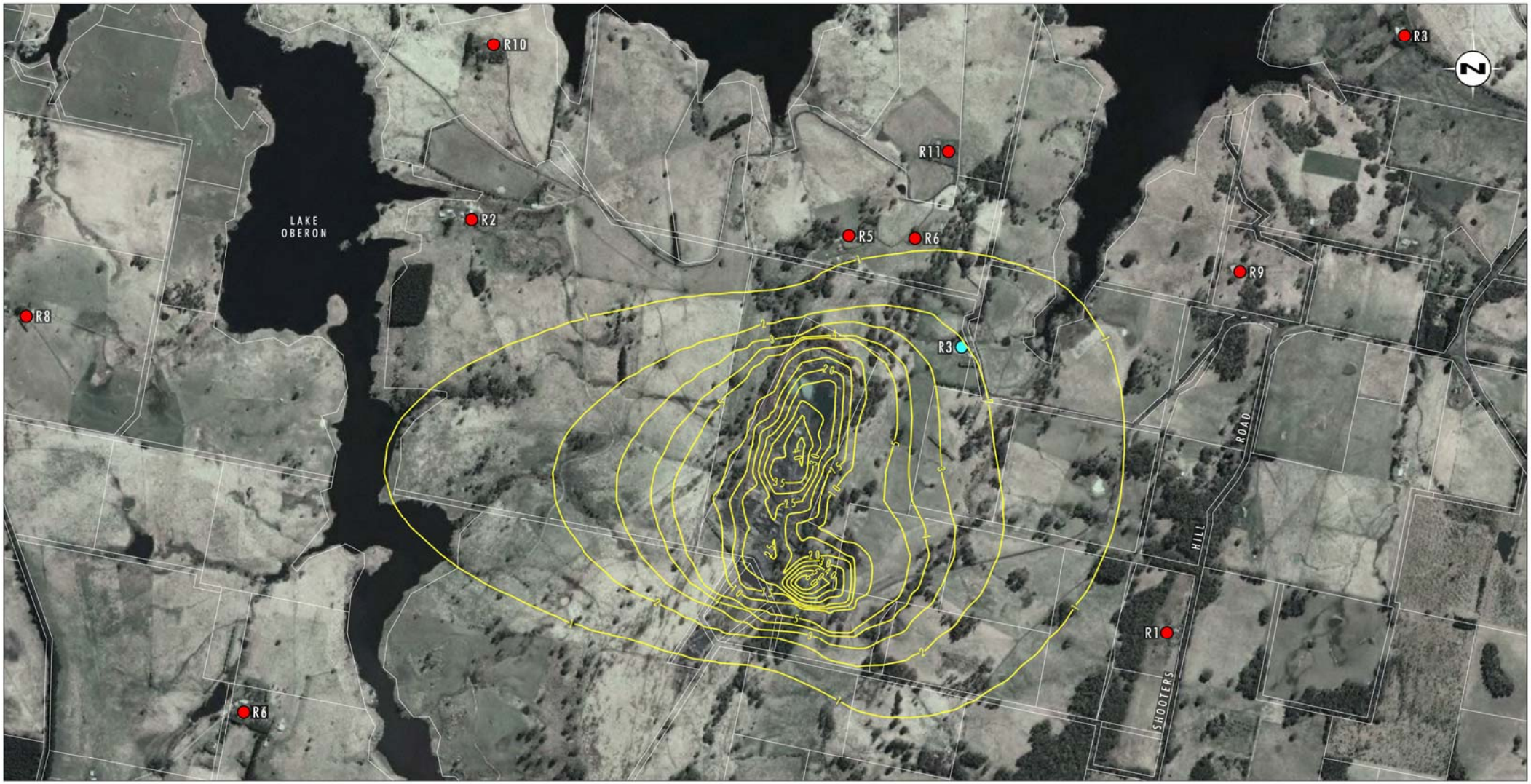


Image Source: Google Earth (2012)

0 0.25 0.5 1.0km
1:20 000

Legend

- Predicted Annual Average Monthly Dust Deposition
- Residential Receiver Location
- Residence Associated with Oberon Quarry

FIGURE 6.4

Predicted Annual Average Monthly Dust Deposition

Table 6.4 – Modelling Results for PM_{10}, TSP and Deposited Dust

ID	Description	Predicted Increment			
		Max 24 Hour Average PM_{10}	Annual Average PM_{10}	Annual Average TSP	Deposited Dust
		$\mu g/m^3$			$g/m^2/mth$
1	Hackfath	7.31	0.76	2.00	0.6
2	Sunny Point	9.74	0.76	1.95	0.4
3	Langley Heights*	18.50	2.80	7.14	2.0
4	Residence Northeast	4.06	0.38	0.99	0.3
5	Alevras_1	23.90	1.53	3.90	0.7
6	Alevras_2	22.30	1.68	4.28	0.9
7	Nestle Brae	5.70	0.47	1.25	0.3
8	Residence West	5.22	0.56	1.45	0.3
9	Residence off Oberon Quarry Road	5.02	0.71	1.85	0.6
10	Residence Northwest	7.96	0.35	0.90	0.2
11	Residence North	13.60	0.91	2.34	0.5

Note * Oberon Quarry has a commercial agreement with this resident.

7.0 Assessment of Impacts

The NSW air quality assessment criteria do not relate to the impact of dust emissions from the Project alone but rather the total dust concentration at a given location from all sources. Therefore existing background levels need to be considered when assessing air quality impacts from the Project. Air quality monitoring data collected by the EPA at the Bathurst station has been used to determine background levels for PM_{10} at each of the nominated sensitive receptors (refer to **Table 5.1**).

7.1 Cumulative Impacts

Cumulative maximum 24 hour average PM_{10}, annual average PM_{10} and annual average TSP predicted air quality dust concentrations are provided in **Tables 7.1** to **7.3** respectively.

The cumulative (i.e. including background concentrations) maximum 24 hour average PM_{10} GLCs (refer to **Table 7.1**) associated with the Project are predicted to be less than 41 $\mu g/m^3$ which is below the impact assessment criteria of 50 $\mu g/m^3$ for all modelled receptor locations. The observed background concentration quoted in **Table 7.1** corresponds with the day AUSPLUME predicts the maximum predicted increment in PM_{10}. The maximum contribution from the Project (refer to **Table 7.1**) would be 21 $\mu g/m^3$.

Table 7.1 – Maximum 24 Hour Average PM_{10} Cumulative Impact, µg/m^3

ID	Description	Maximum Predicted Increment	Observed Background	Cumulative Impact
1	Hackfath	7.31	13.40	20.71
2	Sunny Point	9.74	8.60	18.34
3	Langley Heights*	18.50	12.60	31.10
4	Residence Northeast	4.06	12.60	16.66
5	Alevras_1	23.90	9.00	32.90
6	Alevras_2	22.30	9.40	31.70
7	Nestle Brae	5.70	14.20	19.90
8	Residence West	5.22	11.90	17.12
9	Residence off Oberon Quarry Road	5.02	11.60	16.62
10	Residence Northwest	7.96	8.60	16.56
11	Residence North	13.60	9.40	23.00
Cumulative Criteria		**-**	**-**	**50**

Note * Oberon Quarry has a commercial agreement with this resident.

The cumulative annual average PM_{10} GLCs (refer to **Table 7.2**) associated with the Project are predicted to be less than 17 µg/m^3 which is below the impact assessment criteria of 30 µg/m^3, for all modelled receptor locations. The maximum predicted contribution to the annual average PM_{10} from the Project (refer to **Table 7.2**) was less than 2 µg/m^3.

Table 7.2 – Annual Average PM_{10} Cumulative Impact, µg/m^3

ID	Description	Predicted Increment	Observed [1] Background	Cumulative Impact
1	Hackfath	0.76	14.00	14.76
2	Sunny Point	0.76	14.00	14.76
3	Langley Heights	2.80	14.00	16.80
4	Residence Northeast	0.38	14.00	14.38
5	Alevras_1	1.53	14.00	15.53
6	Alevras_2	1.68	14.00	15.68
7	Nestle Brae	0.47	14.00	14.47
8	Residence West	0.56	14.00	14.56
9	Residence off Oberon Quarry Road	0.71	14.00	14.71
10	Residence Northwest	0.35	14.00	14.35
11	Residence North	0.91	14.00	14.91
Cumulative Criteria		**-**	**-**	**30**

Note 1: Annual average PM_{10} at the Bathurst station.

* Oberon Quarry has a commercial agreement with this resident.

Cumulative annual average TSP GLCs (refer to **Table 7.3**) are predicted to be less than 43 µg/m^3, which is below the impact assessment criteria of 90 µg/m^3, for all modelled receptor locations. The maximum predicted contribution to the average annual TSP from the Project (refer to **Table 7.3**) was less than 8 µg/m^3.

Table 7.3 – Annual Average TSP Emissions Cumulative Impact, µg/m^3

ID	Description	Predicted Increment	Observed [1] Background	Cumulative Impact
1	Hackfath	2.00	35.00	37.00
2	Sunny Point	1.95	35.00	36.95
3	Langley Heights	7.14	35.00	42.14
4	Residence North-east	0.99	35.00	35.99
5	Alevras_1	3.90	35.00	38.90
6	Alevras_2	4.28	35.00	39.28
7	Nestle Brae	1.25	35.00	36.25
8	Residence West	1.45	35.00	36.45
9	Residence off Oberon Quarry Road	1.85	35.00	36.85
10	Residence North-west	0.90	35.00	35.90
11	Residence North	2.34	35.00	37.34
Cumulative Criteria		**-**	**-**	**90**

Note 1: Annual average estimated TSP based on Bathurst station PM10 and a PM10 to TSP ratio of 0.4.

* Oberon Quarry has a commercial agreement with this resident.

Incremental dust deposition rates as a result of the Project are predicted to be at or below the impact assessment criteria of 2 g/m^2/month for all modelled receptors. While there is no available background dust deposition data that could be used for a cumulative assessment, Oberon Quarries has four dust deposition gauges located around the quarry (refer to **Figure 5.1** and **Table 5.2**) that effectively measure the cumulative impact of the quarry's dust emissions and the background air quality dust deposition rates. Dust deposition monitoring results from 2003 to 2012 show that the annual average cumulative dust deposition rates in the vicinity of the quarry are below the impact assessment criteria of 4 g/m^2/month.

8.0 Conclusion and Recommendations

8.1.1 Conclusion

The ongoing operation of the quarry will contribute to the PM_{10}, TSP and depositional dust concentrations in the area surrounding the Project site. Air quality modelling however, indicates that the cumulative impact of the Project (i.e. the Project plus background) for PM_{10}, TSP and depositional dust do not exceed NSW AQIA criteria at any of the surrounding residential locations. It is therefore considered that the ongoing operation of the quarry can be undertaken without causing significant air quality impacts on the surrounding residential locations.

8.1.2 Recommended Management and Monitoring Program

Oberon Quarries will implement the following dust mitigation and management measures:

- continue dust depositional monitoring at the four existing locations;
- implementing water sprays at the point where conveyors discharge to the product stockpiles; and
- maintaining haul road and exposed surfaces in a damp state.

The results of the monitoring program should be reviewed by Oberon Quarries' management to assess compliance with the goals outlined in **Section 4.0** and reported in accordance with any requirements of the development consent or EPL.

Should compliance not be achieved, Oberon Quarries should identify and implement any feasible and reasonable dust mitigation measures.

9.0 References

DEC, 2005. EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.*

NEPC, 1998. *National Environment Protection Measure (Ambient Air Quality) 1998.*

APPENDIX A

pDs Consultancy Meteorological
Data Set Report

Site-Specific Input Meteorological data file for AUSPLUME

Oberon-2008

This file was exclusively compiled for **Umwelt (Australia)** Pty Ltd By pDs Consultancy Service.

pDs Consultancy
@1999-2013

TABLE OF CONTENTS

Introduction

Gaussian plume models such as AUSPLUME/AERMOD require hourly averaged meteorological data from a single site that is preferably within the model domain ('on-site' or site-specific data). However, data from the nearest 'off-site' meteorological station can be used when no on-site data are available, and the off-site data are representative of the area of concern (i.e. the meteorological parameters characterise the transport and dispersion conditions of the location in question).

It is also preferable that:

- The compilation of the input meteorological data file is done in accordance with 'best practice', with procedures and algorithms recommended or set by environment regulators.
- The instrumentation collecting mandatory data such as wind speed, direction, sigma-theta (calculated from wind direction measurements) and ambient temperature, meet Australian Standards AS2923 (ambient air guide for measurement of horizontal wind for air quality applications).

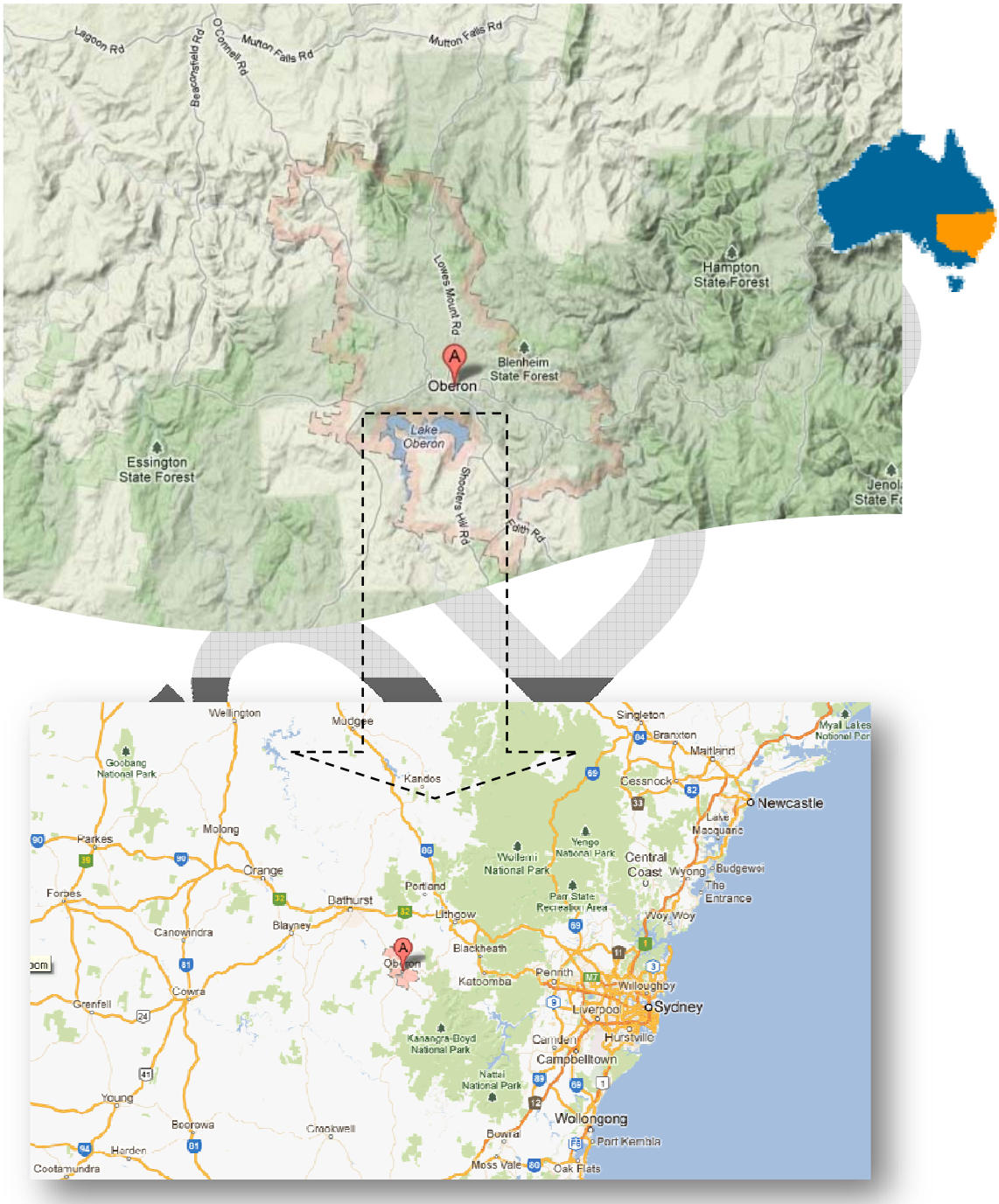
pDs Consultancy has been engaged by **UMWELT(Australia) Pty Ltd** to compile an 'AUSPLUME-type' site-specific meteorological file for a site at **Oberon** in New South Wales.

Since there were no representing weather stations nearby to the modelling area of concern, a mandatory data and other secondary parameters were generated running TAPM V4 in order to prepare site-specific meteorological data file for the modelling domain.

Vertical Temperature and Moisture Profiles from Sydney Airport (maintained by Australian Bureau of Meteorology) were used to determine convective mixing height.

This input meteorological data file has been compiled following the EPA, Victoria guideline: "Construction of meteorological data files for AUSPLUME (Publication No.1459)".

LOCATION: OBERON, NSW



DATA PROCESSING

Input Information

Data Source

1. TAPM –generated parameters
    i. 10m Wind Direction and Speed
    ii. Ambient Temperature (Screen Level)
    iii. Total Solar Radiation
    iv. Net Radiation
    v. Precipitation Rate

These four parameters are generated at the point of interest using the output of a TAPM run for the year 2008.

2. Sydney Airport Vertical temperature and Moisture Profiles –National Climate Centre– Bureau of Meteorology, Melbourne.
    - Vertical temperature profiles; Temperature, Dew point, Pressure level, Geopotential Height (1 profile per day)

QA/QC ON RAW DATA

This data set was generated running TAPM in the following manner

- in 5 nested grids, inner most grid with .3 KM resolution.
- with high resolution topography (9 second DEM).
- Verifying vegetation and soil type match with interested area.

- All meteorological parameters checked against their upper and lower ranges of validity.

SYDNEY AIRPORT (BOM)VERTICAL TEMPERATURE PROFILES

- Gaps in vertical temperature profiles were filled with previous or following day data for the completeness.

VERTICAL STABILITY

Solar Radiation for day time and Net Radiation for night-time were used to determine stability classes.

TABLE 1: STABILITY CLASSIFICATION FOR DAYTIME USING SOLAR RADIATION AND WIND SPEED

	Solar Radiation (W/m²)			
Wind Speed(m/s)	≥925	≥675	≥175	< 175
< 2	A	A	B	D
< 3	A	B	C	D
< 5	B	B	C	D
< 6	C	C	D	D
≥ 6	C	D	D	D

TABLE 2: STABILITY CLASSIFICATION FOR NIGHT-TIME USING NET RADIATION AND WIND SPEED

	Net Radiation (W/m²)			
Wind Speed(m/s)	≥-14	≥-28	≥-56	All other
< 2	D	F	F	F
< 3	D	E	F	F
< 5	D	D	E	E
< 6	D	D	D	D
≥ 6	D	D	D	D

Mixing height (Convective & Mechanical)

DEFINITION:

The mixing height, the depth of the surface mixed layer is the height of the atmosphere above the ground, which is well mixed due either to mechanical turbulence or convective turbulence. The air layer above this height is stable.

The mixing height was determined by using the methodology of Benkley and Schulman (Journal of Applied Meteorology, Volume 18, 1979,pp 772-780). **Sydney** upper air observation containing temperature and moisture profiles were used to determine daytime mixing height.

Surface wind speeds and roughness are used to calculate the depth of the mechanically forced boundary layer during both night and day time.

MixHm=0.185* Ustar/Cterm

Where Ustar=.35*Usfc/Ln (Htanemo/Z0)

Cterm = Coriolis Term =2 Ω Sin(ϕ)

Where Ω is the angular velocity of the earth

ϕ is the latitude

Htanemo= Anemometer Height, Z0 is the roughness

Height of the convective boundary layer was determined using daytime temperature sounding (Vertical temperature and dewpoint profiles), hourly surface temperature and dew point in between sunrise and sunset. Note that

the daytime mixing height has been selected as the larger of the convective and mechanical boundary layer heights

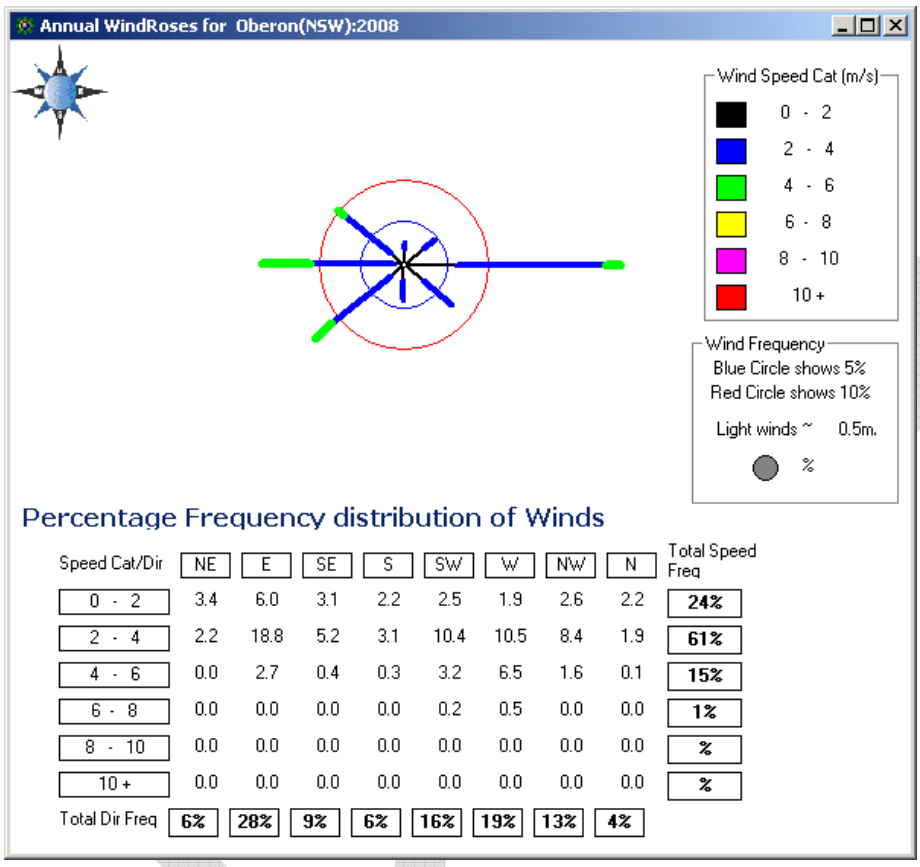
ANALYSIS

DATA COVERAGE

Season	No. of Days	Percentage
Summer (91 days)	91	100%
Autumn (92 days)	92	100%
Winter(92 days)	92	100%
Spring (91 days)	91	100%
Annual (366 days)	366	100%

www.pdsconsultancy.com.au metfile@pdsconsultancy.com

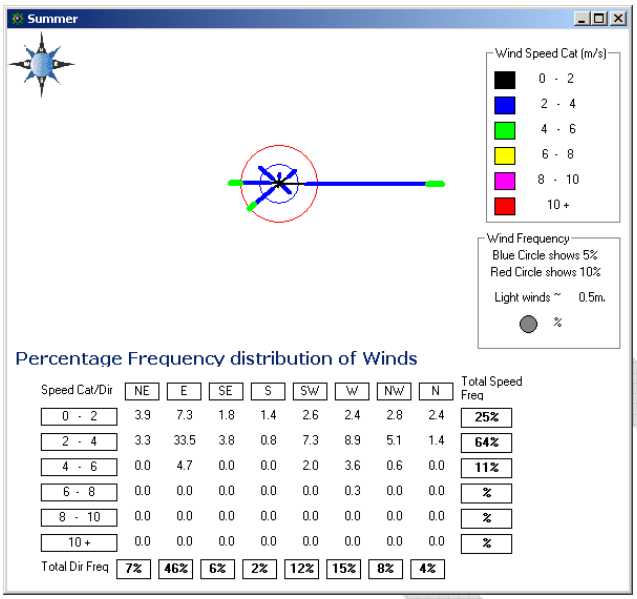
ANNUAL WINDROSES FOR OBERON



Percentage Frequency distribution of Winds

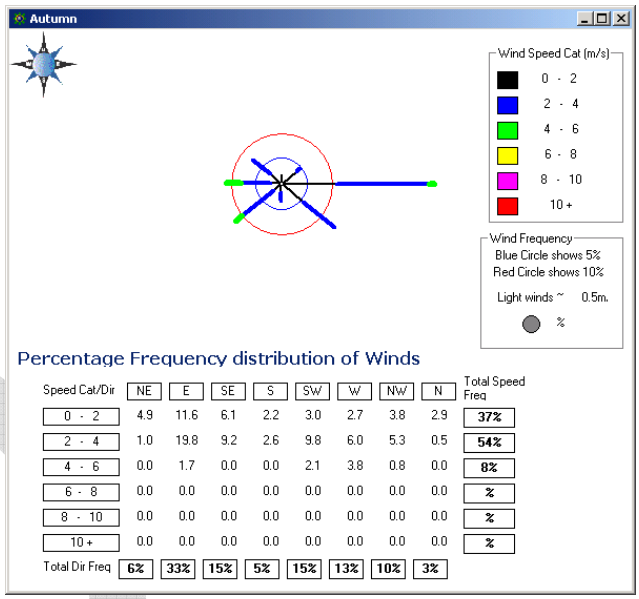
Speed Cat/Dir	NE	E	SE	S	SW	W	NW	N	Total Speed Freq
0 - 2	3.4	6.0	3.1	2.2	2.5	1.9	2.6	2.2	24%
2 - 4	2.2	18.8	5.2	3.1	10.4	10.5	8.4	1.9	61%
4 - 6	0.0	2.7	0.4	0.3	3.2	6.5	1.6	0.1	15%
6 - 8	0.0	0.0	0.0	0.0	0.2	0.5	0.0	0.0	1%
8 - 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
10 +	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
Total Dir Freq	6%	28%	9%	6%	16%	19%	13%	4%	

SEASONAL WINDROSES



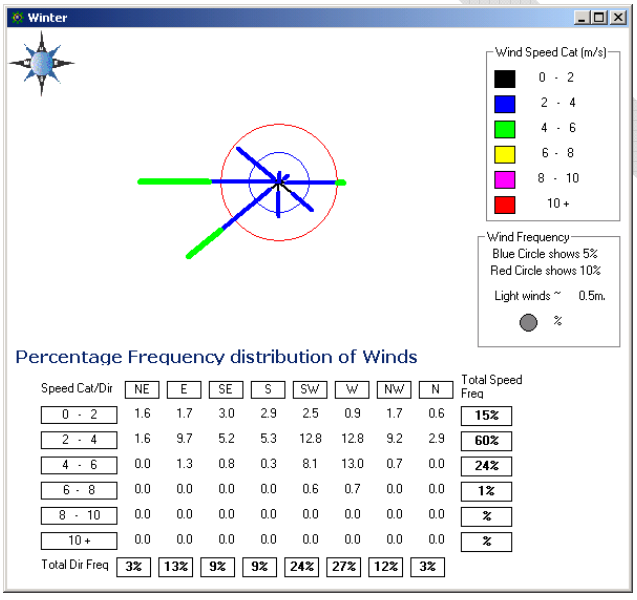
Percentage Frequency distribution of Winds

Speed Cat/Dir	NE	E	SE	S	SW	W	NW	N	Total Speed Freq
0 - 2	3.9	7.3	1.8	1.4	2.6	2.4	2.8	2.4	25%
2 - 4	3.3	33.5	3.8	0.8	7.3	8.9	5.1	1.4	64%
4 - 6	0.0	4.7	0.0	0.0	2.0	3.6	0.6	0.0	11%
6 - 8	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	%
8 - 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
10 +	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
Total Dir Freq	7%	46%	6%	2%	12%	15%	8%	4%	



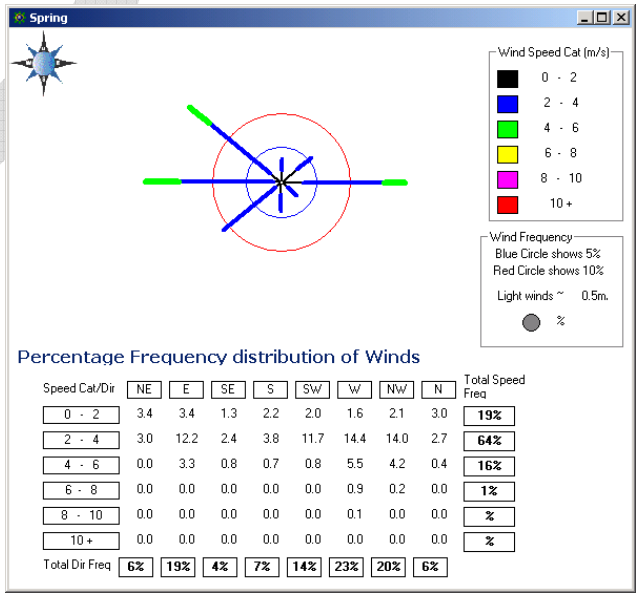
Percentage Frequency distribution of Winds

Speed Cat/Dir	NE	E	SE	S	SW	W	NW	N	Total Speed Freq
0 - 2	4.9	11.6	6.1	2.2	3.0	2.7	3.8	2.9	37%
2 - 4	1.0	19.8	9.2	2.6	9.8	6.0	5.3	0.5	54%
4 - 6	0.0	1.7	0.0	0.0	2.1	3.8	0.8	0.0	8%
6 - 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
8 - 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
10 +	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
Total Dir Freq	6%	33%	15%	5%	15%	13%	10%	3%	



Percentage Frequency distribution of Winds

Speed Cat/Dir	NE	E	SE	S	SW	W	NW	N	Total Speed Freq
0 - 2	1.6	1.7	3.0	2.9	2.5	0.9	1.7	0.6	15%
2 - 4	1.6	9.7	5.2	5.3	12.8	12.8	9.2	2.9	60%
4 - 6	0.0	1.3	0.8	0.3	8.1	13.0	0.7	0.0	24%
6 - 8	0.0	0.0	0.0	0.0	0.6	0.7	0.0	0.0	1%
8 - 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
10 +	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
Total Dir Freq	3%	13%	9%	9%	24%	27%	12%	3%	



Percentage Frequency distribution of Winds

Speed Cat/Dir	NE	E	SE	S	SW	W	NW	N	Total Speed Freq
0 - 2	3.4	3.4	1.3	2.2	2.0	1.6	2.1	3.0	19%
2 - 4	3.0	12.2	2.4	3.8	11.7	14.4	14.0	2.7	64%
4 - 6	0.0	3.3	0.8	0.7	0.8	5.5	4.2	0.4	16%
6 - 8	0.0	0.0	0.0	0.0	0.0	0.9	0.2	0.0	1%
8 - 10	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	%
10 +	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	%
Total Dir Freq	6%	19%	4%	7%	14%	23%	20%	6%	

Seasonal variations are clearly depicted.

ANNUAL STABILITY DISTRIBUTION

Stability Category	% Distribution	Avg Wind Speed	Avg Temperature	Avg Mixing Height
A	5	2.1	17.2	699
B	19	3.1	15.2	883
C	15	3.5	13.9	847
D	28	3.2	10.1	738
E	10	3.3	9.9	754
F	24	2.1	8.4	482

STATISTICS OF OBERON INPUT METEOROLOGICAL DATA FILE-2008

Stability Class	STATs	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
A	Max of Temp	26.0	22.0	24.0	19.0	15.0			10.0	19.0	26.0	25.0	24.0	26.0
	Min of Temp	14.0	12.0	11.0	14.0	11.0			6.0	8.0	12.0	12.0	14.0	6.0
	Average of Temp	22.2	17.6	19.2	16.4	13.4			9.0	12.6	18.1	18.6	19.8	18.6
	Max of WS	2.9	2.9	2.9	1.9	1.9			1.9	2.9	2.9	2.9	2.9	2.9
	Min of WS	0.4	0.5	0.6	0.9	0.9			1.5	1.5	0.9	0.3	0.5	0.3
	Average of WS	1.8	2.2	1.9	1.4	1.3			1.7	2.3	2.2	1.9	2.0	1.9
	Max of MixH	1266	1296	1075	434	434			439	968	1384	2217	1499	2217
	Min of MixH	205	126	160	222	222			342	348	262	280	165	126
	Average of MixH	532	514	471	324	303			390	579	624	814	598	546
B	Max of Temp	28.0	23.0	24.0	19.0	15.0	13.0	9.0	13.0	20.0	26.0	28.0	25.0	28.0
	Min of Temp	11.0	11.0	8.0	6.0	5.0	5.0	2.0	2.0	4.0	4.0	7.0	9.0	2.0
	Average of Temp	19.7	16.3	16.3	12.3	11.0	10.4	6.2	7.6	12.5	16.0	16.8	18.4	15.3
	Max of WS	4.9	4.7	4.8	4.8	3.9	1.8	4.4	4.8	4.9	4.9	4.8	4.9	4.9
	Min of WS	0.8	0.4	0.3	0.5	0.4	0.3	1.4	1.2	0.8	0.7	0.7	0.9	0.3
	Average of WS	2.6	2.5	2.3	2.6	1.5	1.4	2.7	2.7	3.1	3.0	3.3	3.4	2.7
	Max of MixH	1426	2455	1157	1089	884	416	981	1089	1891	1570	2432	1489	2455
	Min of MixH	200	126	120	200	143	160	325	285	257	200	188	200	120
	Average of MixH	655	630	550	586	345	318	616	609	856	754	1025	781	696
C	Max of Temp	26.0	23.0	22.0	20.0	14.0	11.0	13.0	14.0	19.0	26.0	27.0	23.0	27.0
	Min of Temp	9.0	7.0	7.0	2.0	3.0	0.0	-1.0	-1.0	4.0	1.0	3.0	7.0	-1.0
	Average of Temp	15.0	14.9	14.4	11.0	9.4	7.6	5.8	4.6	9.6	16.8	14.2	15.4	11.3
	Max of WS	5.0	4.4	5.4	5.9	4.5	4.9	4.5	5.0	5.7	6.6	5.1	5.8	6.6
	Min of WS	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	Average of WS	3.3	2.8	3.0	3.0	3.0	3.5	3.0	3.3	3.4	3.7	3.3	3.2	3.2
	Max of MixH	1337	2368	1308	1340	1015	2612	1027	1135	1992	1489	1961	1443	2612
	Min of MixH	451	445	439	462	462	456	451	439	462	451	456	445	439
	Average of MixH	795	700	701	683	689	841	686	754	856	869	814	766	767
D	Max of Temp	24.0	21.0	23.0	20.0	14.0	12.0	12.0	13.0	17.0	25.0	25.0	22.0	25.0
	Min of Temp	8.0	5.0	4.0	0.0	1.0	-1.0	-3.0	-2.0	-1.0	-2.0	1.0	4.0	-3.0
	Average of Temp	14.1	12.6	12.4	7.8	7.0	6.3	3.5	2.4	7.2	12.5	11.2	12.8	8.2
	Max of WS	5.4	4.4	5.1	5.6	5.3	5.9	7.0	6.4	6.3	6.3	8.2	6.1	8.2
	Min of WS	1.0	0.7	0.5	1.0	0.2	1.0	0.7	0.9	1.0	0.4	0.5	0.4	0.2
	Average of WS	3.2	2.5	2.5	3.1	2.6	3.5	3.7	3.7	3.7	2.8	3.0	3.1	3.2
	Max of MixH	1232	1117	1152	1272	1209	1346	1591	1449	1409	1432	1842	1386	1842
	Min of MixH	234	154	165	217	143	211	200	205	251	200	196	160	143
	Average of MixH	726	576	573	696	585	809	847	837	843	646	706	712	733
E	Max of Temp	19.0	20.0	17.0	16.0	10.0	8.0	7.0	5.0	15.0	22.0	18.0	15.0	22.0
	Min of Temp	9.0	6.0	5.0	1.0	1.0	-1.0	-2.0	-1.0	5.0	0.0	6.0	5.0	-2.0
	Average of	13.8	12.5	8.8	8.2	5.1	4.2	2.3	2.0	9.1	11.6	8.9	10.2	7.6

	Temp													
	Max of WS	3.9	4.8	4.4	4.3	4.6	4.9	4.8	4.8	4.8	4.7	3.9	4.4	4.9
	Min of WS	2.3	2.0	2.0	2.1	2.0	2.4	2.0	2.0	2.1	2.1	2.0	2.0	2.0
	Average of WS	3.1	3.3	3.1	3.1	3.5	3.5	3.4	3.4	3.5	3.2	3.2	3.4	3.4
	Max of MixH	884	1095	1004	970	1038	1135	1107	1089	1095	1072	890	1015	1135
	Min of MixH	519	462	456	485	456	548	456	445	485	473	456	456	445
	Average of MixH	701	741	709	718	806	804	785	773	801	740	734	769	764
F	Max of Temp	20.0	16.0	20.0	13.0	11.0	9.0	9.0	10.0	15.0	20.0	18.0	19.0	20.0
	Min of Temp	8.0	5.0	4.0	-2.0	0.0	0.0	-2.0	-2.0	-2.0	-4.0	5.0	5.0	-4.0
	Average of Temp	15.3	12.3	12.2	7.5	6.3	5.2	3.0	2.2	5.4	9.8	11.0	12.5	8.7
	Max of WS	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	Min of WS	1.2	0.9	0.6	0.6	0.4	0.8	0.0	1.0	0.4	0.5	1.2	0.4	0.0
	Average of WS	1.9	2.0	1.9	1.9	1.7	2.0	2.1	2.1	2.1	2.0	2.3	2.2	2.0
	Max of MixH	662	667	667	673	673	673	667	673	707	679	673	667	707
	Min of MixH	274	205	200	160	131	200	114	228	143	177	280	194	114
	Average of MixH	442	451	427	432	391	455	486	472	484	457	516	499	455

DISCLAIMER

Compilation of input meteorological data file for AUSPLUME was done under the supervision of qualified and experienced meteorologists. Although all due care has been taken, we cannot give any warranty, nor accept any liability (except that required by law) in relation to the information given, its completeness or its applicability to a particular problem. These data and other material are supplied on the condition that you agree to indemnify us and hold us harmless from and against all liability, losses, claims, proceedings, damages, costs and expenses, directly or indirectly relating to, or arising from the use of or reliance on the data and material which we have supplied.

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APPENDIX B

Emission Rate Sample Calculation

Appendix B – Sample Emission Rate Calculations

Truck Loading with Excavator or Front End Loader

The following equation was used to estimate the emission factors for PM10 and TSP for the truck loading operation.

$$E = k \times 0.0016 \times \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Where

E = Emission factor

k = 0.74 for TSP and 0.35 for PM10

U = Average wind speed [m/s]

M = Moisture content of material being handled [%] (where 0.25<M<4.8)

Reference: *NPI Emission Estimation Technique Manual for Mining Version 3.1*, 2012Appendix A Section 1.1.2 - Excavators/Shovels/Front-end Loaders (on overburden)

For U = 2.8 m/s (average site wind speed from meteorological data file) and M = 1.5% (assumed) the PM emission factor is:

$$E_{PM10} = 0.35 \times 0.0016 \times \frac{\left(\frac{2.8}{2.2}\right)^{1.3}}{\left(\frac{1.5}{2}\right)^{1.4}}$$

$$E_{PM10} = 0.001146 \frac{kg}{T}$$

At a production rate of 400,000 T per annum, 52 weeks per year operation and operating hours of 16 hours per weekday and 11 hours per Saturday the PM10 emission rate is:

$$m_{PM10} = \frac{0.001146 \frac{kg}{T} \times 400{,}000 \frac{T}{year} \times 1000 \frac{g}{kg}}{52 \frac{week}{year} \times \left(5 \frac{day}{week} \times 16 \frac{h}{day} + 1 \frac{day}{week} \times 11 \frac{h}{day}\right) \times 3600 \frac{s}{h}}$$

$$m_{PM10} = 0.02691 \frac{g}{s}$$

Wheel Generated Dust on Unpaved Roads

The following equations were used to estimate the emission factors for PM10 and TSP for the wheel generated dust from haul trucks and product trucks.

$$E_{TSP} = \frac{0.4536}{1.6093} \times 4.9 \times \left(\frac{s}{12}\right)^{0.7} \times \left(\frac{W \times 1.1023}{3}\right)^{0.45}$$

$$E_{PM10} = \frac{0.4536}{1.6093} \times 1.5 \times \left(\frac{s}{12}\right)^{0.9} \times \left(\frac{W \times 1.1023}{3}\right)^{0.45}$$

Where

E = Emission factor [kg/VKT] (VKT – vehicle kilometre travelled)

s = Silt content of road [%]

W = Gross vehicle mass [T]

For s = 8.3% (*AP-42 Table 13.2.2-1*, Stone quarrying and processing Haul Road to/from pit) and a gross vehicle weight of 68 T (fully laden CAT 769C) the TSP emission factor is:

$$E_{TSP} = \frac{0.4536}{1.6093} \times 4.9 \times \left(\frac{8.3\%}{12}\right)^{0.7} \times \left(\frac{68 \times 1.1023}{3}\right)^{0.45}$$

$$E_{TSP} = 0.1808 \frac{kg}{VKT}$$

For the northern haul road there will be an expected 14,128 VKT per annum over 52 weeks at 16 hours per weekday and 11 hours per Saturday the average TSP emission rate is:

$$m_{TSP} = \frac{0.1808 \frac{kg}{VKT} \times 14{,}128 \frac{VKT}{year} \times 1000 \frac{g}{kg}}{52 \frac{week}{year} \times \left(5 \frac{day}{week} \times 16 \frac{h}{day} + 1 \frac{day}{week} \times 11 \frac{h}{day}\right) \times 3600 \frac{s}{h}}$$

$$m_{TSP} = 0.14991 \frac{g}{s}$$

Applying a control factor of 75% (i.e. 25% of the uncontrolled emission rate):

$$m_{TSP} = 0.19214 \frac{g}{s} \times 25\%$$

$$m_{TSP} = 0.04804 \frac{g}{s}$$

Other Emission Factors Used

The following table lists the other emission factors used in determining the emission factors for the Oberon Quarry Air Quality Impact Assessment:

Operation	E_{TSP} (kg/T)	E_{PM10} (kg/T)	Reference
Haul Truck Dumping into Hopper	-	8.0×10^{-6}	Table 11.19.2-1 Truck Unloading - Fragmented stone US EPA - AP42 Chapter 11
Primary Crushing	0.00035	-	Table 21 - Primary crushing NPI Emission Estimation Technique Manual for Mining and Processing of Non-Metallic Minerals Version 2, 2000
Secondary Crushing	0.0027	0.0012	Table 11.19.2-1 Secondary Crushing US EPA - AP42 Chapter 11
Screening	0.0125	0.0043	Table 11.19.2-1 Screening US EPA - AP42 Chapter 11
Fines Screening	0.15	0.036	Table 11.19.2-1 Fines Screening US EPA - AP42 Chapter 11
Conveyor Transfer Point	0.0015	0.00055	Table 11.19.2-1 Conveyor Transfer Point US EPA - AP42 Chapter 11
Wind Erosion from Disturbed Areas and Stockpiles	-	3.9 kg/ha/day	Table 6 - Wind erosion from sand and aggregate storage piles NPI Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing, 1999

Where specific emission factors for either Total Suspended Particulate (TSP) or PM10 were unavailable it has been assumed that the PM10 emissions are equal to 40% of the TSP emission for a given emission source.

Emission rates are estimated using the above emission factors and either the annual tonnes processed averaged over the operating hours, or in the case of windblown dust the emission rates, the total disturbed area for 24 hours per day.

APPENDIX C

AUSPLUME Output Files

Appendix C – Ausplume Input/Output Files

Note: Gridded Receptor Results have been removed from this Appendix for clarity. Gridded Receptor Results are available upon request.

PM10 24 Hour Average

```
 6.0 version
************************************************************
* WARNING - WARNING - WARNING - WARNING - WARNING - WARNING *
*                                                          *
* This is a generated file. Please do not edit it manually. *
* If  editing  is  required, under any circumstances do not *
* edit information enclosed in curly braces.  Corruption of *
* this information or changed order of data blocks enclosed *
* in curly braces may render the file unusable.            *
*                                                          *
************************************************************

Simulation Title
{Oberon Quarry - Version 1}
Concentration(1)/Deposition(0), Emission rate units, Concentration/Deposition units,Background Concentration, Variable Background flag,Variable Emission Flag
{True grams/second microgram/m3 0 False False }

Terrain influence tag, 0-ignore, 1 - include
{2}
Egan coefficients
{0.5 0.5 0.5 0.5 0.7 0.7 }
Number of source groups
{2}
Total number of sources (Stack + Area + Volume sources)
{32}

Source Group information
Total Number of Sources in Group 1
{32}
Sources in Source Group 1
{A1a  A1b  A2  A3  A1c  A4  A5  V12  L1a  L1b  L1c  L1d  L1e  L1f  L1g  L1h  V1  V2  V3  V4  V5  V6  V7  V9  V10  V11  V8  V13  L2a  L2b  L2c  L2d  }
Total Number of Sources in Group 2
{7}
Sources in Source Group 2
{A1a  A1b  A2  A3  A1c  A4  A5  }
BPIP Run (1-True, 0-False)
{0 }
Total number of buildings
{0 }

Source Information

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1a 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
```

Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000004}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 198 181 20 0 20 0 }
Base shape point coordinates
{763765 6263022 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1b 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000006}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 194 281 20 0 20 0 }
Base shape point coordinates
{763671 6262756 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A2 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000002}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 115 176 20 0 20 0 }
Base shape point coordinates
{763529 6262621 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A3 2 0 0 1162 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000003}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 139 194 20 0 20 0 }
Base shape point coordinates

{763574 6262408 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1c 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000003}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 160 169 20 0 20 0 }
Base shape point coordinates
{763640 6262590 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A4 2 0 0 1151 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000001}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 90 145 20 0 20 0 }
Base shape point coordinates
{763801 6262346 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A5 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000002}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 217 78 20 0 20 0 }
Base shape point coordinates
{763808 6263195 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V1 3 763869 6262462 1129 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.25 3.5 }

Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V2 3 763869 6262446 1128 }
Source height
{3 0 }
Side length, Effective Radius
{0.75 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V3 3 763878 6262444 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 6 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V4 3 763881 6262414 1128 }
Source height
{2.5 0 }
Side length, Effective Radius
{2 2.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V5 3 763868 6262387 1128 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.75 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V6 3 763860 6262395 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 4 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions

{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V7 3 763881 6262385 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 4 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V9 3 763853 6262376 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V10 3 763856 6262367 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V11 3 763867 6262369 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V8 3 763862 6262375 1128 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.5 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate

{0 0 0 0 0 0 0 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V12 3 763884 6263125 1154 }
Source height
{2 0 }
Side length, Effective Radius
{2 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V13 3 763835 6262397 1131 }
Source height
{2 0 }
Side length, Effective Radius
{2 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1a 3 763881 6263110 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1b 3 763865 6263010 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1c 3 763845 6262912 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions

{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1d 3 763810 6262812 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1e 3 763786 6262715 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1f 3 763765 6262613 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1g 3 763783 6262533 1151 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1h 3 763874 6262502 1137 }
Source height
{2 0 }
Side length, Effective Radius

{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2a 3 763859 6262307 1126 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2b 3 763839 6262372 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2c 3 763881 6262431 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2d 3 763892 6262368 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0 0 }

Receptor information

Discrete receptors
Receptor coordinates type (1-Cartesian,0-Polar),Number of Receptors
{1 14 }
X, Y coordinates and Elevation

{765158 6262213 0 }
X, Y coordinates and Elevation
{762633 6263714 0 }
X, Y coordinates and Elevation
{766021 6264384 0 }
X, Y coordinates and Elevation
{764005 6263656 0 }
X, Y coordinates and Elevation
{764244 6263646 0 }
X, Y coordinates and Elevation
{761805 6261925 0 }
X, Y coordinates and Elevation
{761015 6263361 0 }
X, Y coordinates and Elevation
{765425 6263525 0 }
X, Y coordinates and Elevation
{762712 6264351 0 }
X, Y coordinates and Elevation
{764367 6263964 0 }
X, Y coordinates and Elevation
{764234 6263026 0 }
X, Y coordinates and Elevation
{763689 6262943 0 }
X, Y coordinates and Elevation
{765079 6262924 0 }
X, Y coordinates and Elevation
{764247 6262126 0 }

Gridded receptors
Receptor coordinates type (1-Cartesian, 0-Polar), Number of X and Y coordinates, Receptor height
{1 69 58 0 }

X grid coordinates
{760332 760432 760532 760632 760732 760832 760932 761032 761132 761232 761332 761432 761532 761632 761732 761832 761932 762032 762132 762232 762332 762432 762532 762632 762732 762832 762932 763032 763132 763232 763332 763432 763532 763632 763732 763832 763932 764032 764132 764232 764332 764432 764532 764632 764732 764832 764932 765032 765132 765232 765332 765432 765532 765632 765732 765832 765932 766032 766132 766232 766332 766432 766532 766632 766732 766832 766932 767032 767132 }

Y grid coordinates
{6259493 6259593 6259693 6259793 6259893 6259993 6260093 6260193 6260293 6260393 6260493 6260593 6260693 6260793 6260893 6260993 6261093 6261193 6261293 6261393 6261493 6261593 6261693 6261793 6261893 6261993 6262093 6262193 6262293 6262393 6262493 6262593 6262693 6262793 6262893 6262993 6263093 6263193 6263293 6263393 6263493 6263593 6263693 6263793 6263893 6263993 6264093 6264193 6264293 6264393 6264493 6264593 6264693 6264793 6264893 6264993 6265093 6265193 }

Model settings and parameters
Emission conversion factor, Averaging Time
{1000000 0 }

Land use (surface roughness)
{0.4}

Averaging time flags (1,2,3,4,6,8,12,24 hrs, 7, 90 days, 3 month, All hrs
{0 0 0 0 0 0 0 1 0 0 0 0 }

Statistical output options
{0 0 }

Output options (All meteodata, Every concentration/deposition, Highest/2nd highest, 100 worst case table, Save all calculations
{0 0 1 0 0 0 }
Write concentration (1-yes, 0-no), Concentration rank, Write frequency, Frequency Level
{1 1 1 30 }

Disregard exponents (1-yes, 0-no), Exponent Scheme (1-Irvin urban, 2-Irvin rural, 3-ISCST, 4-User Defined
{0 2 }
Dispersion exponents
{0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.2 0.2 0.2 0.2 0.2 0.2 0.25 0.25 0.25 0.25 0.25 0.25 0.4 0.4 0.4 0.4 0.4 0.4 0.6 0.6 0.6 0.6 0.6 0.6 }

Building wake effects (1-include,0-not) , Default decay coefficient, Anemometr height, Sigma-theta averaging period, Roughness at vane site, Smooth stability changes, ConvectivePDF)
{0 0 10 60 0.3 0 0 }

Deposition options, Depletion options
{False False False False False False }

Stability class adjustments (0-None, 1-Urban1, 2-Urban2)
{0}
Building wake algorithms (1-Huber-Sneider, 2-Hybrid, 3-Schulman-Scire)
{4}

Gradual plume rise (1-yes,0-no), Stack tip downwash (1-yes,0-no), Disregard Temperature Gradient (1-yes,0-no), Partial Penetration, Temp Gradient, Adiabatic Entrainment, Stable Entrainment
{1 1 0 0 0.004 0.6 0.6 }
Temperature Gradients for Wind and Stability categories
{0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.02 0.02 0.02 0.02 0.02 0.02 0.035 0.035 0.035 0.035 0.035 0.035 }

Dispersion curves (1-Pasquill Gifford, 2- Briggs rural, 3-Sigma theta) horizontal < 100 m, ditto vertical < 100 m, ditto horizontal > 100 m, ditto vertical > 100 m
{3 1 2 2 }
Adjust PG curves for roughness - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Enhance plume for buyoancy - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Adjust for wind direction shear
{0}
Shear rates
{0.005 0.01 0.015 0.02 0.025 0.035 }

Wind Speed categories
{1.54 3.09 5.14 8.23 10.8 }

Output file
{'N:\1296_Oberon\Air\PM10_24h_V1.txt'}
Meteorological file
{'N:\1296_Oberon\Air\Oberon.met'}
Receptor file
{'N:\1296_Oberon\Air\1296_V1.ter'}
Concentration file
{'N:\1296_Oberon\Air\PM10_24h_V1.dat'}
Frequency File
{'N:\1296_Oberon\Air\PM10_24h_V1.frq'}

1 _____

Oberon Quarry - Version 1

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Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00

Terrain effects Egan method
Smooth stability class changes? No
Other stability class adjustments ("urban modes") None
Ignore building wake effects? Yes
Decay coefficient (unless overridden by met. file) 0.000
Anemometer height 10 m
Roughness height at the wind vane site 0.300 m
Averaging time for sigma-theta values 60 min.

DISPERSION CURVES
Horizontal dispersion curves for sources <100m high Sigma-theta
Vertical dispersion curves for sources <100m high Pasquill-Gifford
Horizontal dispersion curves for sources >100m high Briggs Rural
Vertical dispersion curves for sources >100m high Briggs Rural
Enhance horizontal plume spreads for buoyancy? Yes
Enhance vertical plume spreads for buoyancy? Yes
Adjust horizontal P-G formulae for roughness height? Yes
Adjust vertical P-G formulae for roughness height? Yes
Roughness height 0.400m
Adjustment for wind directional shear None

PLUME RISE OPTIONS
Gradual plume rise? Yes
Stack-tip downwash included? Yes
Building downwash algorithm: PRIME method.
Entrainment coeff. for neutral & stable lapse rates 0.60,0.60
Partial penetration of elevated inversions? No
Disregard temp. gradients in the hourly met. file? No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Rural" values (unless overridden by met. file)

AVERAGING TIMES
24 hours

Oberon Quarry - Version 1

SOURCE GROUPS

Group No. Members

1 A1A A1B A2 A3 A1C A4 A5
V12 L1A L1B L1C L1D L1E L1F

L1G L1H V1 V2 V3 V4 V5

V6 V7 V9 V10 V11 V8 V13

L2A L2B L2C L2D
2 A1A A1B A2 A3 A1C A4 A5

1

Oberon Quarry - Version 1

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: A1A

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763765	6263022	1154m	198m	181m	20deg	2m	0m

(Constant) emission rate = 4.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A1B

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763671	6262756	1154m	194m	281m	20deg	2m	0m

(Constant) emission rate = 6.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A2

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763529	6262621	1154m	115m	176m	20deg	2m	0m

(Constant) emission rate = 2.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A3

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763574	6262408	1162m	139m	194m	20deg	2m	0m

(Constant) emission rate = 3.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A1C

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height

763640 6262590 1154m 160m 169m 20deg 2m 0m

(Constant) emission rate = 3.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A4

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763801	6262346	1151m	90m	145m	20deg	2m	0m

(Constant) emission rate = 1.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A5

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763808	6263195	1154m	217m	78m	20deg	2m	0m

(Constant) emission rate = 2.00E-06 grams/second per square metre
No gravitational settling or scavenging.

VOLUME SOURCE: V1

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763869	6262462	1129m	4m	1m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 2.29E-02
9 2.29E-02	10 2.29E-02	11 2.29E-02	12 2.29E-02
13 2.29E-02	14 2.29E-02	15 2.29E-02	16 2.29E-02
17 2.29E-02	18 2.29E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V2

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763869	6262446	1128m	3m	1m	3m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 2.35E-01
9 2.35E-01	10 2.35E-01	11 2.35E-01	12 2.35E-01
13 2.35E-01	14 2.35E-01	15 2.35E-01	16 2.35E-01
17 2.35E-01	18 2.35E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V3

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763878	6262444	1128m	6m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 1.81E-02
9 1.81E-02 10 1.81E-02 11 1.81E-02 12 1.81E-02
13 1.81E-02 14 1.81E-02 15 1.81E-02 16 1.81E-02
17 1.81E-02 18 1.81E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V4

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262414	1128m	3m	2m	3m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 1.12E-01
9 1.12E-01 10 1.12E-01 11 1.12E-01 12 1.12E-01
13 1.12E-01 14 1.12E-01 15 1.12E-01 16 1.12E-01
17 1.12E-01 18 1.12E-01 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V5

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763868	6262387	1128m	4m	2m	4m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 2.14E-01
9 2.14E-01 10 2.14E-01 11 2.14E-01 12 2.14E-01
13 2.14E-01 14 2.14E-01 15 2.14E-01 16 2.14E-01
17 2.14E-01 18 2.14E-01 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V6

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763860	6262395	1128m	4m	0m	1m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 1.81E-02
9 1.81E-02 10 1.81E-02 11 1.81E-02 12 1.81E-02
13 1.81E-02 14 1.81E-02 15 1.81E-02 16 1.81E-02
17 1.81E-02 18 1.81E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V7

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262385	1128m	4m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V9

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763853	6262376	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V10

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763856	6262367	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V11

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763867	6262369	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V8

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763862	6262375	1128m	4m	2m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 2.14E-01
9 2.14E-01	10 2.14E-01	11 2.14E-01	12 2.14E-01
13 2.14E-01	14 2.14E-01	15 2.14E-01	16 2.14E-01
17 2.14E-01	18 2.14E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V12

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763884	6263125	1154m	2m	2m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 2.69E-02	8 2.69E-02
9 2.69E-02	10 2.69E-02	11 2.69E-02	12 2.69E-02
13 2.69E-02	14 2.69E-02	15 2.69E-02	16 2.69E-02
17 2.69E-02	18 2.69E-02	19 2.69E-02	20 2.69E-02
21 2.69E-02	22 2.69E-02	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V13

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763835	6262397	1131m	2m	2m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 2.69E-02	8 2.69E-02
9 2.69E-02	10 2.69E-02	11 2.69E-02	12 2.69E-02
13 2.69E-02	14 2.69E-02	15 2.69E-02	16 2.69E-02
17 2.69E-02	18 2.69E-02	19 2.69E-02	20 2.69E-02
21 2.69E-02	22 2.69E-02	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1A

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6263110	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.43E-03	8 1.43E-03
9 1.43E-03	10 1.43E-03	11 1.43E-03	12 1.43E-03
13 1.43E-03	14 1.43E-03	15 1.43E-03	16 1.43E-03
17 1.43E-03	18 1.43E-03	19 1.43E-03	20 1.43E-03
21 1.43E-03	22 1.43E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1B

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763865	6263010	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.43E-03	8 1.43E-03
9 1.43E-03	10 1.43E-03	11 1.43E-03	12 1.43E-03
13 1.43E-03	14 1.43E-03	15 1.43E-03	16 1.43E-03
17 1.43E-03	18 1.43E-03	19 1.43E-03	20 1.43E-03
21 1.43E-03	22 1.43E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1C

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763845	6262912	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.43E-03	8 1.43E-03
9 1.43E-03	10 1.43E-03	11 1.43E-03	12 1.43E-03
13 1.43E-03	14 1.43E-03	15 1.43E-03	16 1.43E-03
17 1.43E-03	18 1.43E-03	19 1.43E-03	20 1.43E-03
21 1.43E-03	22 1.43E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1D

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763810	6262812	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.43E-03	8 1.43E-03
9 1.43E-03	10 1.43E-03	11 1.43E-03	12 1.43E-03
13 1.43E-03	14 1.43E-03	15 1.43E-03	16 1.43E-03
17 1.43E-03	18 1.43E-03	19 1.43E-03	20 1.43E-03
21 1.43E-03	22 1.43E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1E

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763786	6262715	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.43E-03	8 1.43E-03
9 1.43E-03	10 1.43E-03	11 1.43E-03	12 1.43E-03
13 1.43E-03	14 1.43E-03	15 1.43E-03	16 1.43E-03
17 1.43E-03	18 1.43E-03	19 1.43E-03	20 1.43E-03
21 1.43E-03	22 1.43E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1F

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763765	6262613	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.43E-03	8 1.43E-03
9 1.43E-03	10 1.43E-03	11 1.43E-03	12 1.43E-03
13 1.43E-03	14 1.43E-03	15 1.43E-03	16 1.43E-03
17 1.43E-03	18 1.43E-03	19 1.43E-03	20 1.43E-03
21 1.43E-03	22 1.43E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1G

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763783	6262533	1151m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.43E-03	8 1.43E-03
9 1.43E-03	10 1.43E-03	11 1.43E-03	12 1.43E-03
13 1.43E-03	14 1.43E-03	15 1.43E-03	16 1.43E-03
17 1.43E-03	18 1.43E-03	19 1.43E-03	20 1.43E-03
21 1.43E-03	22 1.43E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1H

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763874	6262502	1137m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.43E-03	8 1.43E-03
9 1.43E-03	10 1.43E-03	11 1.43E-03	12 1.43E-03
13 1.43E-03	14 1.43E-03	15 1.43E-03	16 1.43E-03
17 1.43E-03	18 1.43E-03	19 1.43E-03	20 1.43E-03
21 1.43E-03	22 1.43E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2A

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763859	6262307	1126m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.00E-03	8 1.00E-03
9 1.00E-03	10 1.00E-03	11 1.00E-03	12 1.00E-03
13 1.00E-03	14 1.00E-03	15 1.00E-03	16 1.00E-03
17 1.00E-03	18 1.00E-03	19 1.00E-03	20 1.00E-03
21 1.00E-03	22 1.00E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2B

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763839	6262372	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.00E-03	8 1.00E-03
9 1.00E-03	10 1.00E-03	11 1.00E-03	12 1.00E-03
13 1.00E-03	14 1.00E-03	15 1.00E-03	16 1.00E-03
17 1.00E-03	18 1.00E-03	19 1.00E-03	20 1.00E-03
21 1.00E-03	22 1.00E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2C

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262431	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.00E-03	8 1.00E-03
9 1.00E-03	10 1.00E-03	11 1.00E-03	12 1.00E-03
13 1.00E-03	14 1.00E-03	15 1.00E-03	16 1.00E-03
17 1.00E-03	18 1.00E-03	19 1.00E-03	20 1.00E-03
21 1.00E-03	22 1.00E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2D

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763892	6262368	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.00E-03	8 1.00E-03
9 1.00E-03	10 1.00E-03	11 1.00E-03	12 1.00E-03
13 1.00E-03	14 1.00E-03	15 1.00E-03	16 1.00E-03
17 1.00E-03	18 1.00E-03	19 1.00E-03	20 1.00E-03
21 1.00E-03	22 1.00E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

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Oberon Quarry - Version 1

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):

760332.m 760432.m 760532.m 760632.m 760732.m 760832.m 760932.m
761032.m 761132.m 761232.m 761332.m 761432.m 761532.m 761632.m
761732.m 761832.m 761932.m 762032.m 762132.m 762232.m 762332.m
762432.m 762532.m 762632.m 762732.m 762832.m 762932.m 763032.m
763132.m 763232.m 763332.m 763432.m 763532.m 763632.m 763732.m
763832.m 763932.m 764032.m 764132.m 764232.m 764332.m 764432.m
764532.m 764632.m 764732.m 764832.m 764932.m 765032.m 765132.m
765232.m 765332.m 765432.m 765532.m 765632.m 765732.m 765832.m
765932.m 766032.m 766132.m 766232.m 766332.m 766432.m 766532.m
766632.m 766732.m 766832.m 766932.m 767032.m 767132.m

and these y-values (or northings):
6259493.m 6259593.m 6259693.m 6259793.m 6259893.m 6259993.m 6260093.m
6260193.m 6260293.m 6260393.m 6260493.m 6260593.m 6260693.m 6260793.m
6260893.m 6260993.m 6261093.m 6261193.m 6261293.m 6261393.m 6261493.m
6261593.m 6261693.m 6261793.m 6261893.m 6261993.m 6262093.m 6262193.m
6262293.m 6262393.m 6262493.m 6262593.m 6262693.m 6262793.m 6262893.m
6262993.m 6263093.m 6263193.m 6263293.m 6263393.m 6263493.m 6263593.m
6263693.m 6263793.m 6263893.m 6263993.m 6264093.m 6264193.m 6264293.m
6264393.m 6264493.m 6264593.m 6264693.m 6264793.m 6264893.m 6264993.m
6265093.m 6265193.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	765158	6262213	1194	0.0	9	765425	6263525	1119	0.0
2	762633	6263714	1079	0.0	10	762712	6264351	1082	0.0
3	764396	6263293	1094	0.0	11	764367	6263964	1122	0.0
4	766021	6264384	1141	0.0	12	764234	6263026	1110	0.0
5	764005	6263656	1140	0.0	13	763689	6262943	1164	0.0
6	764244	6263646	1137	0.0	14	765079	6262924	1113	0.0
7	761805	6261925	1098	0.0	15	764247	6262126	1101	0.0
8	761015	6263361	1097	0.0					

METEOROLOGICAL DATA : TAPM Generated Data for Oberon Sydney Uair Z0-0.3 A
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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 1

At the discrete receptors:

1: 7.31E+00 @Hr24,29/06/08
2: 9.74E+00 @Hr24,06/06/08
3: 1.85E+01 @Hr24,05/05/08
4: 4.06E+00 @Hr24,05/05/08
5: 2.39E+01 @Hr24,29/07/08
6: 2.23E+01 @Hr24,16/07/08
7: 5.70E+00 @Hr24,17/03/08
8: 5.22E+00 @Hr24,23/05/08
9: 5.02E+00 @Hr24,30/07/08
10: 7.96E+00 @Hr24,06/06/08
11: 1.36E+01 @Hr24,16/07/08
12: 2.63E+01 @Hr24,15/07/08
13: 1.05E+02 @Hr24,10/05/08
14: 8.14E+00 @Hr24,27/05/08
15: 2.82E+01 @Hr24,14/07/08

PM10 Annual Average

```
 6.0 version
************************************************************
* WARNING - WARNING - WARNING - WARNING - WARNING - WARNING *
*                                                          *
* This is a generated file. Please do not edit it manually. *
* If  editing  is  required, under any circumstances do not *
* edit information enclosed in curly braces.  Corruption of *
* this information or changed order of data blocks enclosed *
* in curly braces may render the file unusable.            *
*                                                          *
************************************************************

Simulation Title
{Oberon Quarry - Version 1}
Concentration(1)/Deposition(0), Emission rate units, Concentration/Deposition units,Background Concentration, Variable Background flag,Variable Emission Flag
{True grams/second microgram/m3 0 False False }

Terrain influence tag, 0-ignore, 1 - include
{2}
Egan coefficients
{0.5 0.5 0.5 0.5 0.7 0.7 }
Number of source groups
{2}
Total number of sources (Stack + Area + Volume sources)
{32}

Source Group information
Total Number of Sources in Group 1
{32}
Sources in Source Group 1
{A1a  A1b  A2  A3  A1c  A4  A5  V12  L1a  L1b  L1c  L1d  L1e  L1f  L1g  L1h  V1  V2  V3  V4  V5  V6  V7  V9  V10  V11  V8  V13  L2a  L2b  L2c  L2d  }
Total Number of Sources in Group 2
{7}
Sources in Source Group 2
{A1a  A1b  A2  A3  A1c  A4  A5  }
BPIP Run (1-True, 0-False)
{0 }
Total number of buildings
{0 }

Source Information

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1a 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000004}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 198 181 20 0 20 0 }
```

Base shape point coordinates
{763765 6263022 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1b 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000006}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 194 281 20 0 20 0 }
Base shape point coordinates
{763671 6262756 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A2 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000002}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 115 176 20 0 20 0 }
Base shape point coordinates
{763529 6262621 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A3 2 0 0 1162 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000003}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 139 194 20 0 20 0 }
Base shape point coordinates
{763574 6262408 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1c 2 0 0 1154 }
Source height
{0 0 }
Source Shape

{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000003}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 160 169 20 0 20 0 }
Base shape point coordinates
{763640 6262590 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A4 2 0 0 1151 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000001}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 90 145 20 0 20 0 }
Base shape point coordinates
{763801 6262346 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A5 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000002}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 217 78 20 0 20 0 }
Base shape point coordinates
{763808 6263195 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V1 3 763869 6262462 1129 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.25 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0.02295 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates

{V2 3 763869 6262446 1128 }
Source height
{3 0 }
Side length, Effective Radius
{0.75 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0.23504 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V3 3 763878 6262444 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 6 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V4 3 763881 6262414 1128 }
Source height
{2.5 0 }
Side length, Effective Radius
{2 2.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0.11177 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V5 3 763868 6262387 1128 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.75 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V6 3 763860 6262395 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 4 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V7 3 763881 6262385 1128 }
Source height

{0.5 0 }
Side length, Effective Radius
{0.25 4 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V9 3 763853 6262376 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V10 3 763856 6262367 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V11 3 763867 6262369 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0.01808 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V8 3 763862 6262375 1128 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.5 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0.21368 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V12 3 763884 6263125 1154 }
Source height
{2 0 }
Side length, Effective Radius

{2 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V13 3 763835 6262397 1131 }
Source height
{2 0 }
Side length, Effective Radius
{2 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0.02691 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1a 3 763881 6263110 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1b 3 763865 6263010 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1c 3 763845 6262912 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1d 3 763810 6262812 1154 }

Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1e 3 763786 6262715 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1f 3 763765 6262613 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1g 3 763783 6262533 1151 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1h 3 763874 6262502 1137 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0.0014341 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2a 3 763859 6262307 1126 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2b 3 763839 6262372 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2c 3 763881 6262431 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2d 3 763892 6262368 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0 0 }

Receptor information

Discrete receptors
Receptor coordinates type (1-Cartesian,0-Polar),Number of Receptors
{1 14 }
X, Y coordinates and Elevation
{765158 6262213 0 }
X, Y coordinates and Elevation
{762633 6263714 0 }
X, Y coordinates and Elevation
{766021 6264384 0 }
X, Y coordinates and Elevation
{764005 6263656 0 }

X, Y coordinates and Elevation
{764244 6263646 0 }
X, Y coordinates and Elevation
{761805 6261925 0 }
X, Y coordinates and Elevation
{761015 6263361 0 }
X, Y coordinates and Elevation
{765425 6263525 0 }
X, Y coordinates and Elevation
{762712 6264351 0 }
X, Y coordinates and Elevation
{764367 6263964 0 }
X, Y coordinates and Elevation
{764234 6263026 0 }
X, Y coordinates and Elevation
{763689 6262943 0 }
X, Y coordinates and Elevation
{765079 6262924 0 }
X, Y coordinates and Elevation
{764247 6262126 0 }

Gridded receptors
Receptor coordinates type (1-Cartesian, 0-Polar), Number of X and Y coordinates, Receptor height
{1 69 58 0 }

X grid coordinates
{760332 760432 760532 760632 760732 760832 760932 761032 761132 761232 761332 761432 761532 761632 761732 761832 761932 762032 762132 762232 762332 762432 762532 762632 762732 762832 762932 763032 763132 763232 763332 763432 763532 763632 763732 763832 763932 764032 764132 764232 764332 764432 764532 764632 764732 764832 764932 765032 765132 765232 765332 765432 765532 765632 765732 765832 765932 766032 766132 766232 766332 766432 766532 766632 766732 766832 766932 767032 767132 }

Y grid coordinates
{6259493 6259593 6259693 6259793 6259893 6259993 6260093 6260193 6260293 6260393 6260493 6260593 6260693 6260793 6260893 6260993 6261093 6261193 6261293 6261393 6261493 6261593 6261693 6261793 6261893 6261993 6262093 6262193 6262293 6262393 6262493 6262593 6262693 6262793 6262893 6262993 6263093 6263193 6263293 6263393 6263493 6263593 6263693 6263793 6263893 6263993 6264093 6264193 6264293 6264393 6264493 6264593 6264693 6264793 6264893 6264993 6265093 6265193 }

Model settings and parameters
Emission conversion factor, Averaging Time
{1000000 0 }

Land use (surface roughness)
{0.4}

Averaging time flags (1,2,3,4,6,8,12,24 hrs, 7, 90 days, 3 month, All hrs
{0 0 0 0 0 0 0 0 0 0 0 1 }

Statistical output options
{0 0 }

Output options (All meteodata, Every concentration/deposition, Highest/2nd highest, 100 worst case table, Save all calculations
{0 0 1 0 0 0 }
Write concentration (1-yes, 0-no), Concentration rank, Write frequency, Frequency Level
{1 1 0 30 }

Disregard exponents (1-yes, 0-no), Exponent Scheme (1-Irvin urban, 2-Irvin rural, 3-ISCST, 4-User Defined
{0 2 }
Dispersion exponents
{0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.2 0.2 0.2 0.2 0.2 0.2 0.25 0.25 0.25 0.25 0.25 0.25 0.4 0.4 0.4 0.4 0.4 0.4 0.6 0.6 0.6 0.6 0.6 0.6 0.6 }

Building wake effects (1-include,0-not) , Default decay coefficient, Anemometr height, Sigma-theta averaging period, Roughness at vane site, Smooth stability changes, ConvectivePDF)
{0 0 10 60 0.3 0 0 }

Deposition options, Depletion options
{False False False False False False }

Stability class adjustments (0-None, 1-Urban1, 2-Urban2)
{0}
Building wake algorithms (1-Huber-Sneider, 2-Hybrid, 3-Schulman-Scire)
{4}

Gradual plume rise (1-yes,0-no), Stack tip downwash (1-yes,0-no), Disregard Temperature Gradient (1-yes,0-no), Partial Penetration, Temp Gradient, Adiabatic Entrainment, Stable Entrainment
{1 1 0 0 0.004 0.6 0.6 }
Temperature Gradients for Wind and Stability categories
{0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.02 0.02 0.02 0.02 0.02 0.02 0.035 0.035 0.035 0.035 0.035 0.035 }

Dispersion curves (1-Pasquill Gifford, 2- Briggs rural, 3-Sigma theta) horizontal < 100 m, ditto vertical < 100 m, ditto horizontal > 100 m, ditto vertical > 100 m
{3 1 2 2 }
Adjust PG curves for roughness - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Enhance plume for buyoancy - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Adjust for wind direction shear
{0}
Shear rates
{0.005 0.01 0.015 0.02 0.025 0.035 }

Wind Speed categories
{1.54 3.09 5.14 8.23 10.8 }

Output file
{'N:\1296_Oberon\Air\PM10_Annual_V1.txt'}
Meteorological file
{'N:\1296_Oberon\Air\Oberon.met'}
Receptor file
{'N:\1296_Oberon\Air\1296_V1.ter'}
Concentration file
{'N:\1296_Oberon\Air\PM10_Annual_V1.dat'}

1 _____

Oberon Quarry - Version 1

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Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	Yes
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.300 m
Averaging time for sigma-theta values	60 min.

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high Sigma-theta
Vertical dispersion curves for sources <100m high Pasquill-Gifford
Horizontal dispersion curves for sources >100m high Briggs Rural
Vertical dispersion curves for sources >100m high Briggs Rural
Enhance horizontal plume spreads for buoyancy? Yes
Enhance vertical plume spreads for buoyancy? Yes
Adjust horizontal P-G formulae for roughness height? Yes
Adjust vertical P-G formulae for roughness height? Yes
Roughness height 0.400m
Adjustment for wind directional shear None

PLUME RISE OPTIONS

Gradual plume rise? Yes
Stack-tip downwash included? Yes
Building downwash algorithm: PRIME method.
Entrainment coeff. for neutral & stable lapse rates 0.60,0.60
Partial penetration of elevated inversions? No
Disregard temp. gradients in the hourly met. file? No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES

Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Rural" values (unless overridden by met. file)

AVERAGING TIMES

average over all hours

Oberon Quarry - Version 1

SOURCE GROUPS

Group No.	Members
1	A1A A1B A2 A3 A1C A4 A5 V12 L1A L1B L1C L1D L1E L1F L1G L1H V1 V2 V3 V4 V5 V6 V7 V9 V10 V11 V8 V13 L2A L2B L2C L2D

2 A1A A1B A2 A3 A1C A4 A5

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1 _____

Oberon Quarry - Version 1

SOURCE CHARACTERISTICS

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INTEGRATED AREA SOURCE: A1A

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763765	6263022	1154m	198m	181m	20deg	2m	0m

(Constant) emission rate = 4.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A1B

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763671	6262756	1154m	194m	281m	20deg	2m	0m

(Constant) emission rate = 6.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A2

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763529	6262621	1154m	115m	176m	20deg	2m	0m

(Constant) emission rate = 2.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A3

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763574	6262408	1162m	139m	194m	20deg	2m	0m

(Constant) emission rate = 3.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A1C

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763640	6262590	1154m	160m	169m	20deg	2m	0m

(Constant) emission rate = 3.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A4

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height

763801 6262346 1151m 90m 145m 20deg 2m 0m

(Constant) emission rate = 1.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A5

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763808	6263195	1154m	217m	78m	20deg	2m	0m

(Constant) emission rate = 2.00E-06 grams/second per square metre
No gravitational settling or scavenging.

VOLUME SOURCE: V1

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763869	6262462	1129m	4m	1m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 2.29E-02
9 2.29E-02	10 2.29E-02	11 2.29E-02	12 2.29E-02
13 2.29E-02	14 2.29E-02	15 2.29E-02	16 2.29E-02
17 2.29E-02	18 2.29E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V2

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763869	6262446	1128m	3m	1m	3m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 2.35E-01
9 2.35E-01	10 2.35E-01	11 2.35E-01	12 2.35E-01
13 2.35E-01	14 2.35E-01	15 2.35E-01	16 2.35E-01
17 2.35E-01	18 2.35E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V3

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763878	6262444	1128m	6m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V4

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262414	1128m	3m	2m	3m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.12E-01
9 1.12E-01	10 1.12E-01	11 1.12E-01	12 1.12E-01
13 1.12E-01	14 1.12E-01	15 1.12E-01	16 1.12E-01
17 1.12E-01	18 1.12E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V5

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763868	6262387	1128m	4m	2m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 2.14E-01
9 2.14E-01	10 2.14E-01	11 2.14E-01	12 2.14E-01
13 2.14E-01	14 2.14E-01	15 2.14E-01	16 2.14E-01
17 2.14E-01	18 2.14E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V6

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763860	6262395	1128m	4m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V7

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262385	1128m	4m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V9

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763853	6262376	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V10

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763856	6262367	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V11

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763867	6262369	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 1.81E-02
9 1.81E-02	10 1.81E-02	11 1.81E-02	12 1.81E-02
13 1.81E-02	14 1.81E-02	15 1.81E-02	16 1.81E-02
17 1.81E-02	18 1.81E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V8

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763862	6262375	1128m	4m	2m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 2.14E-01
9 2.14E-01	10 2.14E-01	11 2.14E-01	12 2.14E-01
13 2.14E-01	14 2.14E-01	15 2.14E-01	16 2.14E-01
17 2.14E-01	18 2.14E-01	19 0.00E+00	20 0.00E+00

21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V12

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763884	6263125	1154m	2m	2m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 2.69E-02 8 2.69E-02
9 2.69E-02 10 2.69E-02 11 2.69E-02 12 2.69E-02
13 2.69E-02 14 2.69E-02 15 2.69E-02 16 2.69E-02
17 2.69E-02 18 2.69E-02 19 2.69E-02 20 2.69E-02
21 2.69E-02 22 2.69E-02 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V13

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763835	6262397	1131m	2m	2m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 2.69E-02 8 2.69E-02
9 2.69E-02 10 2.69E-02 11 2.69E-02 12 2.69E-02
13 2.69E-02 14 2.69E-02 15 2.69E-02 16 2.69E-02
17 2.69E-02 18 2.69E-02 19 2.69E-02 20 2.69E-02
21 2.69E-02 22 2.69E-02 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1A

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6263110	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 1.43E-03 8 1.43E-03
9 1.43E-03 10 1.43E-03 11 1.43E-03 12 1.43E-03
13 1.43E-03 14 1.43E-03 15 1.43E-03 16 1.43E-03
17 1.43E-03 18 1.43E-03 19 1.43E-03 20 1.43E-03
21 1.43E-03 22 1.43E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1B

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763865	6263010	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 1.43E-03 8 1.43E-03
9 1.43E-03 10 1.43E-03 11 1.43E-03 12 1.43E-03

13 1.43E-03 14 1.43E-03 15 1.43E-03 16 1.43E-03
17 1.43E-03 18 1.43E-03 19 1.43E-03 20 1.43E-03
21 1.43E-03 22 1.43E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1C

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763845	6262912	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 1.43E-03 8 1.43E-03
9 1.43E-03 10 1.43E-03 11 1.43E-03 12 1.43E-03
13 1.43E-03 14 1.43E-03 15 1.43E-03 16 1.43E-03
17 1.43E-03 18 1.43E-03 19 1.43E-03 20 1.43E-03
21 1.43E-03 22 1.43E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1D

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763810	6262812	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 1.43E-03 8 1.43E-03
9 1.43E-03 10 1.43E-03 11 1.43E-03 12 1.43E-03
13 1.43E-03 14 1.43E-03 15 1.43E-03 16 1.43E-03
17 1.43E-03 18 1.43E-03 19 1.43E-03 20 1.43E-03
21 1.43E-03 22 1.43E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1E

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763786	6262715	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 1.43E-03 8 1.43E-03
9 1.43E-03 10 1.43E-03 11 1.43E-03 12 1.43E-03
13 1.43E-03 14 1.43E-03 15 1.43E-03 16 1.43E-03
17 1.43E-03 18 1.43E-03 19 1.43E-03 20 1.43E-03
21 1.43E-03 22 1.43E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1F

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763765	6262613	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00

5 0.00E+00 6 0.00E+00 7 1.43E-03 8 1.43E-03
9 1.43E-03 10 1.43E-03 11 1.43E-03 12 1.43E-03
13 1.43E-03 14 1.43E-03 15 1.43E-03 16 1.43E-03
17 1.43E-03 18 1.43E-03 19 1.43E-03 20 1.43E-03
21 1.43E-03 22 1.43E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1G

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763783	6262533	1151m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 1.43E-03 8 1.43E-03
9 1.43E-03 10 1.43E-03 11 1.43E-03 12 1.43E-03
13 1.43E-03 14 1.43E-03 15 1.43E-03 16 1.43E-03
17 1.43E-03 18 1.43E-03 19 1.43E-03 20 1.43E-03
21 1.43E-03 22 1.43E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1H

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763874	6262502	1137m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 1.43E-03 8 1.43E-03
9 1.43E-03 10 1.43E-03 11 1.43E-03 12 1.43E-03
13 1.43E-03 14 1.43E-03 15 1.43E-03 16 1.43E-03
17 1.43E-03 18 1.43E-03 19 1.43E-03 20 1.43E-03
21 1.43E-03 22 1.43E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2A

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763859	6262307	1126m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 1.00E-03 8 1.00E-03
9 1.00E-03 10 1.00E-03 11 1.00E-03 12 1.00E-03
13 1.00E-03 14 1.00E-03 15 1.00E-03 16 1.00E-03
17 1.00E-03 18 1.00E-03 19 1.00E-03 20 1.00E-03
21 1.00E-03 22 1.00E-03 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2B

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763839	6262372	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.00E-03	8 1.00E-03
9 1.00E-03	10 1.00E-03	11 1.00E-03	12 1.00E-03
13 1.00E-03	14 1.00E-03	15 1.00E-03	16 1.00E-03
17 1.00E-03	18 1.00E-03	19 1.00E-03	20 1.00E-03
21 1.00E-03	22 1.00E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2C

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262431	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.00E-03	8 1.00E-03
9 1.00E-03	10 1.00E-03	11 1.00E-03	12 1.00E-03
13 1.00E-03	14 1.00E-03	15 1.00E-03	16 1.00E-03
17 1.00E-03	18 1.00E-03	19 1.00E-03	20 1.00E-03
21 1.00E-03	22 1.00E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2D

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763892	6262368	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 1.00E-03	8 1.00E-03
9 1.00E-03	10 1.00E-03	11 1.00E-03	12 1.00E-03
13 1.00E-03	14 1.00E-03	15 1.00E-03	16 1.00E-03
17 1.00E-03	18 1.00E-03	19 1.00E-03	20 1.00E-03
21 1.00E-03	22 1.00E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

1

Oberon Quarry - Version 1

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):

760332.m 760432.m 760532.m 760632.m 760732.m 760832.m 760932.m
761032.m 761132.m 761232.m 761332.m 761432.m 761532.m 761632.m
761732.m 761832.m 761932.m 762032.m 762132.m 762232.m 762332.m
762432.m 762532.m 762632.m 762732.m 762832.m 762932.m 763032.m
763132.m 763232.m 763332.m 763432.m 763532.m 763632.m 763732.m
763832.m 763932.m 764032.m 764132.m 764232.m 764332.m 764432.m
764532.m 764632.m 764732.m 764832.m 764932.m 765032.m 765132.m
765232.m 765332.m 765432.m 765532.m 765632.m 765732.m 765832.m
765932.m 766032.m 766132.m 766232.m 766332.m 766432.m 766532.m

766632.m 766732.m 766832.m 766932.m 767032.m 767132.m

and these y-values (or northings):
6259493.m 6259593.m 6259693.m 6259793.m 6259893.m 6259993.m 6260093.m
6260193.m 6260293.m 6260393.m 6260493.m 6260593.m 6260693.m 6260793.m
6260893.m 6260993.m 6261093.m 6261193.m 6261293.m 6261393.m 6261493.m
6261593.m 6261693.m 6261793.m 6261893.m 6261993.m 6262093.m 6262193.m
6262293.m 6262393.m 6262493.m 6262593.m 6262693.m 6262793.m 6262893.m
6262993.m 6263093.m 6263193.m 6263293.m 6263393.m 6263493.m 6263593.m
6263693.m 6263793.m 6263893.m 6263993.m 6264093.m 6264193.m 6264293.m
6264393.m 6264493.m 6264593.m 6264693.m 6264793.m 6264893.m 6264993.m
6265093.m 6265193.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	765158	6262213	1194	0.0	9	765425	6263525	1119	0.0
2	762633	6263714	1079	0.0	10	762712	6264351	1082	0.0
3	764396	6263293	1094	0.0	11	764367	6263964	1122	0.0
4	766021	6264384	1141	0.0	12	764234	6263026	1110	0.0
5	764005	6263656	1140	0.0	13	763689	6262943	1164	0.0
6	764244	6263646	1137	0.0	14	765079	6262924	1113	0.0
7	761805	6261925	1098	0.0	15	764247	6262126	1101	0.0
8	761015	6263361	1097	0.0					

METEOROLOGICAL DATA : TAPM Generated Data for Oberon Sydney Uair Z0-0.3 A
n

AVERAGE OVER ALL HOURS FOR SOURCE GROUP No. 1
in microgram/m3

Concentrations at the discrete receptors (No. : Value):

1:7.57E-01 2:7.58E-01 3:2.80E+00 4:3.82E-01 5:1.53E+00 6:1.68E+00 7:4.73E-01 8:5.58E-01
9:7.10E-01 10:3.47E-01 11:9.11E-01 12:5.16E+00 13:2.56E+01 14:1.02E+00 15:2.42E+00

TSP Annual Average

```
 6.0 version
************************************************************
* WARNING - WARNING - WARNING - WARNING - WARNING - WARNING *
*                                                          *
* This is a generated file. Please do not edit it manually. *
* If  editing  is  required, under any circumstances do not *
* edit information enclosed in curly braces.  Corruption of *
* this information or changed order of data blocks enclosed *
* in curly braces may render the file unusable.            *
*                                                          *
************************************************************

Simulation Title
{Oberon Quarry - Version 1}
Concentration(1)/Deposition(0), Emission rate units, Concentration/Deposition units,Background Concentration, Variable Background
flag,Variable Emission Flag
{True grams/second microgram/m3 0 False False }

Terrain influence tag, 0-ignore, 1 - include
{2}
Egan coefficients
{0.5 0.5 0.5 0.5 0.7 0.7 }
Number of source groups
{1}
Total number of sources (Stack + Area + Volume sources)
{32}

Source Group information
Total Number of Sources in Group 1
{32}
Sources in Source Group 1
{A1a  A1b  A2  A3  A1c  A4  A5  V1  V2  V3  V4  V5  V6  V7  V9  V10  V11  V8  V12  V13  L1a  L1b  L1c  L1d
L1e  L1f  L1g  L1h  L2a  L2b  L2c  L2d  }
BPIP Run (1-True, 0-False)
{0 }
Total number of buildings
{0 }

Source Information

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1a 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array,
Number of particle fractions
{1 0 }
Constant emission rate
{0.00001}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 198 181 20 0 20 0 }
Base shape point coordinates
{763765 6263022 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
```

{A1b 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000015}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 194 281 20 0 20 0 }
Base shape point coordinates
{763671 6262756 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A2 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000006}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 115 176 20 0 20 0 }
Base shape point coordinates
{763529 6262621 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A3 2 0 0 1162 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000008}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 139 194 20 0 20 0 }
Base shape point coordinates
{763574 6262408 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1c 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }

Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000008}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 160 169 20 0 20 0 }
Base shape point coordinates
{763640 6262590 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A4 2 0 0 1151 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000004}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 90 145 20 0 20 0 }
Base shape point coordinates
{763801 6262346 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A5 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000005}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 217 78 20 0 20 0 }
Base shape point coordinates
{763808 6263195 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V1 3 763869 6262462 1129 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.25 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V2 3 763869 6262446 1128 }
Source height
{3 0 }

Side length, Effective Radius
{0.75 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V3 3 763878 6262444 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 6 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V4 3 763881 6262414 1128 }
Source height
{2.5 0 }
Side length, Effective Radius
{2 2.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V5 3 763868 6262387 1128 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.75 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V6 3 763860 6262395 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 4 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V7 3 763881 6262385 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 4 }

Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V9 3 763853 6262376 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V10 3 763856 6262367 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V11 3 763867 6262369 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V8 3 763862 6262375 1128 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.5 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0 0 0 0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V12 3 763884 6263125 1154 }
Source height
{2 0 }
Side length, Effective Radius
{2 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions

{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V13 3 763835 6262397 1131 }
Source height
{2 0 }
Side length, Effective Radius
{2 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1a 3 763881 6263110 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1b 3 763865 6263010 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1c 3 763845 6262912 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1d 3 763810 6262812 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }

Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1e 3 763786 6262715 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1f 3 763765 6262613 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1g 3 763783 6262533 1151 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1h 3 763874 6262502 1137 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2a 3 763859 6262307 1126 }
Source height

{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2b 3 763839 6262372 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2c 3 763881 6262431 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2d 3 763892 6262368 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 0 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0 0 }

Receptor information

Discrete receptors
Receptor coordinates type (1-Cartesian,0-Polar),Number of Receptors
{1 14 }
X, Y coordinates and Elevation
{765158 6262213 0 }
X, Y coordinates and Elevation
{762633 6263714 0 }
X, Y coordinates and Elevation
{766021 6264384 0 }
X, Y coordinates and Elevation
{764005 6263656 0 }

X, Y coordinates and Elevation
{764244 6263646 0 }
X, Y coordinates and Elevation
{761805 6261925 0 }
X, Y coordinates and Elevation
{761015 6263361 0 }
X, Y coordinates and Elevation
{765425 6263525 0 }
X, Y coordinates and Elevation
{762712 6264351 0 }
X, Y coordinates and Elevation
{764367 6263964 0 }
X, Y coordinates and Elevation
{764234 6263026 0 }
X, Y coordinates and Elevation
{763689 6262943 0 }
X, Y coordinates and Elevation
{765079 6262924 0 }
X, Y coordinates and Elevation
{764247 6262126 0 }

Gridded receptors
Receptor coordinates type (1-Cartesian, 0-Polar), Number of X and Y coordinates, Receptor height
{1 69 58 0 }

X grid coordinates
{760332 760432 760532 760632 760732 760832 760932 761032 761132 761232 761332 761432 761532 761632 761732 76 1832 761932 762032 762132 762232 762332 762432 762532 762632 762732 762832 762932 763032 763132 763232 763332 763432 763532 763632 763732 763832 763932 764032 764132 764232 764332 764432 764532 764632 764732 764832 764932 765032 765132 765232 765332 765432 765532 765632 765732 765832 765932 766032 766132 766232 766332 766432 766532 766632 766732 766832 766932 767032 767132 }

Y grid coordinates
{6259493 6259593 6259693 6259793 6259893 6259993 6260093 6260193 6260293 6260393 6260493 6260593 6260693 6260793 6260893 6260993 6261093 6261193 6261293 6261393 6261493 6261593 6261693 6261793 6261893 6261993 6262093 6262193 6262293 6262393 6262493 6262593 6262693 6262793 6262893 6262993 6263093 6263193 6263293 6263393 6263493 6263593 6263693 6263793 6263893 6263993 6264093 6264193 6264293 6264393 6264493 6264593 6264693 6264793 6264893 6264993 6265093 6265193 }

Model settings and parameters
Emission conversion factor, Averaging Time
{1000000 0 }

Land use (surface roughness)
{0.4}

Averaging time flags (1,2,3,4,6,8,12,24 hrs, 7, 90 days, 3 month, All hrs
{0 0 0 0 0 0 0 0 0 0 0 1 }

Statistical output options
{0 0 }

Output options (All meteodata, Every concentration/deposition, Highest/2nd highest, 100 worst case table, Save all calculations
{0 0 0 1 0 0 }
Write concentration (1-yes, 0-no), Concentration rank, Write frequency, Frequency Level
{1 1 0 -1 }

Disregard exponents (1-yes, 0-no), Exponent Scheme (1-Irvin urban, 2-Irvin rural, 3-ISCST, 4-User Defined
{0 2 }
Dispersion exponents
{0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.2 0.2 0.2 0.2 0.2 0.2 0.25 0.25 0.25 0.25 0.25 0.25 0.4 0.4 0.4 0.4 0.4 0.4 0.6 0.6 0.6 0.6 0.6 0.6 }

Building wake effects (1-include,0-not) , Default decay coefficient, Anemometr height, Sigma-theta averaging period, Roughness at vane site, Smooth stability changes, ConvectivePDF)
{0 0 10 60 0.3 0 0 }

Deposition options, Depletion options
{False False False False False False }

Stability class adjustments (0-None, 1-Urban1, 2-Urban2)
{0}
Building wake algorithms (1-Huber-Sneider, 2-Hybrid, 3-Schulman-Scire)
{4}

Gradual plume rise (1-yes,0-no), Stack tip downwash (1-yes,0-no), Disregard Temperature Gradient (1-yes,0-no), Partial Penetration, Temp Gradient, Adiabatic Entrainment, Stable Entrainment
{1 1 0 0 0.004 0.6 0.6 }
Temperature Gradients for Wind and Stability categories
{0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.02 0.02 0.02 0.02 0.02 0.02 0.035 0.035 0.035 0.035 0.035 0.035 }

Dispersion curves (1-Pasquill Gifford, 2- Briggs rural, 3-Sigma theta) horizontal < 100 m, ditto vertical < 100 m, ditto horizontal > 100 m, ditto vertical > 100 m
{3 1 2 2 }
Adjust PG curves for roughness - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Enhance plume for buyoancy - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Adjust for wind direction shear
{0}
Shear rates
{0.005 0.01 0.015 0.02 0.025 0.035 }

Wind Speed categories
{1.54 3.09 5.14 8.23 10.8 }

Output file
{'N:\1296_Oberon\Air\TSP_Annual_V1.txt'}
Meteorological file
{'N:\1296_Oberon\Air\Oberon.met'}
Receptor file
{'N:\1296_Oberon\Air\1296_V1.ter'}
Concentration file
{'N:\1296_Oberon\Air\TSP_Annual_V1.dat'}

1 _____

Oberon Quarry - Version 1

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Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	Yes
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.300 m
Averaging time for sigma-theta values	60 min.

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high Sigma-theta
Vertical dispersion curves for sources <100m high Pasquill-Gifford
Horizontal dispersion curves for sources >100m high Briggs Rural
Vertical dispersion curves for sources >100m high Briggs Rural
Enhance horizontal plume spreads for buoyancy? Yes
Enhance vertical plume spreads for buoyancy? Yes
Adjust horizontal P-G formulae for roughness height? Yes
Adjust vertical P-G formulae for roughness height? Yes
Roughness height 0.400m
Adjustment for wind directional shear None

PLUME RISE OPTIONS

Gradual plume rise? Yes
Stack-tip downwash included? Yes
Building downwash algorithm: PRIME method.
Entrainment coeff. for neutral & stable lapse rates 0.60,0.60
Partial penetration of elevated inversions? No
Disregard temp. gradients in the hourly met. file? No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Rural" values (unless overridden by met. file)

AVERAGING TIMES
average over all hours

1

Oberon Quarry - Version 1

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: A1A

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763765	6263022	1154m	198m	181m	20deg	2m	0m

(Constant) emission rate = 1.00E-05 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A1B

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763671	6262756	1154m	194m	281m	20deg	2m	0m

(Constant) emission rate = 1.50E-05 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A2

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763529	6262621	1154m	115m	176m	20deg	2m	0m

(Constant) emission rate = 6.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A3

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763574	6262408	1162m	139m	194m	20deg	2m	0m

(Constant) emission rate = 8.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A1C

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763640	6262590	1154m	160m	169m	20deg	2m	0m

(Constant) emission rate = 8.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A4

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763801	6262346	1151m	90m	145m	20deg	2m	0m

(Constant) emission rate = 4.00E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: A5

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763808	6263195	1154m	217m	78m	20deg	2m	0m

(Constant) emission rate = 5.00E-06 grams/second per square metre
No gravitational settling or scavenging.

VOLUME SOURCE: V1

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763869	6262462	1129m	4m	1m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 6.15E-02

9 6.15E-02 10 6.15E-02 11 6.15E-02 12 6.15E-02
13 6.15E-02 14 6.15E-02 15 6.15E-02 16 6.15E-02
17 6.15E-02 18 6.15E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V2

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763869	6262446	1128m	3m	1m	3m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 6.48E-01
9 6.48E-01 10 6.48E-01 11 6.48E-01 12 6.48E-01
13 6.48E-01 14 6.48E-01 15 6.48E-01 16 6.48E-01
17 6.48E-01 18 6.48E-01 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V3

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763878	6262444	1128m	6m	0m	1m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 4.93E-02
9 4.93E-02 10 4.93E-02 11 4.93E-02 12 4.93E-02
13 4.93E-02 14 4.93E-02 15 4.93E-02 16 4.93E-02
17 4.93E-02 18 4.93E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V4

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262414	1128m	3m	2m	3m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 2.86E-01
9 2.86E-01 10 2.86E-01 11 2.86E-01 12 2.86E-01
13 2.86E-01 14 2.86E-01 15 2.86E-01 16 2.86E-01
17 2.86E-01 18 2.86E-01 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V5

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763868	6262387	1128m	4m	2m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 6.08E-01
9 6.08E-01 10 6.08E-01 11 6.08E-01 12 6.08E-01
13 6.08E-01 14 6.08E-01 15 6.08E-01 16 6.08E-01
17 6.08E-01 18 6.08E-01 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V6

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763860	6262395	1128m	4m	0m	1m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 4.93E-02
9 4.93E-02 10 4.93E-02 11 4.93E-02 12 4.93E-02
13 4.93E-02 14 4.93E-02 15 4.93E-02 16 4.93E-02
17 4.93E-02 18 4.93E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V7

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262385	1128m	4m	0m	1m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 4.93E-02
9 4.93E-02 10 4.93E-02 11 4.93E-02 12 4.93E-02
13 4.93E-02 14 4.93E-02 15 4.93E-02 16 4.93E-02
17 4.93E-02 18 4.93E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V9

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763853	6262376	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 4.93E-02
9 4.93E-02 10 4.93E-02 11 4.93E-02 12 4.93E-02
13 4.93E-02 14 4.93E-02 15 4.93E-02 16 4.93E-02
17 4.93E-02 18 4.93E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V10

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763856	6262367	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 4.93E-02
9 4.93E-02	10 4.93E-02	11 4.93E-02	12 4.93E-02
13 4.93E-02	14 4.93E-02	15 4.93E-02	16 4.93E-02
17 4.93E-02	18 4.93E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V11

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763867	6262369	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 4.93E-02
9 4.93E-02	10 4.93E-02	11 4.93E-02	12 4.93E-02
13 4.93E-02	14 4.93E-02	15 4.93E-02	16 4.93E-02
17 4.93E-02	18 4.93E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V8

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763862	6262375	1128m	4m	2m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 6.08E-01
9 6.08E-01	10 6.08E-01	11 6.08E-01	12 6.08E-01
13 6.08E-01	14 6.08E-01	15 6.08E-01	16 6.08E-01
17 6.08E-01	18 6.08E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V12

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763884	6263125	1154m	2m	2m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 5.69E-02	8 5.69E-02
9 5.69E-02	10 5.69E-02	11 5.69E-02	12 5.69E-02
13 5.69E-02	14 5.69E-02	15 5.69E-02	16 5.69E-02
17 5.69E-02	18 5.69E-02	19 5.69E-02	20 5.69E-02
21 5.69E-02	22 5.69E-02	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: V13

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763835	6262397	1131m	2m	2m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 5.69E-02	8 5.69E-02
9 5.69E-02	10 5.69E-02	11 5.69E-02	12 5.69E-02
13 5.69E-02	14 5.69E-02	15 5.69E-02	16 5.69E-02
17 5.69E-02	18 5.69E-02	19 5.69E-02	20 5.69E-02
21 5.69E-02	22 5.69E-02	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1A

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6263110	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1B

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763865	6263010	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1C

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763845	6262912	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1D

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763810	6262812	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1E

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763786	6262715	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1F

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763765	6262613	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1G

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763783	6262533	1151m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L1H

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763874	6262502	1137m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2A

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763859	6262307	1126m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 3.22E-03	8 3.22E-03
9 3.22E-03	10 3.22E-03	11 3.22E-03	12 3.22E-03
13 3.22E-03	14 3.22E-03	15 3.22E-03	16 3.22E-03
17 3.22E-03	18 3.22E-03	19 3.22E-03	20 3.22E-03
21 3.22E-03	22 3.22E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2B

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763839	6262372	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 3.22E-03	8 3.22E-03
9 3.22E-03	10 3.22E-03	11 3.22E-03	12 3.22E-03
13 3.22E-03	14 3.22E-03	15 3.22E-03	16 3.22E-03
17 3.22E-03	18 3.22E-03	19 3.22E-03	20 3.22E-03
21 3.22E-03	22 3.22E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2C

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262431	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 3.22E-03	8 3.22E-03
9 3.22E-03	10 3.22E-03	11 3.22E-03	12 3.22E-03
13 3.22E-03	14 3.22E-03	15 3.22E-03	16 3.22E-03
17 3.22E-03	18 3.22E-03	19 3.22E-03	20 3.22E-03
21 3.22E-03	22 3.22E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

VOLUME SOURCE: L2D

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763892	6262368	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 3.22E-03	8 3.22E-03
9 3.22E-03	10 3.22E-03	11 3.22E-03	12 3.22E-03
13 3.22E-03	14 3.22E-03	15 3.22E-03	16 3.22E-03
17 3.22E-03	18 3.22E-03	19 3.22E-03	20 3.22E-03
21 3.22E-03	22 3.22E-03	23 0.00E+00	24 0.00E+00

No gravitational settling or scavenging.

1

Oberon Quarry - Version 1

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):
760332.m 760432.m 760532.m 760632.m 760732.m 760832.m 760932.m
761032.m 761132.m 761232.m 761332.m 761432.m 761532.m 761632.m
761732.m 761832.m 761932.m 762032.m 762132.m 762232.m 762332.m
762432.m 762532.m 762632.m 762732.m 762832.m 762932.m 763032.m
763132.m 763232.m 763332.m 763432.m 763532.m 763632.m 763732.m
763832.m 763932.m 764032.m 764132.m 764232.m 764332.m 764432.m
764532.m 764632.m 764732.m 764832.m 764932.m 765032.m 765132.m
765232.m 765332.m 765432.m 765532.m 765632.m 765732.m 765832.m
765932.m 766032.m 766132.m 766232.m 766332.m 766432.m 766532.m
766632.m 766732.m 766832.m 766932.m 767032.m 767132.m

and these y-values (or northings):
6259493.m 6259593.m 6259693.m 6259793.m 6259893.m 6259993.m 6260093.m
6260193.m 6260293.m 6260393.m 6260493.m 6260593.m 6260693.m 6260793.m
6260893.m 6260993.m 6261093.m 6261193.m 6261293.m 6261393.m 6261493.m
6261593.m 6261693.m 6261793.m 6261893.m 6261993.m 6262093.m 6262193.m
6262293.m 6262393.m 6262493.m 6262593.m 6262693.m 6262793.m 6262893.m
6262993.m 6263093.m 6263193.m 6263293.m 6263393.m 6263493.m 6263593.m
6263693.m 6263793.m 6263893.m 6263993.m 6264093.m 6264193.m 6264293.m
6264393.m 6264493.m 6264593.m 6264693.m 6264793.m 6264893.m 6264993.m
6265093.m 6265193.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	765158	6262213	1194	0.0	9	765425	6263525	1119	0.0
2	762633	6263714	1079	0.0	10	762712	6264351	1082	0.0
3	764396	6263293	1094	0.0	11	764367	6263964	1122	0.0
4	766021	6264384	1141	0.0	12	764234	6263026	1110	0.0
5	764005	6263656	1140	0.0	13	763689	6262943	1164	0.0
6	764244	6263646	1137	0.0	14	765079	6262924	1113	0.0

7 761805 6261925 1098 0.0 15 764247 6262126 1101 0.0
8 761015 6263361 1097 0.0

METEOROLOGICAL DATA : TAPM Generated Data for Oberon Sydney Uair Z0-0.3 A
n

AVERAGE OVER ALL HOURS AND FOR ALL SOURCES
in microgram/m3

Concentrations at the discrete receptors (No. : Value):

1:2.00E+00 2:1.95E+00 3:7.14E+00 4:9.94E-01 5:3.90E+00 6:4.28E+00 7:1.25E+00 8:1.45E+00
9:1.85E+00 10:8.98E-01 11:2.34E+00 12:1.32E+01 13:6.46E+01 14:2.70E+00 15:6.54E+00

Dust Deposition Annual Average

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 6.0 version
************************************************************
* WARNING - WARNING - WARNING - WARNING - WARNING - WARNING *
*                                                          *
* This is a generated file. Please do not edit it manually. *
* If  editing  is  required, under any circumstances do not *
* edit information enclosed in curly braces.  Corruption of *
* this information or changed order of data blocks enclosed *
* in curly braces may render the file unusable.            *
*                                                          *
************************************************************

Simulation Title
{Oberon Quarry - Version 1}
Concentration(1)/Deposition(0), Emission rate units, Concentration/Deposition units,Background Concentration, Variable Background
flag,Variable Emission Flag
{False grams/second milligram/m2 0 False False }

Terrain influence tag, 0-ignore, 1 - include
{2}
Egan coefficients
{0.5 0.5 0.5 0.5 0.7 0.7 }
Number of source groups
{1}
Total number of sources (Stack + Area + Volume sources)
{32}

Source Group information
Total Number of Sources in Group 1
{32}
Sources in Source Group 1
{A1a  A1b  A2  A3  A1c  A4  A5  V1  V2  V3  V4  V5  V6  V7  V9  V10  V11  V8  V12  V13  L1a  L1b  L1c  L1d
L1e  L1f  L1g  L1h  L2a  L2b  L2c  L2d  }
BPIP Run (1-True, 0-False)
{0 }
Total number of buildings
{0 }

Source Information

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1a 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array,
Number of particle fractions
{1 3 }
Constant emission rate
{0.00001}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 198 181 20 0 20 0 }
Base shape point coordinates
{763765 6263022 }
Deposition fraction proportions
{0.05 0.35 0.6 }
```

Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1b 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 3 }
Constant emission rate
{0.000015}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 194 281 20 0 20 0 }
Base shape point coordinates
{763671 6262756 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A2 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 3 }
Constant emission rate
{0.000006}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 115 176 20 0 20 0 }
Base shape point coordinates
{763529 6262621 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }

Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A3 2 0 0 1162 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 3 }
Constant emission rate
{0.000008}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 139 194 20 0 20 0 }
Base shape point coordinates
{763574 6262408 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A1c 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 3 }
Constant emission rate
{0.000008}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 160 169 20 0 20 0 }
Base shape point coordinates
{763640 6262590 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A4 2 0 0 1151 }
Source height

{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 3 }
Constant emission rate
{0.000004}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 90 145 20 0 20 0 }
Base shape point coordinates
{763801 6262346 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{A5 2 0 0 1154 }
Source height
{0 0 }
Source Shape
{4 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 3 }
Constant emission rate
{0.000005}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{2 217 78 20 0 20 0 }
Base shape point coordinates
{763808 6263195 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V1 3 763869 6262462 1129 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.25 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }

Hourly emission rate
{0 0 0 0 0 0 0 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0.06147 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V2 3 763869 6262446 1128 }
Source height
{3 0 }
Side length, Effective Radius
{0.75 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0.6476 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V3 3 763878 6262444 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 6 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V4 3 763881 6262414 1128 }
Source height
{2.5 0 }
Side length, Effective Radius

{2 2.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0.286 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V5 3 763868 6262387 1128 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.75 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V6 3 763860 6262395 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 4 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates

{V7 3 763881 6262385 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 4 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V9 3 763853 6262376 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V10 3 763856 6262367 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }

Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V11 3 763867 6262369 1128 }
Source height
{0.5 0 }
Side length, Effective Radius
{0.25 3 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0.04931 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V8 3 763862 6262375 1128 }
Source height
{3.5 0 }
Side length, Effective Radius
{1.5 3.5 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0.60815 0 0 0 0 0 0 }
Deposition fraction proportions
{0.05 0.35 0.6 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V12 3 763884 6263125 1154 }
Source height
{2 0 }
Side length, Effective Radius
{2 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0 0 }
Deposition fraction proportions
{0.05 0.45 0.5 }
Particle sizes
{2.5 10 30 }

Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{V13 3 763835 6262397 1131 }
Source height
{2 0 }
Side length, Effective Radius
{2 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0.0569 0 0 }
Deposition fraction proportions
{0.05 0.45 0.5 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1a 3 763881 6263110 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1b 3 763865 6263010 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate

{0 0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1c 3 763845 6262912 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1d 3 763810 6262812 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1e 3 763786 6262715 1154 }
Source height

{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1f 3 763765 6262613 1154 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1g 3 763783 6262533 1151 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging

{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L1h 3 763874 6262502 1137 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0.0046848 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2a 3 763859 6262307 1126 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2b 3 763839 6262372 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0 0 }

Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2c 3 763881 6262431 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{L2d 3 763892 6262368 1128 }
Source height
{2 0 }
Side length, Effective Radius
{50 2 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability, 5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{3 3 }
Hourly emission rate
{0 0 0 0 0 0 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0.0032232 0 0 }
Deposition fraction proportions
{0.05 0.25 0.7 }
Particle sizes
{2.5 10 30 }
Particle densities
{2.8 2.8 2.8 }
Water scavenging
{0 0 0 }
Ice scavenging
{0 0 0 }

Receptor information

Discrete receptors
Receptor coordinates type (1-Cartesian,0-Polar),Number of Receptors
{1 14 }

X, Y coordinates and Elevation
{765158 6262213 0 }
X, Y coordinates and Elevation
{762633 6263714 0 }
X, Y coordinates and Elevation
{766021 6264384 0 }
X, Y coordinates and Elevation
{764005 6263656 0 }
X, Y coordinates and Elevation
{764244 6263646 0 }
X, Y coordinates and Elevation
{761805 6261925 0 }
X, Y coordinates and Elevation
{761015 6263361 0 }
X, Y coordinates and Elevation
{765425 6263525 0 }
X, Y coordinates and Elevation
{762712 6264351 0 }
X, Y coordinates and Elevation
{764367 6263964 0 }
X, Y coordinates and Elevation
{764234 6263026 0 }
X, Y coordinates and Elevation
{763689 6262943 0 }
X, Y coordinates and Elevation
{765079 6262924 0 }
X, Y coordinates and Elevation
{764247 6262126 0 }

Gridded receptors
Receptor coordinates type (1-Cartesian, 0-Polar), Number of X and Y coordinates, Receptor height
{1 69 58 0 }

X grid coordinates
{760332 760432 760532 760632 760732 760832 760932 761032 761132 761232 761332 761432 761532 761632 761732 761832 761932 762032 762132 762232 762332 762432 762532 762632 762732 762832 762932 763032 763132 763232 763332 763432 763532 763632 763732 763832 763932 764032 764132 764232 764332 764432 764532 764632 764732 764832 764932 765032 765132 765232 765332 765432 765532 765632 765732 765832 765932 766032 766132 766232 766332 766432 766532 766632 766732 766832 766932 767032 767132 }

Y grid coordinates
{6259493 6259593 6259693 6259793 6259893 6259993 6260093 6260193 6260293 6260393 6260493 6260593 6260693 6260793 6260893 6260993 6261093 6261193 6261293 6261393 6261493 6261593 6261693 6261793 6261893 6261993 6262093 6262193 6262293 6262393 6262493 6262593 6262693 6262793 6262893 6262993 6263093 6263193 6263293 6263393 6263493 6263593 6263693 6263793 6263893 6263993 6264093 6264193 6264293 6264393 6264493 6264593 6264693 6264793 6264893 6264993 6265093 6265193 }

Model settings and parameters
Emission conversion factor, Averaging Time
{1000 0 }

Land use (surface roughness)
{0.4}

Averaging time flags (1,2,3,4,6,8,12,24 hrs, 7, 90 days, 3 month, All hrs
{0 0 0 0 0 0 0 0 0 0 0 1 }

Statistical output options
{0 0 }

Output options (All meteodata, Every concentration/deposition, Highest/2nd highest, 100 worst case table, Save all calculations
{0 0 0 1 0 0 }
Write concentration (1-yes, 0-no), Concentration rank, Write frequency, Frequency Level

{1 1 0 -1 }

Disregard exponents (1-yes, 0-no), Exponent Scheme (1-Irvin urban, 2-Irvin rural, 3-ISCST, 4-User Defined
{0 2 }
Dispersion exponents
{0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.2 0.2 0.2 0.2 0.2 0.2 0.25 0.25 0.25 0.25 0.25 0.25 0.4 0.4 0.4 0.4 0.4 0.4 0.6 0.6 0.6 0.6 0.6 0.6 }

Building wake effects (1-include,0-not) , Default decay coefficient, Anemometr height, Sigma-theta averaging period, Roughness at vane site, Smooth stability changes, ConvectivePDF)
{0 0 10 60 0.3 0 0 }

Deposition options, Depletion options
{False False True False False False }

Stability class adjustments (0-None, 1-Urban1, 2-Urban2)
{0}
Building wake algorithms (1-Huber-Sneider, 2-Hybrid, 3-Schulman-Scire)
{4}

Gradual plume rise (1-yes,0-no), Stack tip downwash (1-yes,0-no), Disregard Temperature Gradient (1-yes,0-no), Partial Penetration, Temp Gradient, Adiabatic Entrainment, Stable Entrainment
{1 1 0 0 0.004 0.6 0.6 }
Temperature Gradients for Wind and Stability categories
{0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.02 0.02 0.02 0.02 0.02 0.02 0.035 0.035 0.035 0.035 0.035 0.035 }

Dispersion curves (1-Pasquill Gifford, 2- Briggs rural, 3-Sigma theta) horizontal < 100 m, ditto vertical < 100 m, ditto horizontal > 100 m, ditto vertical > 100 m
{3 1 2 2 }
Adjust PG curves for roughness - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Enhance plume for buyoancy - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Adjust for wind direction shear
{0}
Shear rates
{0.005 0.01 0.015 0.02 0.025 0.035 }

Wind Speed categories
{1.54 3.09 5.14 8.23 10.8 }

Output file
{'N:\1296_Oberon\Air\TSP_dep_V1.txt'}
Meteorological file
{'N:\1296_Oberon\Air\Oberon.met'}
Receptor file
{'N:\1296_Oberon\Air\1296_V1.ter'}
Concentration file
{'N:\1296_Oberon\Air\TSP_dep_V1.dat'}

1 _____

Oberon Quarry - Version 1

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Concentration or deposition	Dry deposition only
Emission load units	grams/second
Deposition units	milligram/m2
Units conversion factor	1.00E+03
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	Yes

Decay coefficient (unless overridden by met. file) 0.000
Anemometer height 10 m
Roughness height at the wind vane site 0.300 m
Averaging time for sigma-theta values 60 min.

DISPERSION CURVES
Horizontal dispersion curves for sources <100m high Sigma-theta
Vertical dispersion curves for sources <100m high Pasquill-Gifford
Horizontal dispersion curves for sources >100m high Briggs Rural
Vertical dispersion curves for sources >100m high Briggs Rural
Enhance horizontal plume spreads for buoyancy? Yes
Enhance vertical plume spreads for buoyancy? Yes
Adjust horizontal P-G formulae for roughness height? Yes
Adjust vertical P-G formulae for roughness height? Yes
Roughness height 0.400m
Adjustment for wind directional shear None

PLUME RISE OPTIONS
Gradual plume rise? Yes
Stack-tip downwash included? Yes
Building downwash algorithm: PRIME method.
Entrainment coeff. for neutral & stable lapse rates 0.60,0.60
Partial penetration of elevated inversions? No
Disregard temp. gradients in the hourly met. file? No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Rural" values (unless overridden by met. file)

AVERAGING TIMES
average over all hours

1

Oberon Quarry - Version 1

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: A1A

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763765	6263022	1154m	198m	181m	20deg	2m	0m

(Constant) emission rate = 1.00E-05 grams/second per square metre

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

INTEGRATED AREA SOURCE: A1B

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763671	6262756	1154m	194m	281m	20deg	2m	0m

(Constant) emission rate = 1.50E-05 grams/second per square metre

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

INTEGRATED AREA SOURCE: A2

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763529	6262621	1154m	115m	176m	20deg	2m	0m

(Constant) emission rate = 6.00E-06 grams/second per square metre

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

INTEGRATED AREA SOURCE: A3

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763574	6262408	1162m	139m	194m	20deg	2m	0m

(Constant) emission rate = 8.00E-06 grams/second per square metre

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

INTEGRATED AREA SOURCE: A1C

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763640	6262590	1154m	160m	169m	20deg	2m	0m

(Constant) emission rate = 8.00E-06 grams/second per square metre

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

INTEGRATED AREA SOURCE: A4

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763801	6262346	1151m	90m	145m	20deg	2m	0m

(Constant) emission rate = 4.00E-06 grams/second per square metre

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

INTEGRATED AREA SOURCE: A5

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
763808	6263195	1154m	217m	78m	20deg	2m	0m

(Constant) emission rate = 5.00E-06 grams/second per square metre

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V1

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763869	6262462	1129m	4m	1m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 6.15E-02
9 6.15E-02	10 6.15E-02	11 6.15E-02	12 6.15E-02
13 6.15E-02	14 6.15E-02	15 6.15E-02	16 6.15E-02
17 6.15E-02	18 6.15E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)

0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V2

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763869	6262446	1128m	3m	1m	3m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 6.48E-01
9 6.48E-01	10 6.48E-01	11 6.48E-01	12 6.48E-01
13 6.48E-01	14 6.48E-01	15 6.48E-01	16 6.48E-01
17 6.48E-01	18 6.48E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V3

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763878	6262444	1128m	6m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 4.93E-02
9 4.93E-02	10 4.93E-02	11 4.93E-02	12 4.93E-02
13 4.93E-02	14 4.93E-02	15 4.93E-02	16 4.93E-02
17 4.93E-02	18 4.93E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V4

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262414	1128m	3m	2m	3m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 2.86E-01
9 2.86E-01	10 2.86E-01	11 2.86E-01	12 2.86E-01
13 2.86E-01	14 2.86E-01	15 2.86E-01	16 2.86E-01
17 2.86E-01	18 2.86E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V5

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763868	6262387	1128m	4m	2m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 6.08E-01
9 6.08E-01	10 6.08E-01	11 6.08E-01	12 6.08E-01
13 6.08E-01	14 6.08E-01	15 6.08E-01	16 6.08E-01
17 6.08E-01	18 6.08E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V6

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763860	6262395	1128m	4m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 4.93E-02
9 4.93E-02	10 4.93E-02	11 4.93E-02	12 4.93E-02
13 4.93E-02	14 4.93E-02	15 4.93E-02	16 4.93E-02
17 4.93E-02	18 4.93E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V7

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262385	1128m	4m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 4.93E-02

9 4.93E-02 10 4.93E-02 11 4.93E-02 12 4.93E-02
13 4.93E-02 14 4.93E-02 15 4.93E-02 16 4.93E-02
17 4.93E-02 18 4.93E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V9

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763853	6262376	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 4.93E-02
9 4.93E-02 10 4.93E-02 11 4.93E-02 12 4.93E-02
13 4.93E-02 14 4.93E-02 15 4.93E-02 16 4.93E-02
17 4.93E-02 18 4.93E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V10

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763856	6262367	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 0.00E+00 8 4.93E-02
9 4.93E-02 10 4.93E-02 11 4.93E-02 12 4.93E-02
13 4.93E-02 14 4.93E-02 15 4.93E-02 16 4.93E-02
17 4.93E-02 18 4.93E-02 19 0.00E+00 20 0.00E+00
21 0.00E+00 22 0.00E+00 23 0.00E+00 24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V11

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763867	6262369	1128m	3m	0m	1m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 4.93E-02
9 4.93E-02	10 4.93E-02	11 4.93E-02	12 4.93E-02
13 4.93E-02	14 4.93E-02	15 4.93E-02	16 4.93E-02
17 4.93E-02	18 4.93E-02	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V8

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763862	6262375	1128m	4m	2m	4m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 0.00E+00	8 6.08E-01
9 6.08E-01	10 6.08E-01	11 6.08E-01	12 6.08E-01
13 6.08E-01	14 6.08E-01	15 6.08E-01	16 6.08E-01
17 6.08E-01	18 6.08E-01	19 0.00E+00	20 0.00E+00
21 0.00E+00	22 0.00E+00	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.3500	10.0	2.80
0.6000	30.0	2.80

VOLUME SOURCE: V12

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763884	6263125	1154m	2m	2m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 5.69E-02	8 5.69E-02
9 5.69E-02	10 5.69E-02	11 5.69E-02	12 5.69E-02
13 5.69E-02	14 5.69E-02	15 5.69E-02	16 5.69E-02
17 5.69E-02	18 5.69E-02	19 5.69E-02	20 5.69E-02
21 5.69E-02	22 5.69E-02	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.4500	10.0	2.80
0.5000	30.0	2.80

VOLUME SOURCE: V13

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763835	6262397	1131m	2m	2m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 5.69E-02	8 5.69E-02
9 5.69E-02	10 5.69E-02	11 5.69E-02	12 5.69E-02
13 5.69E-02	14 5.69E-02	15 5.69E-02	16 5.69E-02
17 5.69E-02	18 5.69E-02	19 5.69E-02	20 5.69E-02
21 5.69E-02	22 5.69E-02	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.4500	10.0	2.80
0.5000	30.0	2.80

VOLUME SOURCE: L1A

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6263110	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L1B

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763865	6263010	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80

0.2500 10.0 2.80
0.7000 30.0 2.80

VOLUME SOURCE: L1C

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763845	6262912	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L1D

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763810	6262812	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L1E

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763786	6262715	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

Particle Particle Particle

Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L1F

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763765	6262613	1154m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L1G

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763783	6262533	1151m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03
17 4.68E-03	18 4.68E-03	19 4.68E-03	20 4.68E-03
21 4.68E-03	22 4.68E-03	23 0.00E+00	24 0.00E+00

Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L1H

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763874	6262502	1137m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00	2 0.00E+00	3 0.00E+00	4 0.00E+00
5 0.00E+00	6 0.00E+00	7 4.68E-03	8 4.68E-03
9 4.68E-03	10 4.68E-03	11 4.68E-03	12 4.68E-03
13 4.68E-03	14 4.68E-03	15 4.68E-03	16 4.68E-03

17 4.68E-03 18 4.68E-03 19 4.68E-03 20 4.68E-03
21 4.68E-03 22 4.68E-03 23 0.00E+00 24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L2A

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763859	6262307	1126m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 3.22E-03 8 3.22E-03
9 3.22E-03 10 3.22E-03 11 3.22E-03 12 3.22E-03
13 3.22E-03 14 3.22E-03 15 3.22E-03 16 3.22E-03
17 3.22E-03 18 3.22E-03 19 3.22E-03 20 3.22E-03
21 3.22E-03 22 3.22E-03 23 0.00E+00 24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L2B

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763839	6262372	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 3.22E-03 8 3.22E-03
9 3.22E-03 10 3.22E-03 11 3.22E-03 12 3.22E-03
13 3.22E-03 14 3.22E-03 15 3.22E-03 16 3.22E-03
17 3.22E-03 18 3.22E-03 19 3.22E-03 20 3.22E-03
21 3.22E-03 22 3.22E-03 23 0.00E+00 24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L2C

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763881	6262431	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:

1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 3.22E-03 8 3.22E-03
9 3.22E-03 10 3.22E-03 11 3.22E-03 12 3.22E-03
13 3.22E-03 14 3.22E-03 15 3.22E-03 16 3.22E-03
17 3.22E-03 18 3.22E-03 19 3.22E-03 20 3.22E-03
21 3.22E-03 22 3.22E-03 23 0.00E+00 24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

VOLUME SOURCE: L2D

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
763892	6262368	1128m	2m	50m	2m

Emission rates by hour of day in grams/second:
1 0.00E+00 2 0.00E+00 3 0.00E+00 4 0.00E+00
5 0.00E+00 6 0.00E+00 7 3.22E-03 8 3.22E-03
9 3.22E-03 10 3.22E-03 11 3.22E-03 12 3.22E-03
13 3.22E-03 14 3.22E-03 15 3.22E-03 16 3.22E-03
17 3.22E-03 18 3.22E-03 19 3.22E-03 20 3.22E-03
21 3.22E-03 22 3.22E-03 23 0.00E+00 24 0.00E+00

Particle Mass fraction	Particle Size (micron)	Particle Density (g/cm3)
0.0500	2.5	2.80
0.2500	10.0	2.80
0.7000	30.0	2.80

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Oberon Quarry - Version 1

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):
760332.m 760432.m 760532.m 760632.m 760732.m 760832.m 760932.m
761032.m 761132.m 761232.m 761332.m 761432.m 761532.m 761632.m
761732.m 761832.m 761932.m 762032.m 762132.m 762232.m 762332.m
762432.m 762532.m 762632.m 762732.m 762832.m 762932.m 763032.m
763132.m 763232.m 763332.m 763432.m 763532.m 763632.m 763732.m
763832.m 763932.m 764032.m 764132.m 764232.m 764332.m 764432.m
764532.m 764632.m 764732.m 764832.m 764932.m 765032.m 765132.m
765232.m 765332.m 765432.m 765532.m 765632.m 765732.m 765832.m
765932.m 766032.m 766132.m 766232.m 766332.m 766432.m 766532.m
766632.m 766732.m 766832.m 766932.m 767032.m 767132.m

and these y-values (or northings):
6259493.m 6259593.m 6259693.m 6259793.m 6259893.m 6259993.m 6260093.m
6260193.m 6260293.m 6260393.m 6260493.m 6260593.m 6260693.m 6260793.m

6260893.m 6260993.m 6261093.m 6261193.m 6261293.m 6261393.m 6261493.m
6261593.m 6261693.m 6261793.m 6261893.m 6261993.m 6262093.m 6262193.m
6262293.m 6262393.m 6262493.m 6262593.m 6262693.m 6262793.m 6262893.m
6262993.m 6263093.m 6263193.m 6263293.m 6263393.m 6263493.m 6263593.m
6263693.m 6263793.m 6263893.m 6263993.m 6264093.m 6264193.m 6264293.m
6264393.m 6264493.m 6264593.m 6264693.m 6264793.m 6264893.m 6264993.m
6265093.m 6265193.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	765158	6262213	1194	0.0	9	765425	6263525	1119	0.0
2	762633	6263714	1079	0.0	10	762712	6264351	1082	0.0
3	764396	6263293	1094	0.0	11	764367	6263964	1122	0.0
4	766021	6264384	1141	0.0	12	764234	6263026	1110	0.0
5	764005	6263656	1140	0.0	13	763689	6262943	1164	0.0
6	764244	6263646	1137	0.0	14	765079	6262924	1113	0.0
7	761805	6261925	1098	0.0	15	764247	6262126	1101	0.0
8	761015	6263361	1097	0.0					

METEOROLOGICAL DATA : TAPM Generated Data for Oberon Sydney Uair Z0-0.3 A
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AVERAGE OVER ALL HOURS AND FOR ALL SOURCES
in milligram/m2

Concentrations at the discrete receptors (No. : Value):

1:7.36E+03 2:5.06E+03 3:2.43E+04 4:3.25E+03 5:8.92E+03 6:1.05E+04 7:3.25E+03 8:4.16E+03
9:7.02E+03 10:2.15E+03 11:5.58E+03 12:4.77E+04 13:1.66E+05 14:1.10E+04 15:2.30E+04

APPENDIX 6

Traffic Survey Results

Appendix 6 – Traffic Survey

Shooters Hill Road		Right Turn			Left Turn		
Date	**Time**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**
02/12/2014	7.00	2	5	7	5	8	13
	8.00	1	3	4	12	7	19
	9.00	0	1	1	3	7	10
	10.00	0	5	5	3	12	15
	11.00	0	2	2	4	8	12
	12.00	0	4	4	6	5	11
	13.00	1	3	4	9	8	17
	14.00	0	0	0	4	6	10
	15.00	0	3	3	18	6	24
	16.00			0			0
	17.00			0			
	Total	4	26	30	64	67	131
						Trucks %	**58%**
03/12/2014	7.00	0	3	3	7	7	14
	8.00	0	4	4	5	6	11
	9.00	0	4	4	6	6	12
	10.00	0	1	1	6	8	14
	11.00	3	5	8	2	6	8
	12.00	0	1	1	3	5	8
	13.00	1	2	3	4	10	14
	14.00	4	5	9	6	10	16
	15.00	1	2	3	6	2	8
	16.00	0	1	1	6	0	6
	17.00	0		0			
	Total	9	28	37	51	60	111
						% Trucks	**59%**

Edith Road		North Bound						South Bound					
		Left Turn			Straight Ahead			Right Turn			Straight Ahead		
Date	**Time**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**
02/12/2014	7.00	0	5	5	29	3	32	9	7	16	14	1	15
	8.00	0	3	3	25	1	26	5	8	13	17	2	19
	9.00	0	1	1	13	2	15	4	6	10	12	2	14
	10.00	5	4	9	14	0	14	5	12	17	9	3	12
	11.00	0	3	3	10	0	10	5	8	13	9	3	12
	12.00	0	0	0	18	0	18	10	5	15	11	3	14
	13.00	0	3	3	16	0	16	6	9	15	17	0	17
	14.00	0	1	1	5	1	6	4	3	7	4	4	8
	15.00	0	0	0	17	0	17	7	8	15	15	1	16
	16.00	0	0	0	17	0	17			0	15		15
	17.00			0									
	Total	5	20	25	164	7	171	55	66	121	123	19	142
												% Trucks	**24%**
		Right Turn			**Straight Ahead**			**Left Turn**			**Straight Ahead**		
Date	**Time**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**
03/12/2014	7.00	0	2	2	19	4	23	9	12	21	19	1	20
	8.00	2	6	8	15	3	18	0	7	7	4	0	4
	9.00	1	3	4	11	1	12	8	6	14	11	2	13
	10.00	0	2	2	7	1	8	2	9	11	12	0	12
	11.00	0	2	2	7	5	12	4	10	14	10	2	12
	12.00	0	4	4	7	0	7	7	1	8	13	0	13
	13.00	0	6	6	14	5	19	2	10	12	5	1	6
	14.0	0	0	0	10	0	10	10	10	20	15	1	16
	15.00	1	1	2	9	3	12	2	2	4	3	1	4
	16.00	2	3	5	11	2	13	7	1	8	14		14
	17.00			0									
	Total	6	29	35	110	24	134	51	68	119	106	8	114
												% Trucks	**32%**

Duckmaloi Road		Eastbound						Westbound					
		Right Turn			Straight Ahead			Left Turn			Straight Ahead		
Date	**Time**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**
02/12/2014	7.00	7	4	11	26	6	32	3	1	4	18	4	22
	8.00	8	2	10	21	5	26	7	1	8	22	7	29
	9.00	6	2	8	32	3	35	0	1	1	19	6	25
	10.00	14	4	18	10	6	16	8	5	13	18	13	31
	11.00	9	2	11	13	5	18	3	0	3	21	8	29
	12.00	7	2	9	24	9	33	4	0	4	18	11	29
	13.00	16	3	19	25	4	29	0	1	1	17	8	25
	14.0	11	3	14	17	2	19	4	1	5	22	4	26
	15.00	17	1	18	26	6	32	5	2	7	21	6	27
	16.00	16	1	17	18	2	20	5	1	6	25	2	27
	17.00			0									
	Total	111	24	135	212	48	260	39	13	52	201	69	270
												% Trucks	**21%**
03/12/2014	7.00	10	1	11	33	5	38	1	1	2	20	3	23
	8.00	11	3	14	20	6	26	3	3	6	21	2	23
	9.00	7	1	8	13	9	22	1	1	2	24	6	30
	10.00	8	4	12	22	2	24	4	1	5	15	7	22
	11.00	11	1	12	22	4	26	4	2	6	16	3	19
	12.00	13	5	18	19	7	26	3	0	3	21	6	27
	13.00	6	4	10	27	10	37	7	2	9	20	8	28
	14.0	14	2	16	24	9	33	7	1	8	27	9	36
	15.00	22	2	24	20	4	24	3	4	7	14	7	21
	16.00	21	0	21	23	1	24	1	0	1	31	6	37
	17.00			0									
	Total	123	23	146	223	57	280	34	15	49	209	57	266
												% Trucks	**21%**

Titania Road		Right Turn			Left Turn		
Date	**Time**	**Cars**	**Trucks**	**Total**	**Cars**	**Trucks**	**Total**
02/12/2014	7.00		2	2	24	5	29
	8.00	4	3	7	26	2	28
	9.00	1	0	1	12	5	17
	10.00	2	0	2	14	2	16
	11.00	1	3	4	4	6	10
	12.00	8	3	11	9	3	12
	13.00	5	0	5	6	4	10
	14.00	2	1	3	13	2	15
	15.00	1	4	5	13	4	17
	16.00	4	4	8	13	1	14
	17.00			0			
	Total	28	20	48	134	34	168
						Trucks %	**25%**
03/12/2014	7.00	8	1	9	22	1	23
	8.00	6	2	8	29	1	30
	9.00	4	2	6	10	7	17
	10.00	1	1	2	8	3	11
	11.00	1	2	3	8	4	12
	12.00	3	1	4	6	4	10
	13.00	3	1	4	11	1	12
	14.00	4	3	7	13	2	15
	15.00	1	6	7	13	5	18
	16.00	5	3	8	8	2	10
	17.00		0	0		0	
	Total	36	22	58	128	30	158
						% Trucks	**24%**

Intersection Volume Count

Cars = passenger cars, stationwagons, motorcycles and pick-up trucks

Trucks = other trucks and buses (Record school buses with SB)

Date: 2/12/14
Time: 7.00am to 5.00 pm
Weather: Fine
Observer:
N/S Street:
E/W Street:
Intersection Control:

Titania Road

	Cars	Trucks
7.00		2
8.00	4	3
9.00	1	0
10.00	2	0
11.00	1	3
12.00	8	3
13.00	5	0
14.00	2	1
15.00	1	4 (SB)
16.00	4	4
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	24	5
8.00	26	2 (SB)
9.00	12	5
10.00	14	2
11.00	4	6
12.00	9	3
13.00	6	4
14.00	13	2
15.00	13	4
16.00	13	SB
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	3	1
8.00	7	1 SB
9.00	0	1
10.00	8	5
11.00	3	0
12.00	4	0
13.00	0	1
14.00	4	1
15.00	5	2
16.00	5	
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	7	4
8.00	8	2
9.00	6	2
10.00	14	4
11.00	9	2
12.00	7	2
13.00	16	3
14.00	11	3
15.00	17	1 SB
16.00	16	1
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	18	4
8.00	22	7
9.00	19	6
10.00	18	13
11.00	21	8
12.00	18	11 SB
13.00	17	8
14.00	22	4 (SB)(SB)
15.00	21	6
16.00	25	2 (SB)
17.00		
18.00		
19.00		
20.00		

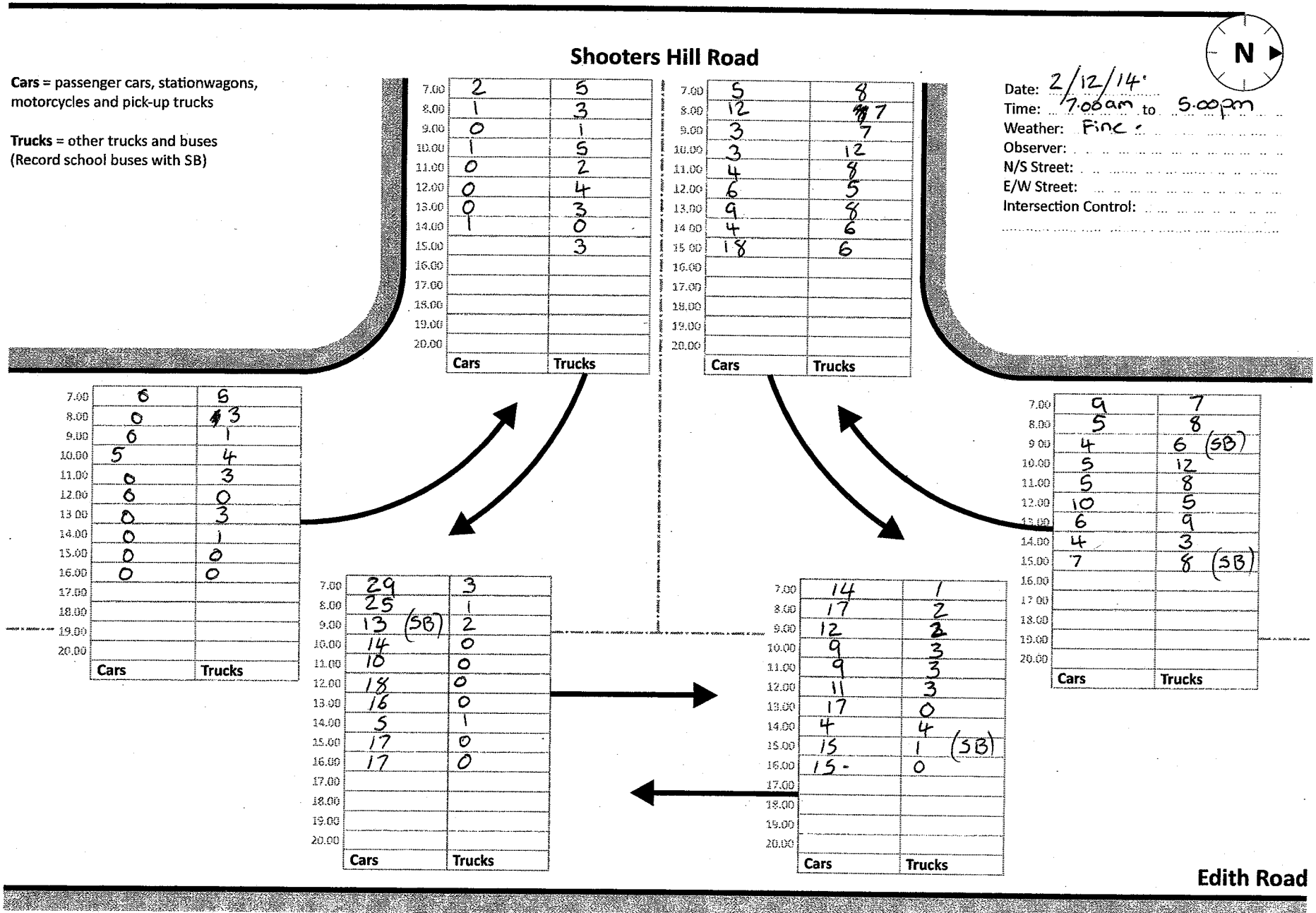
	Cars	Trucks
7.00	26	6 (SB)
8.00	21	5
9.00	32	3
10.00	10	6
11.00	13	5
12.00	24	9
13.00	25	4
14.00	17	2 (SB)
15.00	26	6
16.00	18	2
17.00		
18.00		
19.00		
20.00		

Duckmaloi Road

Intersection Volume Count

Cars = passenger cars, stationwagons, motorcycles and pick-up trucks

Trucks = other trucks and buses (Record school buses with SB)



	Cars	Trucks
7.00	2	5
8.00	1	3
9.00	0	1
10.00	1	5
11.00	0	2
12.00	0	4
13.00	0	3
14.00	1	0
15.00		3
16.00		
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	5	8
8.00	12	7
9.00	3	7
10.00	3	12
11.00	4	8
12.00	6	5
13.00	9	8
14.00	4	6
15.00	18	6
16.00		
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	6	6
8.00	0	3
9.00	6	1
10.00	5	4
11.00	0	3
12.00	6	0
13.00	0	3
14.00	0	1
15.00	0	0
16.00	0	0
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	9	7
8.00	5	8
9.00	4	6 (SB)
10.00	5	12
11.00	5	8
12.00	10	5
13.00	6	9
14.00	4	3
15.00	7	8 (SB)
16.00		
17.00		
18.00		
19.00		
20.00		

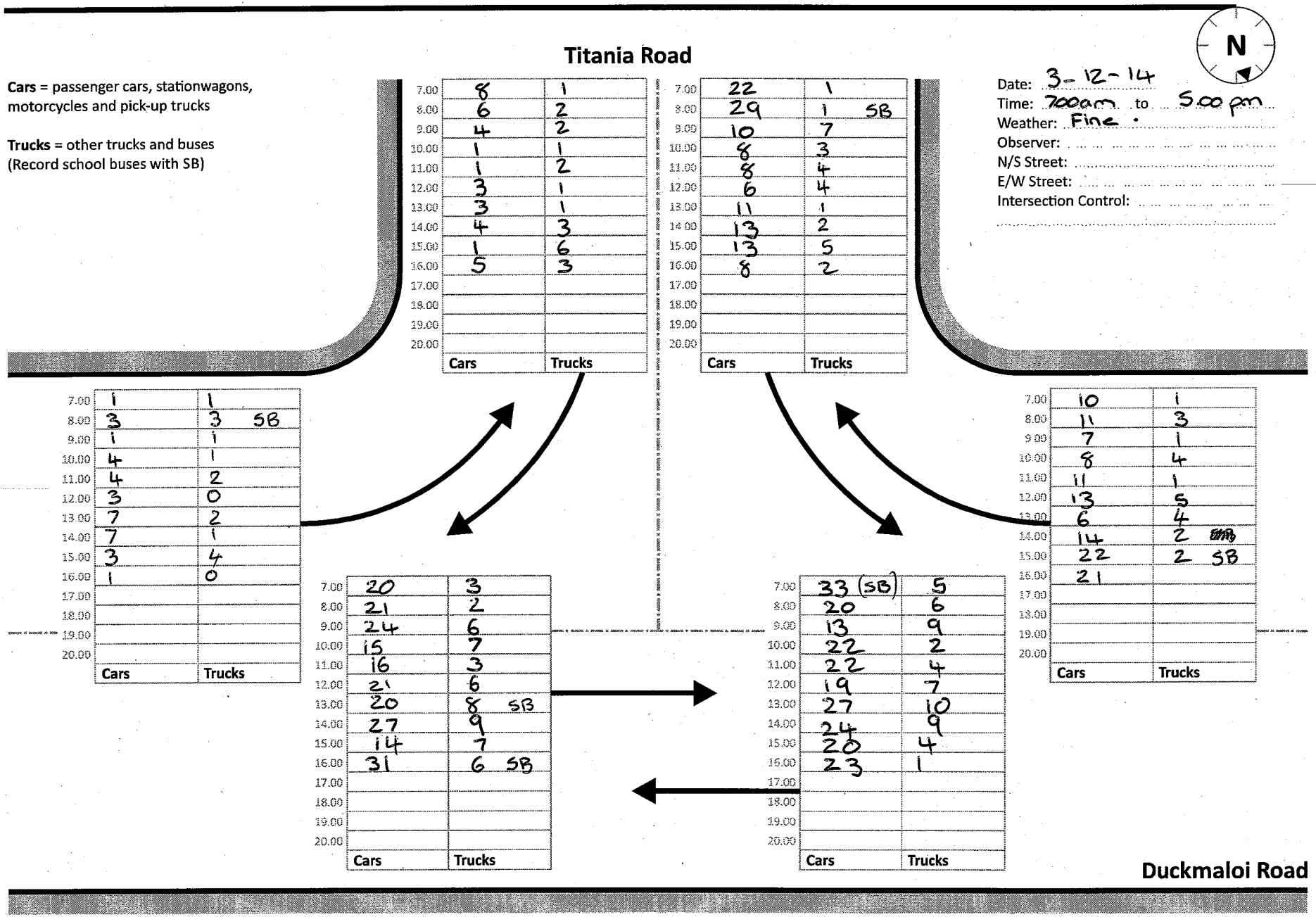
	Cars	Trucks
7.00	29	3
8.00	25	1
9.00	13 (SB)	2
10.00	14	0
11.00	10	0
12.00	18	0
13.00	16	0
14.00	5	1
15.00	17	0
16.00	17	0
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	14	1
8.00	17	2
9.00	12	2
10.00	9	3
11.00	9	3
12.00	11	3
13.00	17	0
14.00	4	4
15.00	15	1 (SB)
16.00	15	0
17.00		
18.00		
19.00		
20.00		

Intersection Volume Count

Cars = passenger cars, stationwagons, motorcycles and pick-up trucks

Trucks = other trucks and buses (Record school buses with SB)



	Cars	Trucks
7.00	8	1
8.00	6	2
9.00	4	2
10.00	1	1
11.00	1	2
12.00	3	1
13.00	3	1
14.00	4	3
15.00	1	6
16.00	5	3
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	22	1
8.00	29	1 SB
9.00	10	7
10.00	8	3
11.00	8	4
12.00	6	4
13.00	11	1
14.00	13	2
15.00	13	5
16.00	8	2
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	1	1
8.00	3	3 SB
9.00	1	1
10.00	4	1
11.00	4	2
12.00	3	0
13.00	7	2
14.00	7	1
15.00	3	4
16.00	1	0
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	10	1
8.00	11	3
9.00	7	1
10.00	8	4
11.00	11	1
12.00	13	5
13.00	6	4
14.00	14	2 EMS
15.00	22	2 SB
16.00	21	
17.00		
18.00		
19.00		
20.00		

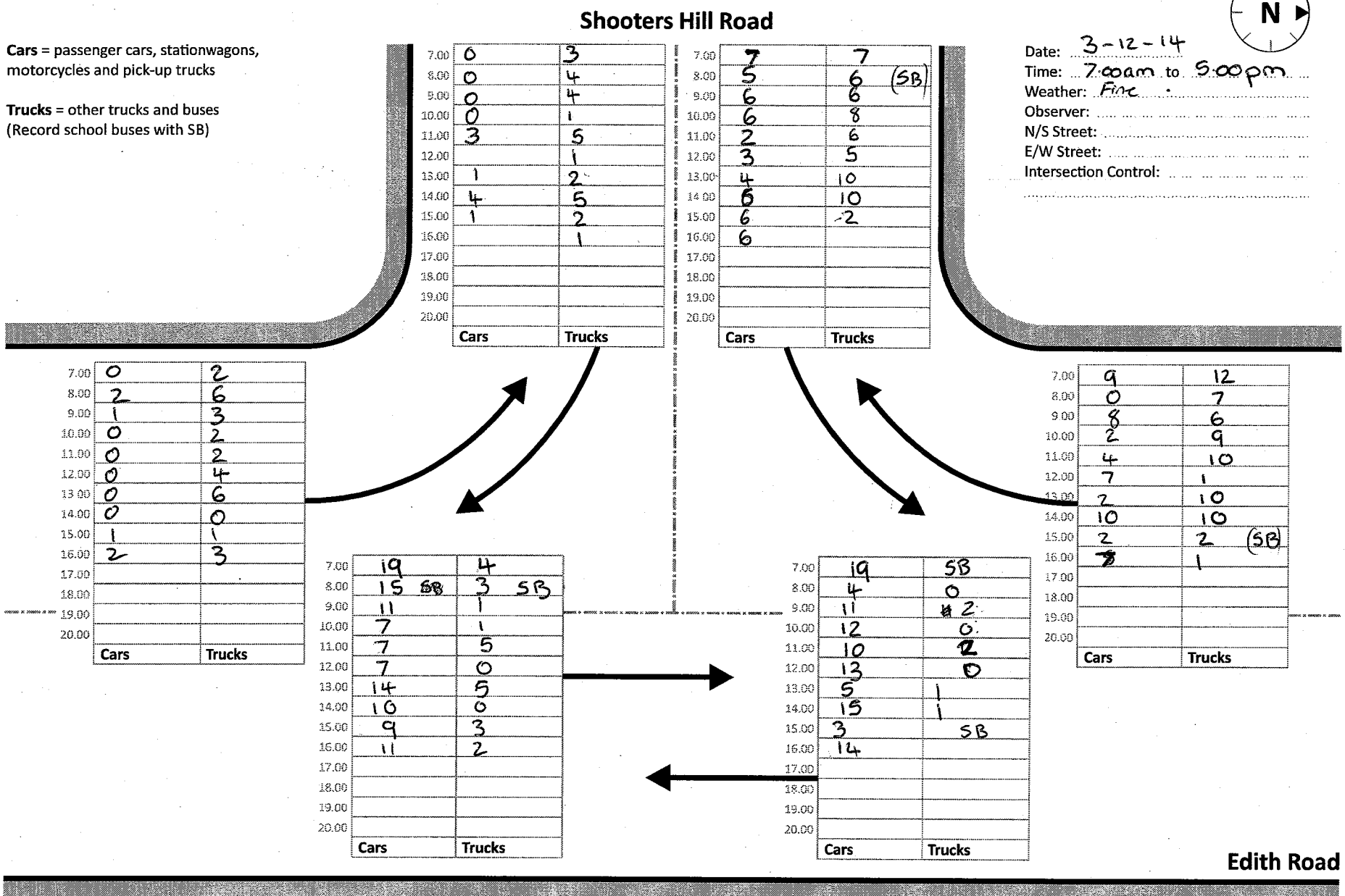
	Cars	Trucks
7.00	20	3
8.00	21	2
9.00	24	6
10.00	15	7
11.00	16	3
12.00	21	6
13.00	20	8 SB
14.00	27	9
15.00	14	7
16.00	31	6 SB
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	33 (SB)	5
8.00	20	6
9.00	13	9
10.00	22	2
11.00	22	4
12.00	19	7
13.00	27	10
14.00	24	9
15.00	20	4
16.00	23	1
17.00		
18.00		
19.00		
20.00		

Intersection Volume Count

Cars = passenger cars, stationwagons, motorcycles and pick-up trucks

Trucks = other trucks and buses (Record school buses with SB)



	Cars	Trucks
7.00	0	3
8.00	0	4
9.00	0	4
10.00	0	1
11.00	3	5
12.00		1
13.00	1	2
14.00	4	5
15.00	1	2
16.00		1
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	7	7
8.00	5	6 (SB)
9.00	6	6
10.00	6	8
11.00	2	6
12.00	3	5
13.00	4	10
14.00	6	10
15.00	6	2
16.00	6	
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	0	2
8.00	2	6
9.00	1	3
10.00	0	2
11.00	0	2
12.00	0	4
13.00	0	6
14.00	0	0
15.00	1	1
16.00	2	3
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	9	12
8.00	0	7
9.00	8	6
10.00	2	9
11.00	4	10
12.00	7	1
13.00	2	10
14.00	10	10
15.00	2	2 (SB)
16.00	3	1
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	19	4
8.00	15 SB	3 SB
9.00	11	1
10.00	7	1
11.00	7	5
12.00	7	0
13.00	14	5
14.00	10	0
15.00	9	3
16.00	11	2
17.00		
18.00		
19.00		
20.00		

	Cars	Trucks
7.00	19	SB
8.00	4	0
9.00	11	2
10.00	12	0
11.00	10	2
12.00	13	0
13.00	5	1
14.00	15	1
15.00	3	SB
16.00	14	
17.00		
18.00		
19.00		
20.00		

APPENDIX 7

Record of Aboriginal Party Consultation

umwelt

Our Ref: PJ/PJ/SH/040913

04 September 2013

posted 4/09/13

Sharyn Halls
Secretary
Gundungurra Aboriginal Heritage Association Inc.
PO Box 31
LAWSON NSW 2783

Dear Sharyn

Re: Aboriginal Cultural Values and the Oberon Quarries proposed extension

Oberon Quarries Pty Limited (Oberon Quarries) has an existing quarry with a current approval (DA 92/164) at Racecourse Hill, Oberon NSW. Oberon Quarries is seeking to extend the approved quarry extraction area to include a 1 hectare extension area (refer to **Figure 1** and **Plate 1**). This 1 hectare area is within the project footprint that was considered as part of the Environmental Impact Statement in 1992 (Resource Planning 1992). No Aboriginal artefacts were identified in the area at the time and it was observed that the area had been previously highly disturbed with native vegetation being replaced with improved pasture and a non-native windbreak.

From an archaeological perspective, the area will be assessed following the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010). However, any Aboriginal cultural values associated with the area will also be considered as part of the modification. As such, we would be grateful if Gundungurra Aboriginal Heritage Association Inc. could provide any relevant information regarding any known Aboriginal cultural values of the Racecourse Hill area to be included in the assessment for the proposed extension.

Any information you would like included in the assessment can be provided in writing to:

Jan Wilson
Umwelt (Australia) Pty Limited
75 York St
TERALBA NSW 2284

jwilson@umwelt.com.au
Fax: 02 4950 5737

It would be appreciated if Umwelt could have your reply by 2 October 2013. If you require any further information please do not hesitate to contact me on (02) 4950 5322 or on 0427 528 622 or via email jwilson@umwelt.com.au.

Yours sincerely

J. Wilson

Jan Wilson
Manager, Cultural Heritage

Newcastle
75 York Street
Teralba NSW 2284
Ph. 02 4950 5322
Perth
PO Box 8177
Subiaco East WA 6008
33 Ventnor Avenue
West Perth WA 6005
Ph. 08 6260 0700
Canberra
PO Box 6135
56 Bluebell Street
O'Connor ACT 2602
Ph. 02 6262 9484
www.umwelt.com.au

umwelt

Inspired People.
Dedicated Team.
Quality Outcomes.

posted 4/09/13

Our Ref: 1296/PJ/PJ/SH/040913

04 September 2013

Sharon Brown
Chairperson
Gundungurra Tribal Council Aboriginal Corporation
14 Oak Street
KATOOMBA NSW 2780

Dear Sharon

Re: Aboriginal Cultural Values and the Oberon Quarries proposed extension

Oberon Quarries Pty Limited (Oberon Quarries) has an existing quarry with a current approval (DA 92/164) at Racecourse Hill, Oberon NSW. Oberon Quarries is seeking to extend the approved quarry extraction area to include a 1 hectare extension area (refer to **Figure 1** and **Plate 1**). This 1 hectare area is within the project footprint that was considered as part of the Environmental Impact Statement in 1992 (Resource Planning 1992). No Aboriginal artefacts were identified in the area at the time and it was observed that the area had been previously highly disturbed with native vegetation being replaced with improved pasture and a non-native windbreak.

From an archaeological perspective, the area will be assessed following the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010). However, any Aboriginal cultural values associated with the area will also be considered as part of the modification. As such, we would be grateful if Gundungurra Tribal Council Aboriginal Corporation could provide any relevant information regarding any known Aboriginal cultural values of the Racecourse Hill area to be included in the assessment for the proposed extension.

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Jan Wilson
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Yours sincerely

Jan Wilson
Manager, Cultural Heritage

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Ph. 02 4950 5322

Perth
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33 Ventnor Avenue
West Perth WA 6005
Ph. 08 6260 0700

Canberra
PO Box 6135
56 Bluebell Street
O'Connor ACT 2602
Ph. 02 6262 9484

www.umwelt.com.au

APPENDIX 8

AHIMS Search Results

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : Oberon

Client Service ID : 121357

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
44-6-0055	The Reef;	AGD	55	765200	6262300	Open site	Valid	Artefact : -	Isolated Find	
	Contact	**Recorders**	P Ferry					**Permits**		
44-6-0059	Racecourse Ck2;	AGD	55	764250	6262370	Open site	Valid	Artefact : -	Open Camp Site	2580
	Contact	**Recorders**	Mr.Matthew Barber					**Permits**		
44-6-0060	Racecourse 3;	AGD	55	763930	6263100	Open site	Valid	Artefact : -	Open Camp Site	2580
	Contact	**Recorders**	Mr.Matthew Barber					**Permits**		
44-6-0061	Racecourse Ck 1;	AGD	55	764310	6262370	Open site	Valid	Artefact : -	Open Camp Site	2580
	Contact	**Recorders**	Mr.Matthew Barber					**Permits**		

Report generated by AHIMS Web Service on 08/01/2014 for Nicola Roche for the following area at Lat, Long From : -33.7717, 149.8159 - Lat, Long To : -33.731, 149.8803 with a Buffer of 50 meters. Additional Info : Due diligence report. Number of Aboriginal sites and Aboriginal objects found is 4

APPENDIX 9

Greenhouse Gas and Energy
Calculation Spreadsheet

APPENDIX 9

GHG Calculations – 2012 Operations (192,127 tonnes)

Stationary Diesel Use

Activity Data	Energy Use		Emission Factors		
			CO_2	**CH_4**	**N_20**
kL	GJ/kL	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
240.348	38.6	9,277.43	69.2	0.1	0.2
			t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)			642	0.93	1.86
Total GHG emissions (t CO_2-e)					**644.79**

Electricity Use

Activity Data	Energy Use	Emission Factors		
		CO_2	**CH_4**	**N_20**
GJ	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
1,709.68	1,709.68	245	N/A	N/A
		t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)		418.87	N/A	N/A
Total GHG emissions (t CO_2-e)				**418.87**

Extraction, Production and Distribution of Energy Purchased

Activity Data		Emission Factors		
		CO_2	**CH_4**	**N_20**
Purchased energy	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
Stationary Diesel	9,277.43	5.3	N/A	N/A
Transport Diesel	18,874.04	5.3	N/A	N/A
Electricity	1,709.68	49.0	N/A	N/A
		t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)		232.97	N/A	N/A
Total GHG emissions (t CO_2-e)				**232.97**

Product Transport

Activity Data						Emission Factors		
						CO_2	**CH_4**	**N_20**
Destination	Product (t)	Return Distance (km)	Distance Travelled (km)	Diesel Use (l/Km)	Diesel Use (GJ)	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
Oberon	29,917	8	7,252.50	0.546	152.85	69.2	0.2	0.5
Bathurst	56,791	100	172,092.85	0.546	3,626.96	69.2	0.2	0.5
Blue Mountains	12,901	180	70,370.78	0.546	1,483.11	69.2	0.2	0.5
Western Sydney	57,917	270	473,869.31	0.546	9,987.08	69.2	0.2	0.5
Other	34,601	164	171,954.60	0.546	3,624.05	69.2	0.2	0.5
Total	192,127		895,540.04		18,874.05	t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)						1,306.08	3.77	9.44
Total GHG emissions (t CO_2-e)								**1,319.29**

Transport of Materials (Diesel)

Activity Data						Emission Factors		
						Scope 1	**Scope 3**	**Full Life Cycle**
Destination	Product (t)	Return Distance (km)	Distance Travelled (km)	Diesel Use (l/Km)	Diesel Use (GJ)	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
Oakville - Oberon	729.31	300	6,630	0.546	139.73	69.9	5.3	75.2
						t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)						N/A	N/A	10.51
Total GHG emissions (t CO_2-e)								**10.51**

GHG Calculations – Operations at 400,000 tpa

Stationary Diesel Use

Activity Data		Energy Use	Emission Factors		
			CO_2	CH_4	N_20
kL	GJ/kL	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
400	38.6	15,440	69.2	0.1	0.2
			t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)			1,068.45	1.54	3.01
Total GHG emissions (t CO_2-e)					**1,073**

Electricity Use

Activity Data	Energy Use	Emission Factors		
		CO_2	CH_4	N_20
GJ	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
2,847.58	2,847.58	241	N/A	N/A
		t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)		686.26	N/A	N/A
Total GHG emissions (t CO_2-e)				**686.26**

Extraction, Production and Distribution of Energy Purchased

Activity Data		Emission Factors		
		CO_2	CH_4	N_20
Purchased energy	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
Stationary Diesel	15,440	5.3	N/A	N/A
Transport Diesel	39,295	5.3	N/A	N/A
Electricity	2,847.58	52.0	N/A	N/A
		t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)		438.17	N/A	N/A
Total GHG emissions (t CO_2-e)				**438.17**

Product Transport

Activity Data						Emission Factors		
						CO_2	**CH_4**	**N_20**
Destination	Product (t)	Return Distance (km)	Distance Travelled (km)	Diesel Use (l/Km)	Diesel Use (GJ)	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
Oberon	62,286	8	15,099.64	0.546	318.23	69.2	0.2	0.5
Bathurst	118,236	100	358,290.91	0.546	7,551.20	69.2	0.2	0.5
Blue Mountains	26,859	180	146,503.64	0.546	3,087.65	69.2	0.2	0.5
Western Sydney	120,581	270	986,571.82	0.546	20,792.59	69.2	0.2	0.5
Other	72,038	164	358,007.03	0.546	7,545.21	69.2	0.2	0.5
Total	400,000		1,864,476.03		39,294.89	t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)						2,719.21	7.85	19.64
Total GHG emissions (t CO_2-e)								**2746.71**

Transport of Materials (Diesel)

Activity Data						Emission Factors		
						Scope 1	**Scope 3**	**Full Life Cycle**
Destination	Product (t)	Return Distance (km)	Distance Travelled (km)	Diesel Use (l/Km)	Diesel Use (GJ)	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
Oakville – Oberon	1,804	300	16,400	0.546	345.64	69.9	5.3	75.2
						t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)						N/A	N/A	25.99
Total GHG emissions (t CO_2-e)								**25.99**

Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

www.umwelt.com.au