Technical report A

Air quality and odour impact assessment

AIR QUALITY AND ODOUR IMPACT ASSESSMENT

WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE (WSERRC)

Cleanaway and Macquarie Capital

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EXECUTIVE SUMMARY

Cleanaway and Macquarie Capital (together the Consortium) (the proponent) propose to construct and operate the Western Sydney Energy Resource Recovery Centre (WSERRC), an energy-from-waste facility located at 339 Wallgrove Road, Eastern Creek.

The operation of the facility involves thermal processing of residual municipal solid waste and residual commercial and industrial waste material at a nominal capacity of 500,000 tonnes per annum to generate up to 58 megawatts (MW) of power of base load electricity, up to 55MW of which is exported to the grid. The facility will consist of two separate, identical lines including a grate, boiler, flue-gas treatment (including an individual flue for each line within a common stack structure) with a common waste receival hall and steam turbine to generate electricity. The facility is designed to be able to operate efficiently across a range of load points varying around the design point (LP1) according to the quantity of residual waste and the energy content of the incoming residual waste fuel. Air emissions and impacts from the operation at every load point (LP), LP1 to LP9 are accounted for in the modelling assessment.

This assessment considered five key scenarios to assess potential air quality impacts associated with the facility. The scenarios assume both lines operate all of the time (8760 hours), and are as follows:

- Scenario 1- Represents the maximum annual average regulatory limit emissions to be released from the stack (comprising two flues) at the design point operating conditions (LP1). The scenario evaluates annual average impacts.

- Scenario 2 - Represents the maximum 24-hour average regulatory limit emissions to be released from the stack (comprising two flues) at the design point operating conditions (LP1), and at the most impacting load point operational condition at any location, in any hour of the year. The scenario evaluates the expected maximum 24-hour average impacts and is consistent with the upper range of the best practice achievable emission limits (BAT-AELs).

- Scenario 3 - Represents the maximum 1-hour average regulatory limit emissions to be released from the stack (comprising two flues) at the design point operating conditions (LP1), and at the most impacting load point condition at any location, in any hour of the year. The scenario models the maximum 1-hour emissions under the worst case operating load and air dispersion conditions to quantify the maximum short term 1-hour and 24-hour average impacts.

- Scenario 4 - The scenario evaluates worst case upset conditions and the upper range of potential impacts at the proposed licence limits, at the most impacting load point condition at any location, in any hour of the year. The scenario conservatively assumes maximum hourly emissions are generated for 24-hours.

An additional scenario (EPA Limit modelling scenario) was also modelled. The scenario conservatively assumes maximum regulatory limit hourly emissions at all hours of the year to be released from the stack (comprising two flues) at the design point operating conditions (LP1). It is noted that this scenario cannot actually occur, and has been modelled to conservatively estimate hypothetical maximum impacts for a regulatory limit scenario.

Table E-1 below presents a summary of the modelled scenarios. The LP1 case represents the stack discharge condition expected for the great majority of the time. The LPmax case takes the highest impacting result of any LP1 to LP9 case in each hour modelled at each point assessed. In essence it represents the hypothetical most impacting possible means of running the plant in every hour of the year at every location.

Table E-1: Modelling scenarios

Scenario	1-hr		24-hr		AA	
	LP1	Max LP	LP1	Max LP	LP1	Max LP
SC1 - Regulatory Limit AA					✓	
SC2 - Regulatory Limit 24-hr			✓	✓		
SC3 - Regulatory Limit 1-hr	✓	✓				
SC4 - Worst-case upset		✓		✓*		
EPA Limit - Regulatory 1-hour limits, all hours of the year	✓		✓*		✓*	

* assumes maximum hourly emissions are generated every hour for 24-hours, or all hours of the year

Start-up, shutdown and potential upset, trip or emergency shutdown conditions are managed via the modern design of the plant, which incorporates fail-safe/ redundant plant and systems to allow start-ups and shutdowns (which may for example trip under upset or emergency conditions) to be completed without adverse emissions arising. Start-up/shut-down conditions have been assessed in terms of the emissions generated from start-up/shut-down procedures compared to those from the design point operation of the proposal (assuming LP1 conditions 100% of the time). Upset conditions have been represented in Scenario 4 by modelling the most elevated short term emissions per the most impacting operational load point in each hour of the year, and also assuming this continues each hour for up to 24-hours before any shutdown is initiated.

Air dispersion modelling was conducted using the CALPUFF modelling suite in conjunction with estimated emission rates for the air pollutants generated by the facility. The modelled air emissions from the proposed plant are based on consideration of the designers' expected regulatory limit emissions, reference to approximately two years of recent data measured at a similar reference facility in Dublin, Ireland, and the emission limits (and where applicable, emission limit range) for waste incineration set in the *Commission Implementing Decision (EU) 2019/2010 Of 12 November 2019 Establishing The Best Available Techniques (BAT) Conclusions, Under Directive 2010/75/Eu Of The European Parliament And Of The Council, For Waste Incineration* (**EU Commission for WI, 2019**).

The upper range of the potential emissions is modelled to represent the worst case/ licence limit situation, and the plant designers' specification is modelled to represent expected emissions, given that these levels are higher than the levels measured at the similar, recently commissioned reference facility. Note that the designer's emission specifications factor in the natural loss of emissions control performance over time.

The results of the assessment are summarised as follows:

- All predicted impacts associated with all emissions from the proposal are within the applicable in-stack limits and ground level criteria, apart from cumulative ground level $PM_{2.5}$ and PM_{10} concentrations, due to the existing background levels which already exceed the criteria (as occurs across much of NSW). However, the predicted proposal contribution to ambient $PM_{2.5}$ and PM_{10} concentrations is small and would not result in any discernible or measurable impact.

- Deposition levels in the vicinity of Prospect Reservoir would be too low to discern or measure.
- Odour levels would be within the applicable odour assessment criteria at all receptors.

The proposal has been designed to meet the requirements of the *Commission Implementing Decision (EU) 2019/2010 Of 12 November 2019 Establishing The Best Available Techniques (BAT) Conclusions, Under Directive 2010/75/Eu Of The European Parliament And Of The Council, For Waste Incineration* (**EU Commission for WI, 2019**), document which sets the European Union environmental standards for waste incineration.

The proposal would apply a range of contemporary Best Practice and Best Available Techniques (BAT) design and management measures to minimise emissions. These measures include, for example;

- negative air in the bunker hall, with air drawn through the boiler, plus an exhaust system equipped with an active carbon filter to control odour escaping from the waste bunker when the boiler(s) may be inactive.
- A moving grate furnace with primary and secondary air fans designed to combust waste at high temperatures under optimised oxygen levels for efficient combustion.
- SNCR with ammonia injection system for the removal of NO_x. Any unreacted ammonia from a SNCR system is also removed by the wet scrubber.
- A rapid cooling system to prevent de-novo formation of dioxins.
- A semi dry flue gas treatment system with wet scrubber comprising carbon injection, lime injection, bag filters, and a post flue gas polishing wet scrubber to mitigate emissions of acidic flue gases and metals.
- Auxiliary burners and two dedicated ID fans in the combustion air system, ensuring the flue gas treatment system can continue to operate facilitating safe start-ups and shutdowns.
- In addition to these control systems, continuous emissions monitoring will be in operation throughout the process including the flue gas streams, allowing for automatic adjustments to the combustion system and the flue gas cleaning system.

The proposal uses proven best-practice technology for the combustion of commonly utilised wastes.

The air quality assessment shows that relative to the NSW impact assessment criteria, the proposal would not result in any adverse impact upon the surrounding environment or receptors.

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1 INTRODUCTION

Cleanaway and Macquarie Capital (the proponent) are jointly developing an energy-from-waste (EfW) facility known as the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal).

The proposal will be designed to thermally treat up to 500,000 tonnes per year of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. This process would generate up to 58 megawatts (MW) of base load electricity some of which would be used to power the facility itself with the remaining 55MW exported to the grid. The proposal involves the building of all onsite infrastructure needed to support the facility including site utilities, internal roads, weighbridges, parking and hardstand areas, storm water infrastructure, fencing and landscaping.

The proposal site is located at 339 Wallgrove Road in Eastern Creek, NSW (Lot 1 DP 1059698) which is in the Blacktown local government area (LGA). The site is in the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management.

The 8.23ha site is divided by a small strip of land not part of the proposal site, resulting in a 2.04ha northern section and a 6.19ha southern section. This dividing strip is part of the adjacent lot and includes a right of carriageway benefitting the proposal site allowing vehicles to move between the two sections of the site. The proposal area will be fully contained in the 6.19ha portion of the site. Works to occur on the 2.04 ha northern section of the site include the clearing of weeds and exotic vegetation within the existing overland flow channel which is confined to the eastern section of this parcel of land. The northern section will also be used temporarily to support construction works. It is not currently expected that any other works will occur on the 2.04 ha northern section of the site as part of this proposal.

This report presents an assessment of potential air quality impacts associated with the WSERRC. The air quality impact assessment has been prepared in general accordance with the New South Wales (NSW) Environment Protection Authority (EPA) document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2017**). The assessment forms part of the environmental impact statement (EIS) prepared for the proposal.

2 STUDY REQUIREMENTS

The purpose of this report is to provide an assessment of the maximum likely impacts on air quality that may arise due to the proposal. The assessment presented in this report addresses the planning and regulatory agency requirements relevant to air quality, as set out below.

2.1 DPIE, Secretary's Environmental Assessment Requirements

In preparing this Air Quality Assessment, the Secretary's Environmental Assessment Requirements issued for the proposal in December 2019 have been addressed. The key matters raised for consideration in this Air Quality Assessment are outlined in **Table 2-1** along with a reference as to where the requirements are addressed in the report.

Table 2-1: Secretary's Environmental Assessment Requirements

Specific Issue	General requirements	Section
Air quality and odour:	A quantitative assessment of the potential air quality, dust and odour impacts of all stages of the development (construction and operation) on surrounding landowners, businesses and sensitive receptors, in accordance with the relevant Environment Protection Authority guidelines, including 'worst case' emission scenarios (including a trip or emergency shutdown)	Section 6.6 and Section 7
	Identification of all potential fugitive and point source emissions of pollutants and odour for all stages of the proposal.	Section 6.5 to Section 6.9
	Details of the receiving environment, including meteorology and climate, Topography, surrounding land use, sensitive receptors and ambient air quality	Section 3.1 and Section 5
	Justification for the level of assessment undertaken on the basis of risk factors, including but not limited to the proposal location, characteristics of the receiving environment and the type and quantity of the pollutants emitted	Section 6
	Details of the proposed technology and a demonstration that it is technically fit for purpose, including details of commissioning and proof of performance	Section 8, and Technical Report D Best Available Techniques Assessment
	Details of emission control techniques and practices, including emission sampling and monitoring, that will be employed, and benchmark these against best practice emission control and management, with reference to the European IPPC Bureau 'Industrial Emissions Directive', BAT (Best Available Techniques) Reference Document (BREF) BREF 2019 and the Environment Protection Authority's 'NSW Energy from Waste Policy Statement' (2015)	Section 8
	Demonstrate a commitment to continual improvement with respect to emission control techniques and practices	Chapter 3 Proposal description
	An assessment of cumulative air quality impacts associated with the facility and surrounding developments, including any approved (but not yet constructed) developments and The Next Generation's proposal for an energy from waste facility at Eastern Creek (currently subject to proceedings in the NSW Land and Environment Court).	Section 6.10 and Section 7.2

2.2 NSW Environmental Protection Authority requirements

This Air Quality Assessment has been prepared in general accordance with the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2017**). The specific EPA requirements for the proposal are outlined in **Table 2-2** along with a reference to where the requirements are addressed in the report.

Table 2-2: NSW EPA specific requirements

Specific Issue	General requirements	Section
Air Quality	The EIS for the proposal should include an Air Quality Impact Assessment (AQIA), prepared in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016.* This AQIA should: Identify all potential discharges of fugitive and point source emissions of pollutants and odour for all stages of the proposal. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of all emissions must be provided.	Section 6.5 to Section 6.9
	Describe the receiving environment in detail. The proposal must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to: • meteorology and climate; • topography; • surrounding land-use • identified sensitive receptors; and • ambient air quality.	Section 3.1 and Section 5
	Identify comparable facilities within the airshed and consider the cumulative impact of air emissions from these facilities.	Section 6.10 and Section 7.2
	Assess all risks to the environment, human health and amenity associated with emissions of air pollutants, including odour, from all stages of the proposal.	Section 6.5, to Section 6.9 and Section 7
	Justify the level of assessment undertaken on the basis of risk factors, including but not limited to: • proposal location; • characteristics of the receiving environment; and • type and quantity of pollutants emitted.	Section 6
	Include a consideration of 'worst case' emission scenarios and impacts at proposed emission limits including consideration of what emissions may be released during a trip or emergency shut down.	Section 6.4 and Section 7.4
	Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.	Section 6.10 and Section 7.2
	Include air dispersion modelling conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016.*	Section 6
	Demonstrate the proposal's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act (1997)* and the *POEO (Clean Air) Regulation (2010).*	Section 6.5
	Detail emission control techniques/ practices, including emission sampling and monitoring, that will be employed by the proposal, and benchmark these techniques/ practices against best practice emission control and management.	Section 8, and Technical Report D Best Available Techniques Assessment

2.3 NSW Health requirements

The NSW Health specific requirements issued for the proposal are outlined in **Table 2-3** along with a reference to where the requirements are addressed in the report.

Table 2-3: NSW Health specific requirements

Specific Issue	General requirements	Section
Air Quality	The inclusion of a clear and detailed comparison between the proposed waste feedstock for the Western Sydney Energy and Resource Recovery Centre (WSERRC) and the chosen European reference facilities.	Technical Report C Waste and Resource Management Assessment
	Clear information on the expected air quality and odour emissions from the proposed development based on the European reference facility and compliance with the relevant NSW/Australian and European Union (EU) emission controls.	Section 6.5 and Section 6.9
	Description of local meteorological and topographical conditions used in air dispersion modelling in the calculation of the local ground level impacts on the surrounding community and facilities.	Section 3.1, Section 5 and Section 6.2.1

2.4 Blacktown City Council

The Blacktown City Council's specific requirements issued for the proposal have been addressed and are outlined in **Table 2-4** along with a reference to where the requirements are addressed in the report.

Table 2-4: Blacktown City Council's specific requirements

Specific Issue	General requirements	Section
Air quality:	Address air quality and human health impacts by way of the following: • a quantitative assessment of the potential air quality and odour impacts of the development on surrounding landowners, the locality in general and sensitive receptors under the relevant Environment Protection Authority guidelines.	Section 7
	• a description of construction and operational impacts, including air emissions from the transport of materials.	Section 6.5 to Section 6.9
	• a human health risk assessment covering the inhalation of criteria pollutants and exposure (from all pathways, i.e. inhalation, ingestion and dermal) to specific air toxics.	Health Risk Assessment
	• details of any pollution control equipment and other impact mitigation measures for fugitive and point source emissions.	Section 8 and Technical Report D Best Available Techniques Assessment
	• a demonstration of how the facility would be operated in accordance with world best practice measures to manage toxic air emissions, with consideration of the European Union's Waste Incineration Directive 2000 and the Environment Protection Authority's policy statement NSW Energy from Waste.	Section 8 and Technical Report D Best Available Techniques Assessment
	• an examination of best practice management measures for the mitigation of toxic air emissions and their incorporation into the design and control features of the facility	Section 8 and Technical Report D Best Available Techniques Assessment

Specific Issue	General requirements	Section
	• details of the proposed technology to be utilised and conclusive demonstration that it is technically fit for purpose and that it represents world best practice	Section 8 and Technical Report D Best Available Techniques Assessment
	• detail contingency plans for any potential incidents or equipment failure during the operation of the project.	Section 8 and Technical Report D Best Available Techniques Assessment
	The applicant should demonstrate how they will broadcast real time emission testing data online, giving the general public the ability to view and monitor the daily emissions from the facility.	Section 8.3
	Obtain accurate air quality baseline data within a 1 km radius of the site.	Section 5.3.2

2.5 WaterNSW

The WaterNSW specific Requirements issued for the proposal have been addressed and are outlined in **Table 2-5** along with a reference to where the requirements are addressed in the report.

Table 2-5: WaterNSW specific requirements

Specific Issue	General requirements	Section
Air Quality	Prospect Reservoir lies approximately 1.9km from the site. Assessment of the potential dust/ash and air quality impacts on this sensitive receiver should be assessed.	Section 7.3

3 PROPOSAL BACKGROUND

3.1 Proposal setting

The proposal site is located at 339 Wallgrove Road, Eastern Creek, and approximately 33 kilometres (km) west of the Sydney Central Business District (CBD). The site covers an area of approximately 8.2 hectares (ha) with the surrounding land use characterised as predominantly industrial and commercial with residential and agricultural land use to the southwest.

The existing site includes buildings associated with a disused poultry facility, which will be cleared from the site prior to starting construction. The site is bounded by the M7 Motorway to the west with the Eastern Creek industrial area located farther west. The now-closed Eastern Creek landfill site (which still has an operational organics recycling facility component) is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor with the Austral Bricks facility located farther south.

The nearest residential area is located around 1 km to the south of the site. The Erskine Park residential area is located around 3.5 km to the west with Minchinbury located around 3 km to the north. Horsley Park Public School is located over 2 km south of the site and a childcare centre is located within the Eastern Creek industrial area approximately 1 km to the west of the site.

Figure 3-1 presents the location of the proposal and nearby receptors assessed as discrete receptors in this assessment. Note that receptors in this assessment include residential receptors (residential dwellings, childcare centre and farms), industrial and other receptors (industrial and commercial operations and other community spaces such as clubs, recreational spaces and places of worship) located within a 3km radius from the proposal. A list of the assessed receptors is provided in **Appendix D**. The maximum impacts from the project would be within the 3 km radius of the proposal used for identifying specific receptors, however it should be noted that potential impacts are assessed over the entire modelling domain, and not just at the named discrete receptor locations.

Figure 3-2 presents a pseudo three-dimensional visualisation of the topography in the general vicinity of the proposal. The topography can be characterised as undulating hills with elevation dropping to the east at Prospect Reservoir and a ridgeline to the south of the site.

Figure 3-1: Proposal setting and assessed receptor locations

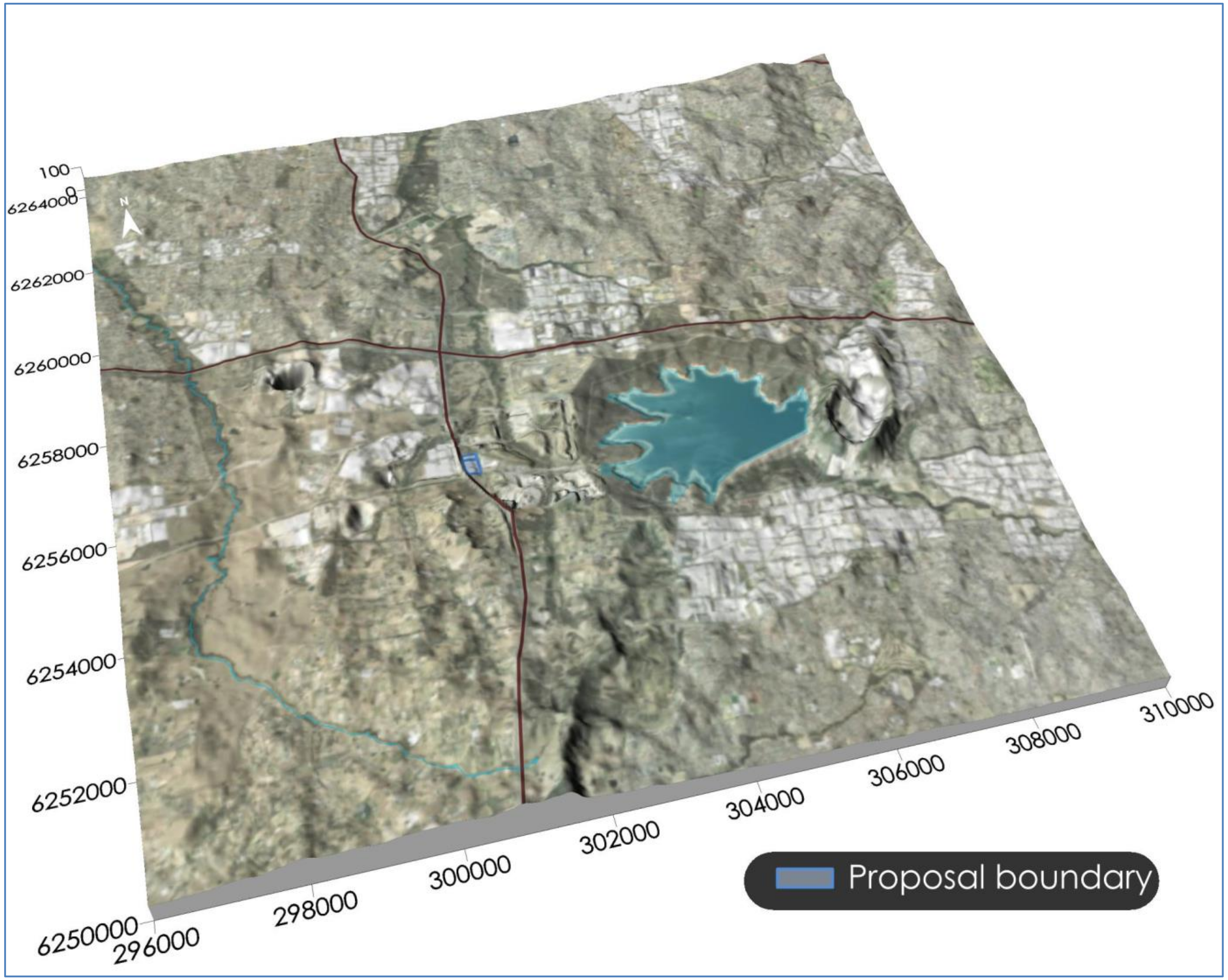

Figure 3-2: Representative visualisation of topography in the area surrounding the proposal

3.2 Proposal description

It is proposed to construct and operate an energy-from-waste facility which will involve the thermal processing of residual municipal solid waste (MSW) and residual commercial and industrial (C&I) waste material. The details of the waste stream contents are discussed in Technical Report C Waste and Resource Management Assessment.

The proposal will have a nominal capacity to process 500,000 tonnes per annum (tpa) (and can handle up to 75 tonnes per hour) of waste to generate up to 58 megawatts (MW) of power of base load electricity, up to 55MW of which is exported to the grid. The proposal will consist of two identical incineration lines, equivalent to a nominal capacity of 250,000tpa per line, and have one waste hall and turbine.

As described in **Section 8.5**, the Incinerator Bottom Ash (IBA) produced from the combustion process will be recovered and recycled. Following metals recovery, the residual bottom ash will be transported offsite for recycling or disposal at a licensed facility. Boiler Fly Ash is controlled via the flue gas cleaning system and the Flue Gas Treatment residues (FGTr) which comprise the residual ash and spent reagents from the flue gas cleaning system are collected in the bag house filter. Ash handling would occur in sealed processes or via transfers within the facility with all doors closed.

A detailed description of the plant design and pollution controls is set out in **Section 3.2.1.** The proposed mitigation management and pollution control technology is examined further in **Section 8**

3.2.1 Plant operation

The proposal is designed to have capacity to operate within a range of different Load Points (LPs). The LP's vary according to the input tonnes per hour (t/hr) of waste, varying calorific value in Megajoules per kilogram (MJ/kg) of the waste and a varying thermal load in Megawatts (MW) for the boiler. **Figure 3-3** below presents a capacity diagram for a single line demonstrating this relationship.

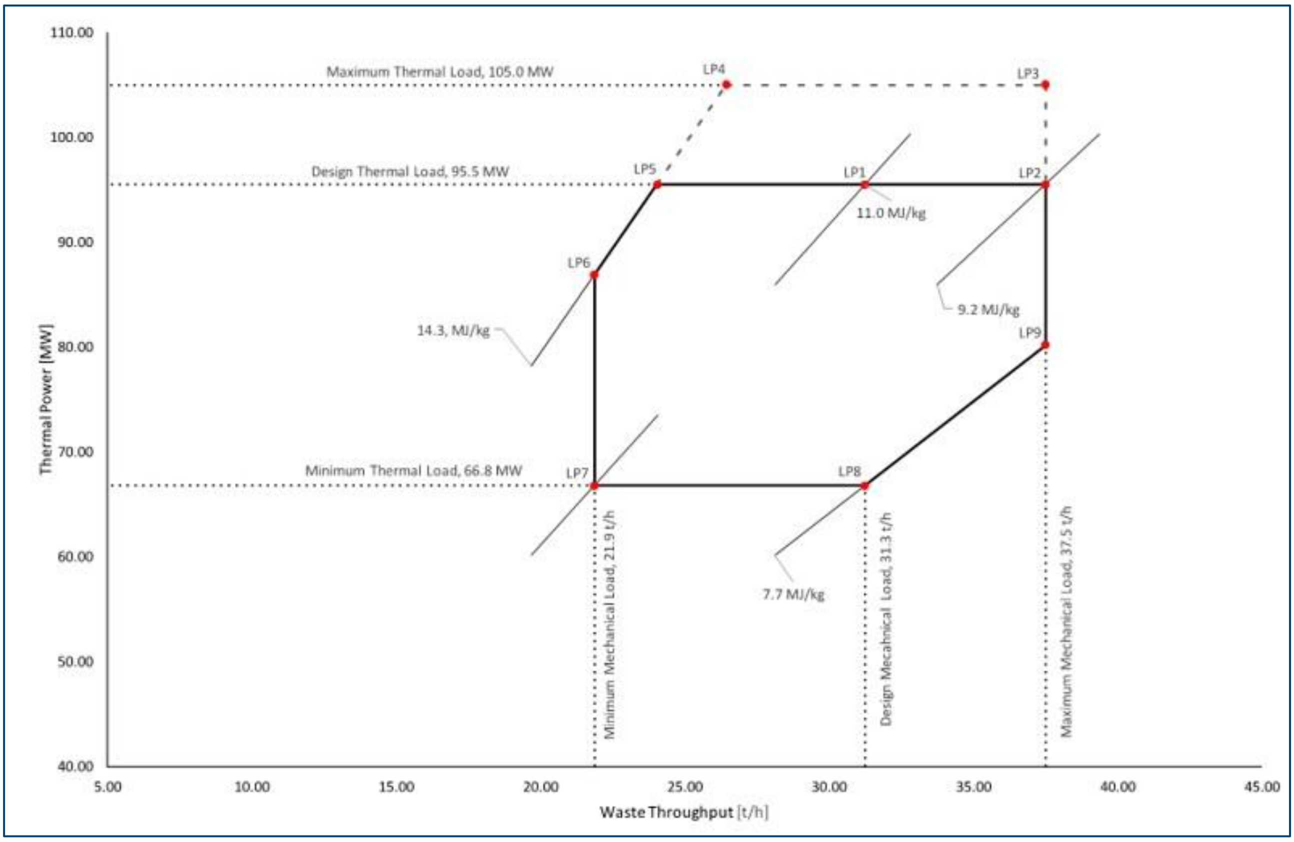

Figure 3-3: Capacity diagram for the proposal

In addition to modelling emissions at the flow conditions for each LP, the modelling applies conservative estimates for the plant emissions, consistent with the maximum potential levels that might be emitted, thus accounting for any potential variability in the feed waste material affecting the post treatment emissions that may be released. This is evident in **Section 6.5.4** where the measured emissions from the comparable reference plant in Dublin, are much lower than the levels modelled in every assessed scenario.

The proposed plant is designed to operate close to the design point (LP1) at 31.3 t/hr at a calorific value of 11.0 GJ/t, which is equivalent to 344.3 GJ/hr or 95.5 MW.

It should be noted that due to normal variability in the composition of the waste fuel, the system tends to keep the thermal load as constant as possible by varying the material throughput (i.e. moving horizontally on the line between LP2 and LP5). The mixing of waste in the waste bunker to make it homogeneous will result in maintaining operations as close as possible to the selected thermal load of the facility hence any large short term fluctuations are avoided as much as possible.

Figure 3-3 shows several slanted lines for a range of calorific values for the fuel, between 7.7 GJ/t (line between LP8 and LP9) and 14.3 GJ/t (line between LP5 and LP6). The diagram shows that the plant design allows for variations of ±30% around the design point calorific value of the fuel of 11.0 GJ/t.

Waste throughput would range from between 21.9 t/hr (line between LP6 and LP7) and 37.5 t/hr (line between LP3 and LP9), corresponding to a throughput ranging from 70% to 120% of the design point throughput to allow for short term variability in the calorific value of the feedstock.

It should be noted that not all combinations of min-max calorific value and min-max throughput give valid operational points as shown in **Figure 3-3**. The "corners" of the capacity diagram are represented by specific load points. LP1, LP2 and LP5 represent the nominal 100% thermal load at which the proposal can operate. LP3 and LP4 represent the maximum thermal load which is 110% of the nominal thermal load per the expected fluctuations above the preferred operational points (LP1, LP2 and LP5). LP7 and LP8 represent the minimum thermal load which is 70% of the nominal thermal load.

The proposal would be able to continuously operate at LP1, LP2, LP5, LP6, LP7, LP8 and LP9 for periods over an hour. Operation at a thermal overload (LP3 and LP4) will only occur for short term (minutes to an hour or so) fluctuations. Further details regarding the controls in place to minimise short term fluctuations at thermal overload are considered in **Section 7.4.2**.

The proposal is designed to ensure a minimum availability of 8000 hours per year (h/yr) per incineration line to account for inspection stops, maintenance periods and any unplanned stop of main systems and equipment. A summary of the available operating hours and typical stopping hours per year is presented below in **Table 3-1**.

Table 3-1: Available operating hours for the proposal

Operating period	Hours per year
Availability per line	8,000
Scheduled maintenance stop	336
Scheduled inspection stop	48
Unplanned stop	376
Total	**8,760**

Operation and maintenance of the proposal has capacity to ensure that one line is essentially always available to receive and process waste. The bunker will have the capacity to accommodate volumes of waste corresponding with at least seven days operating capacity of both lines at nominal capacity.

A summary of the typical percentage of time the number of lines may be in operation is presented below in **Table 3-2**.

Table 3-2: Percentage of time for lines in operation

Number of lines in operation	Percentage of time (%)
0	0.6
1	16.2
2	83.2
Total	**100**

An indicative site layout of the proposal is shown in **Figure 3-4**.

The proposed mitigation management and pollution control technology is examined further in **Section 8**

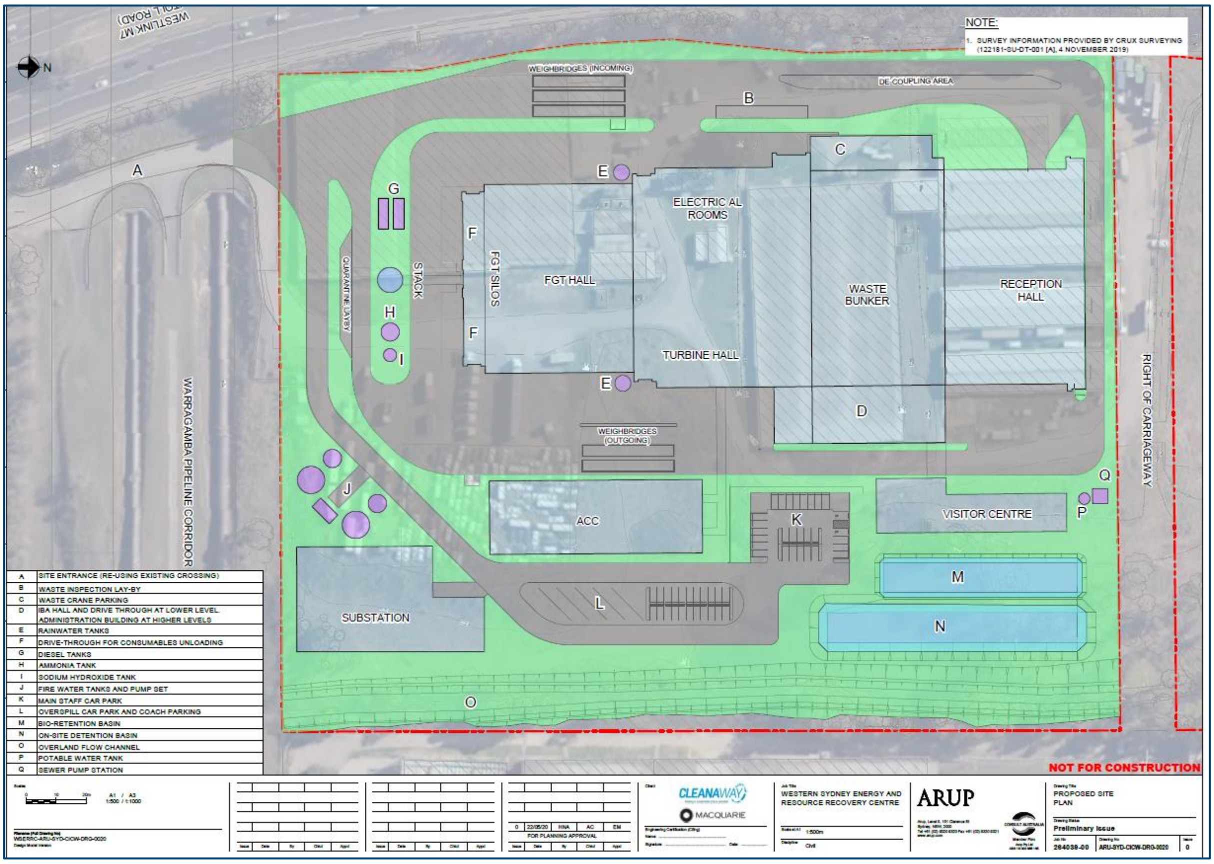

Figure 3-4: Indicative site layout for the proposal

4 AIR QUALITY ASSESSMENT CRITERIA

Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality. The sections below identify the applicable air quality criteria and in-stack pollutant concentration limits relevant to the proposal.

4.1 NSW EPA impact assessment criteria

Table 4-1 summarises the air quality criteria that are applicable to this assessment as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2017**).

The air quality criteria for total or cumulative impact relate to the total air quality burden in the air and not just the air emissions from the proposal. Consideration of background levels needs to be made when using these criteria to assess potential impacts. Some of the criteria, designated as incremental criteria, apply to only the emissions from the proposal, i.e. excluding background levels.

Table 4-1: NSW EPA air quality impact assessment criteria

Pollutant	Averaging Period	Percentile	Impact	Criterion	Units
Total Suspended Solids (TSP)	Annual	100	Total	90	µg/m^3
Particulate Mater 10 micrometers or less in diameter (PM_{10})	Annual	100	Total	25	µg/m^3
	24-hour	100	Total	50	µg/m^3
Particulate Mater 2.5 micrometers or less in diameter ($PM_{2.5}$)	Annual	100	Total	8	µg/m^3
	24-hour	100	Total	25	µg/m^3
Deposited dust	Annual	100	Incremental	2	g/m^2/month
		100	Total	4	g/m^2/month
Sulfur dioxide (SO_2)	10-minute	100	Total	712	µg/m^3
	1-hour	100	Total	570	µg/m^3
	24-hour	100	Total	228	µg/m^3
	Annual	100	Total	60	µg/m^3
Nitrogen dioxide (NO_2)	1-hour	100	Total	246	µg/m^3
	Annual	100	Total	62	µg/m^3
Hydrogen fluoride (HF)	90 days	100	Total	0.5[(1)] / 0.25[(2)]	µg/m^3
	30 days	100	Total	0.84[(1)] / 0.4[(2)]	µg/m^3
	7 days	100	Total	1.7[(1)] / 0.8[(2)]	µg/m^3
	24-hour	100	Total	2.9[(1)] / 1.5[(2)]	µg/m^3
Carbon monoxide (CO)	8-hour	100	Total	10,000	µg/m^3
	1-hour	100	Total	30,000	µg/m^3
	15-minute	100	Total	100,000	µg/m^3
Lead (Pb)	Annual	100	Total	0.5	µg/m^3
Total Organic Carbon (calculated as Benzene)	1-hour	99.99	Total	29	µg/m^3
Ammonia (NH_3)	1-hour	99.99	Incremental	330	µg/m^3
Hydrogen chloride (HCl)	1-hour	99.99	Incremental	140	µg/m^3
Mercury (Hg)	1-hour	99.99	Incremental	1.8	µg/m^3
Cadmium (Cd)	1-hour	99.99	Incremental	0.018	µg/m^3
Dioxins and furans	1-hour	99.99	Incremental	2.0x10^-06	µg/m^3
Arsenic (As)	1-hour	99.99	Incremental	0.09	µg/m^3
Antimony (Sb)	1-hour	99.99	Incremental	9	µg/m^3

Pollutant	Averaging Period	Percentile	Impact	Criterion	Units
Chromium (Cr)	1-hour	99.99	Incremental	0.09	µg/m³
Copper (Cu)	1-hour	99.99	Incremental	18	µg/m³
Manganese (Mn)	1-hour	99.99	Incremental	18	µg/m³
Nickle (Ni)	1-hour	99.99	Incremental	0.18	µg/m³
Beryllium (Be)	1-hour	99.99	Incremental	0.004	µg/m³

Source: **NSW EPA, 2017**

[1] General land use, which includes all areas other than specialised land use

[2] Specialised land use, which includes all areas with vegetation sensitive to fluoride, such as grape vines and stone fruit

µg/m³ = micrograms per cubic metre

g/m²/month = grams per square metre per month

4.2 NSW Energy from Waste (EfW) Policy requirements

The *NSW Energy from Waste Policy Statement* (**NSW EPA, 2015**) sets out the policy framework and the emission limits that facilities in NSW proposing to thermally treat waste for the recovery of energy must comply with.

Facilities proposing to recover energy from waste must meet current internal best practice techniques, particularly with respect to plant and operation design, pollutant control systems and equipment, emissions monitoring which include real-time feedback to the operations of the process, and the management of incoming and residual waste. It must be demonstrated through reference to fully operation plants treating the same input of waste stream and use of the same pollution control technologies in similar jurisdictions that the proposed facility is capable of ensuring emissions will not pose a risk of harm to the community.

A specific best practice assessment in this regard is made in Technical Report D Best Available Techniques Assessment.

4.2.1 Best practice

The WSERRC has a focus on achieving international best practice environmental performance standards to be compliant with the BAT recommendations and NSW EfW policy. Best Practice mitigation and management strategies are explored further in the Technical Report D Best Available Techniques Assessment and are outlined in **Section 8** of this assessment. The selection of the proposed technology for the WSERRC has been based on proven and cost-effective technology used in a number of recent reference facilities of similar capacity and processing similar waste types in commercial operation for more than one year that can fulfil the requirements of the NSW EfW Policy.

4.2.2 Reference facility

In order to demonstrate compliance in line with the NSW EfW policy, the WSERRC has considered two reference facilities, one in Dublin, Ireland and the other in Filborna, Sweden, both of which are described in Chapter 5 'EfW Policy'.

The Dublin reference operates at 24 hours a day, 7 days a week. The facility has two incineration lines with an annual capacity of 300,000 tpa per line, i.e. a total annual capacity of 600,000 tpa. and treats a mixture of municipal solid waste and industrial waste and minor quantities of various other waste, to generate and export 60MW of electricity.

The Filborna reference operates at approximately 8,000 hours/y. The facility has an annual capacity of 200,000 tonnes and treats a mixture of municipal solid waste (80,000 tpa, 40 %) and industrial waste (120,000 tpa 60%) to generate and export 18MW of electricity and 60MW of heat.

Both facilities consist of a moving grate technology in the combustion process and a selective non-catalytic reduction (SNCR) and a semi dry flue gas treatment system with lime and activated carbon and a wet scrubber to assist in pollution control. Both facilities demonstrate compliance of an EfW facility similar in composition of waste and proposed technology to the proposed WSERRC facility.

It is noted that the total annual capacity of the Dublin facility is more consistent with the proposal. Due to this and also because there is significantly more available stack monitoring data for the Dublin facility, it has been considered in detail in this report, for example when making the emissions comparisons with limits in **Section 6.5.4** and those modelled for the proposal.

4.3 In-stack air emission limits

As per the NSW EfW policy, facilities proposing to recover energy from waste must meet current internal best practice techniques. As such, **Table 4-2** summarises the relevant NSW and best practice international air emission limits relating to waste incineration plants.

The NSW Government *Protection of the Environment Operations (Clean Air) Regulation 2010* (**POEO, 2010**) sets out the standards for certain groups of plant and premises to regulate industry's air impurity emissions. These limits apply to the pollutant concentrations in the stack.

Directive 2000/76/EC of the European Parliament and the Council on the Incineration of Waste (**EU WID, 2000**) sets out operational conditions, technical requirements, and emission limit values for incineration and co-incineration plants within the European Union (EU) to prevent or to reduce as far as possible their negative effects on the environment. It is noted that this directive was replaced with the European Directive 2010/75/EU.

European Directive 2010/75/EU of the European Parliament and the Council on Industrial emissions (**EU IED, 2010**) is the main EU instrument regulating pollutant emissions from industrial installations through better application of Best Available Techniques (BAT) to reduce industrial emissions.

Commission Implementing Decision (EU) 2019/2010 Of 12 November 2019 Establishing The Best Available Techniques (BAT) Conclusions, Under Directive 2010/75/Eu Of The European Parliament And Of The Council, For Waste Incineration (**EU Commission for WI, 2019**) is part of a series of documents which include the conclusions from an exchange of information between EU Member States, the industries concerned, non-governmental organisations promoting environmental protection, and the Commission. The BAT conclusions include BAT-Associated Emission Levels (BAT-AELs) that aim to ensure emissions from the waste incineration sector are kept low.

It is noted that the 2019 BAT-AELs include emission limits as a range, where various emission limits may be achieved depending on the associated waste streams in the proposal and the included pollution control technologies. For conservatism, this assessment has focused on ensuring the proposal can meet the impact assessment criteria for plant emissions at the upper range of the BAT-AELs.

Note that where the emission limits are the results of spot sampling, the averaging periods of the air emission limits in **Table 4-2** are set out in the notes below the table. Otherwise the emission limits in **Table 4-2** are daily averages**.**

Table 4-2: Air emission limits (mg/m^3)

Pollutant	NSW POEO Limit(1)	EU IED Limit(2)	BAT-AELs (low – high) (3)
CO	125	50	10 - 50
Total organic carbon (TOC)	40	10	<3-10
Dust	50	10	<2-5
HCl	100	10	<2-6
HF	50	1	<1
SO_2	-	50	5-30
NO_2	500	200	50-120
NH_3	-	-	2-10
Hg	0.2	0.05	<0.005 - 0.02(4)
			0.001 - 0.01(5)
Cd + Thallium (Tl)	0.2 *Cd only	0.05	0.005 - 0.02(4)
Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V	-	0.5	0.01 - 0.3(4)
Dioxins and furans	1.00E-07	1.00E-07	-
Polychlorinated dibenzodioxins and furans (PCDD/F)	-	-	$< 1\cdot10^{-8} - 4\cdot10^{-8}$ (4)
	-	-	$< 1\cdot10^{-8} - 6\cdot10^{-8}$ (5)
PCDD/F + dioxin-like PCBs	-	-	$< 1\cdot10^{-8} - 6\cdot10^{-8}$ (4)
	-	-	$1\cdot10^{-8}$-$8\cdot10^{-8}$(5)

(1) Protection of the Environment Operations (Clean Air) Regulation 2010 – Group 6 [POEO], Sampling period of 1 hour or the minimum sampling period specified in the relevant test method referred to in the POEO. HF has a sampling period over a daily average.

(2) European Union Industrial Emissions Directive 2010/75/EU – Air Emission Daily Limit Values

(3) Commission Implementing Decision (EU) 2019/2010 Of 12 November 2019 Establishing The Best Available Techniques (BAT) Conclusions, Under Directive 2010/75/Eu Of The European Parliament And Of The Council, For Waste Incineration (**EU Commission for WI, 2019**) (*).

(4) Average over the sample period – Hg measurement taken from continuous measurements. Metals (Cd+Tl, Hg, Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V) have sampling period of a minimum 30 minutes and a maximum of 8 hours. Dioxins and furans have a sampling period of a minimum 6 hours and a maximum of 8 hours (*).

(5) Long-term sampling period average – Hg long-term sampling period of 2-4 weeks (*).

(*) It is noted that the long term criteria for dioxins are less stringent than the short term criteria in Table 7 in the newly released (**EU Commission for WI, 2019**), hence it appears that the averaging periods have been inadvertently switched in the table.

4.4 Odour

Odour in a regulatory context needs to be considered in two similar, but different ways depending on the situation.

NSW legislation (*Protection of the Environment Operations Act, 1997)* prohibits emissions which cause offensive odour. Offensive odour is evaluated in the field by authorised officers, who are obliged to consider the odour in the context of its receiving environment, strength, nature, duration, character or quality, time which it is emitted or any other circumstances to determine whether the odour would be harmful (or likely to be harmful) to a person outside the premises or which would interfere with the comfort and repose of the normal person unreasonably. In this context, the concept of offensive odour is applied to operational facilities and relates to actual emissions in the air.

However, in the approval and planning process for proposed new operations or modifications to existing projects, no actual new odour exists, and it is necessary to consider hypothetical odour. In this context, odour concentrations are used and are defined in odour units. The number of odour units represents the number of times that the odour would need to be diluted to reach a level that is just detectable to the human nose. Thus by definition, odour less than one odour unit (1 OU), would not be detectable to most people.

The range of a person's ability to detect odour varies greatly in the population, as does their sensitivity to the type of odour. The wide ranging response in how any particular odour is perceived by any individual poses specific challenges in the assessment of odour impacts and the application of specific air quality goals related to odour. The NSW Odour Policy (**NSW DEC, 2006**) sets out a framework specifically to deal with such issues.

It needs to be noted that the term odour refers to complex mixtures of odours, and not "pure" odour arising from a single chemical. Odour from a single, known chemical very rarely occurs (when it does, it is best to consider that specific chemical in terms of its concentration in the air). In most situations odour will be comprised of many substances which is referred to as a complex mixture of odour, or more simply odour.

For activities with potential to release significant odour it may be necessary to predict the likely odour impact that may arise. This is done by using air dispersion modelling which can calculate the level of dilution of odours emitted from the source at the point that such odour reaches surrounding receptors. This approach allows the air dispersion model to produce results in terms of odour units.

The NSW criteria for acceptable levels of odour range from 2 to 7 OU, with the more stringent 2 OU criteria applicable to densely populated urban areas and the 7 OU criteria applicable to sparsely populated rural areas, as outlined below.

4.4.1 Complex mixtures of odorous air pollutants

Table 4-3 presents the assessment criteria as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (**NSW EPA, 2017**). This criterion has been refined to take into account population densities of specific areas and is based on a 99^{th} percentile of dispersion model predictions calculated as 1-second averages (nose-response time).

Table 4-3: Impact assessment criteria for complex mixtures of odorous air pollutants (nose-response-time average, 99th percentile)

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

Source: **NSW EPA, 2017**

The NSW odour goals are based on the risk of odour impact within the general population of a given area. In sparsely populated areas the criteria assume there is a lower risk that some individuals within the community would find the odour unacceptable, hence higher criteria apply.

Peak-to-mean factors are applied to account for any odour fluctuation above and below the mean odour level of the 1-hour averaging time. The criteria in **Table 4-3** are compared with modelled results that include peaking factors to account for the time-averaging limitations of air dispersion models. The peak-to-mean factors developed by **Katestone Scientific Pty Ltd (1995, 1998)** for NSW EPA are applied to convert the modelled (1-hour) averaging time to 1-second peak concentrations.

A summary of the peak-to-mean values is provided in **Table 4-4**.

Table 4-4: Peak-to-mean values

Source Type	Pasquill-Gifford stability class	Near field P/M 60*	Far field P/M 60*
Area	A, B, C, D	2.5	2.5
	E, F	2.3	1.9
Line	A-F	6	6
Surface point	A, B, C	12	4
	D, E, F	25	7
Tall wake-free point	A, B, C	17	3
	D, E, F	35	6
Wake-affected point	A-F	2.3	2.3
Volume	A-F	2.3	2.3

*Ratio of peak 1-second average concentrations

5 EXISTING ENVIRONMENT

This section describes the existing environment including the climate and ambient air quality in the are surrounding the proposal.

5.1 Local climatic conditions

Long-term climatic data from the closest Bureau of Meteorology (BoM) weather station at Horsley Park Equestrian Centre Automatic Weather Station (AWS) (Site No. 067119) were analysed to characterise the local climate in the proximity of the proposal. Horsley Park Equestrian Centre AWS is located approximately 3.5km northwest of the proposal.

Table 5-1 and **Figure 5-1** present a summary of data from the Horsley Park Equestrian AWS collected over a 13 to 22 year period for the various meteorological parameters.

The data indicate that January is the hottest month with a mean maximum temperature of 30.1 degrees Celsius (ºC) and July is the coldest month with a mean minimum temperature of 5.8ºC.

Rainfall decreases during the middle of the year, with an annual average rainfall of 748.4 millimetres (mm) over 74.0 days. The data indicate that February is the wettest month with an average rainfall of 103.6mm over 7.1 days and July is the driest month with an average rainfall of 35.2 mm over 5.0 days.

Relative humidity levels exhibit variability over the day and seasonal fluctuations. Mean 9am relative humidity ranges from 61% in October to 81% in March. Mean 3pm relative humidity levels range from 42% in August and September to 55% in June.

Wind speeds during the warmer months have a greater spread between the 9am and 3pm conditions compared to the colder months. Mean 9am wind speeds range from 8.9 kilometres per hour (km/h) in March to 12.5km/h in October. Mean 3pm wind speeds range from 12.9km/h in June to 19.9km/h in December.

Table 5-1: Monthly climate statistics summary – Horsley Park Equestrian Centre AWS

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Temperature													
Mean max. temp. (ºC)	30.1	28.9	26.9	23.9	20.6	17.6	17.4	19.1	22.4	24.8	26.6	28.4	23.9
Mean min. temp. (ºC)	17.9	17.8	16.2	13.0	9.0	7.2	5.8	6.4	9.2	11.8	14.4	16.3	12.1
Rainfall													
Rainfall (mm)	75.6	103.6	83.3	70.3	41.9	74.7	35.2	36.8	37.6	57.6	76.1	63.6	748.4
No. of rain days	7.6	7.1	8.0	6.8	5.0	6.3	5.0	4.0	4.8	5.7	6.8	6.9	74.0
9am conditions													
Mean temp. (ºC)	22.0	21.5	19.4	17.5	13.8	11.1	10.3	12.0	15.6	18.1	19.2	20.9	16.8
Mean R.H. (%)	73	77	81	76	77	80	78	70	65	61	70	71	73
Mean W.S. (km/h)	10.1	9.7	8.9	10.5	10.7	10.3	10.8	11.7	12.2	12.5	11.8	10.7	10.8
3pm conditions													
Mean temp. (ºC)	28.2	27.1	25.3	22.2	19.2	16.6	16.1	17.8	20.8	22.5	24.2	26.5	22.2
Mean R.H. (%)	49	53	54	53	52	55	50	42	42	45	50	48	49
Mean W.S. (km/h)	19.4	17.0	14.8	14.4	13.0	12.9	13.9	16.1	18.1	19.8	19.5	19.9	16.6

Source: **Bureau of Meteorology (2020)**

R.H. – Relative Humidity, W.S. – wind speed

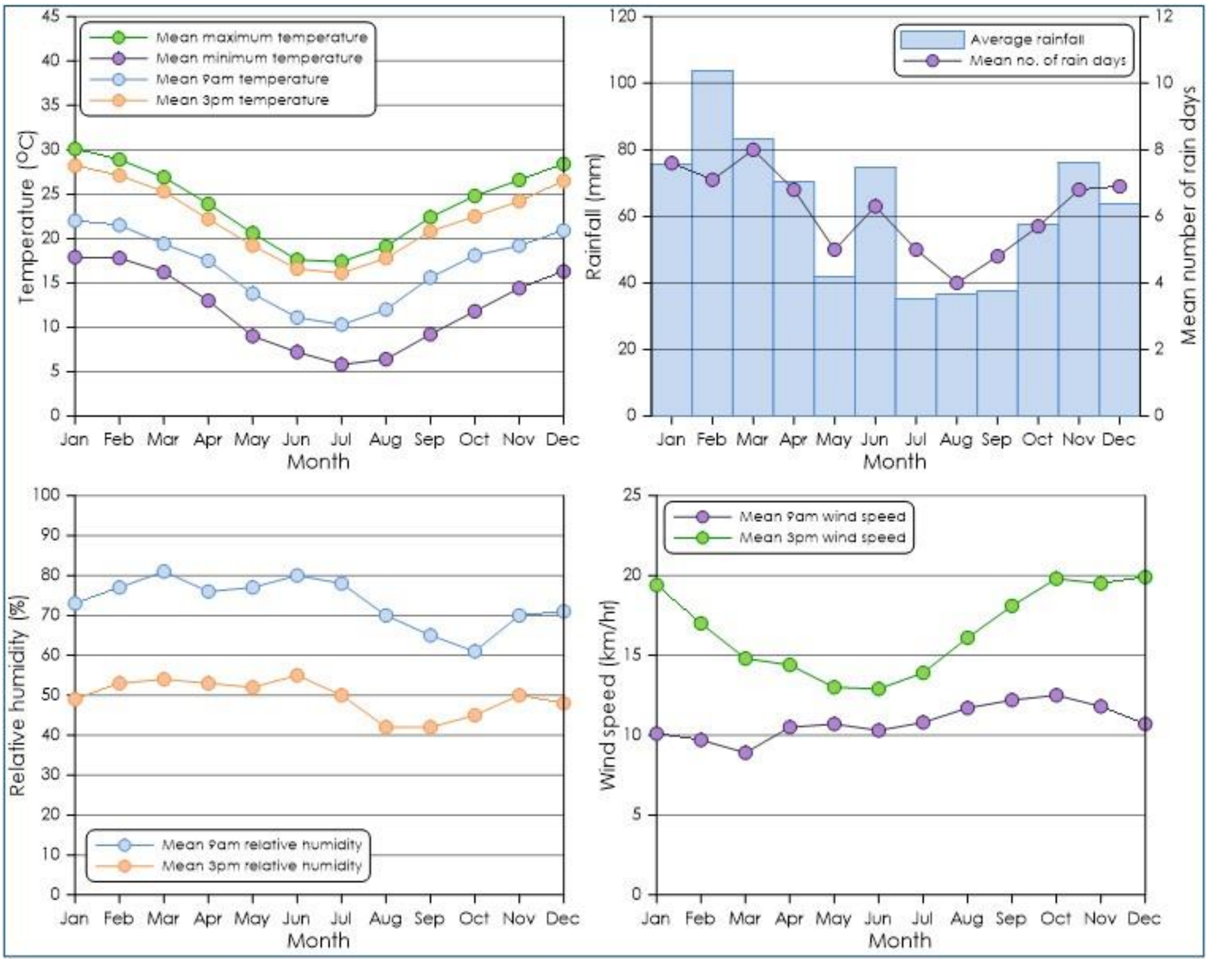

Figure 5-1: Monthly climate statistics summary – Horsley Park Equestrian Centre AWS

5.1.1 Climate change projections

Climate change projections have been considered in the Technical Report N Greenhouse Gas and Energy Efficiency Assessment.

The climate change trends expected to occur in Australia include;

- Increasing surface air and sea surface temperatures;
- Rising sea levels;
- Ocean acidification;
- Decreased rainfall in the southwest and southeast of Australia and increased rainfall across the northern parts of Australia. This in turn has led to a decrease in streamflow across southern Australian and an increase in northern Australia. Additionally, rainfall is expected to decrease in spring and winter and increase in summer and autumn; and,
- An increase in extreme fire weather and other climatic hazard events.

These climate change projections would not affect the emissions generated from the facility or have any tangible effect on the predicted air quality impact from the proposal. With the appropriate planning and management measures in place it is expected that any potential impacts of climate change can be easily managed for this project.

Appropriate measures have been included in the design of the WSERRC facility to optimise energy efficiency.

It needs to be considered that overall, the proposal would reduce waste disposal at landfill and thus provide an opportunity to reduce greenhouse gas intensive methane emissions and to provide a low-carbon energy source.

5.2 Local meteorological conditions

Annual and seasonal windroses for the Horsley Park Equestrian Centre AWS during the 2015 calendar period are presented in **Figure 5-2**.

The 2015 calendar year was selected as the meteorological year for the dispersion modelling based on an analysis of the long-term data trends in meteorological data recorded for the area as outlined in **Appendix A**.

On an annual basis, winds are generally varied and feature a predominant southwest wind. In summer, winds tend to occur from the southwest, east-northeast and the southeast quadrants. The autumn wind distribution is similar to the annual distribution with winds predominantly occurring from the southwest, and fewer winds from the northeast. In winter there are fewer winds originating from the east with winds occurring predominantly from the southwest and west-southwest. During spring the winds are varied from all directions with winds from the southwest most dominant.

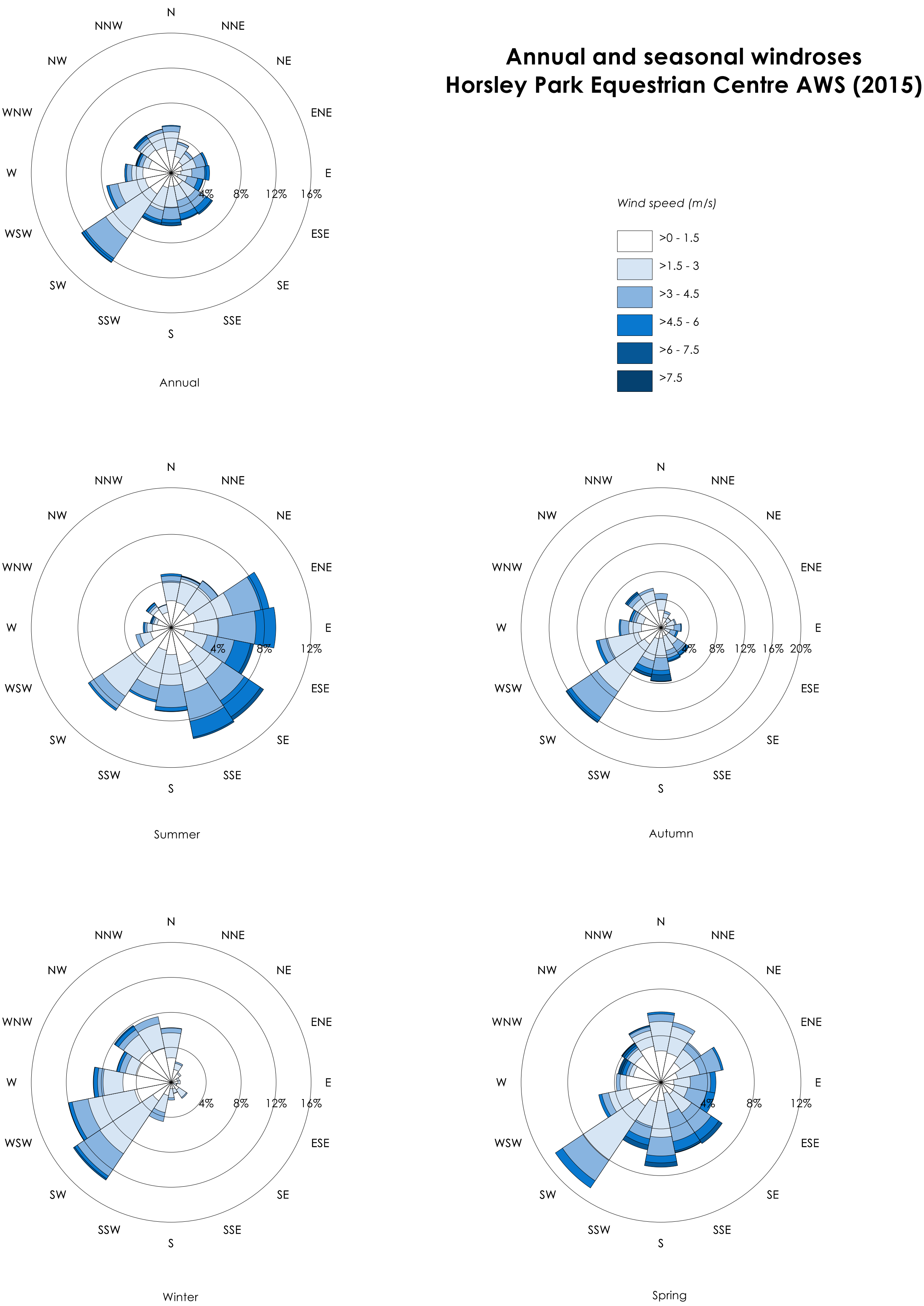

Figure 5-2: Annual and seasonal windroses – Horsley Park Equestrian Centre AWS (2015)

5.3 Ambient air quality

The main sources of air pollutants in the area surrounding the proposal include emissions from anthropogenic activities such as industrial and commercial sources, motor vehicle exhaust, wood heater emissions and various agricultural activities.

Climate change projections have been set out in the Technical Report N Greenhouse Gas and Energy Efficiency Assessment and are briefly examined in **Section 5.1.1** above. It is noted that although climate change may have an impact on the ambient air quality, e.g. more severe weather storms and bushfires may occur, it is unlikely to have any significant effect on the emissions from the facility, or the predicted impacts from the proposal as these are governed by the waste inputs and plant operation. In the event of an extreme weather event (e.g. bushfires, dust storms etc.) there may be an increase in the regional ambient air quality levels, and cumulative criteria may be exceeded, as presently arises. Compliance with cumulative air quality criteria is excluded under extraordinary event conditions for all operations, including the proposal. The proposal, like any other facility, would continue to operate and provide essential services in such conditions.

5.3.1 NSW DPIE Monitoring

The available data from the nearest air quality monitors operated were reviewed. The monitors are operated by the NSW Department of Planning, Industry & Environment (DPIE) and are located at Prospect (approximately 6.1 km northeast from the proposal), St Marys (approximately 8.6 km northwest from the proposal), Liverpool (approximately 13.5 km southeast from the proposal) and Bringelly (approximately 14.0 km southwest from the proposal).

5.3.1.1 PM_{10} monitoring

The available PM_{10} monitoring data from the nearest air quality monitors operated by the NSW DPIE have been reviewed and are summarised in **Table 5-2**. Values above the relevant criterion are presented in bold. Recorded 24-hour average PM_{10} concentrations are presented in **Figure 5-3**.

Table 5-2 indicates that the annual average PM_{10} concentrations were below the relevant criterion of 25µg/m^3 each year except in 2019 at the Liverpool and Prospect monitoring stations, (as would be expected given the extensive regional dust storms and bushfires in late 2019). Consistent with most other stations in NSW, the maximum 24-hour average PM_{10} concentrations recorded at these stations occasionally exceeded the relevant criterion of 50µg/m^3 during the review period.

It can be seen from **Figure 5-3** that elevated 24-hour average PM_{10} concentrations typically coincided with elevated levels at the other monitoring stations on the same day. Brief examination of the elevated PM_{10} levels indicates that they typically correspond with regional dust events and bushfires which affect a wide area, this is particularly evident in 2019 as a result of the NSW bushfires in November and December (**NSW OEH, 2019a & NSW OEH, 2019b**). At other times, potential dust sources such as local agricultural sources, industrial activity and other such dust sources may have contributed to periods of localised elevated PM_{10} levels.

Table 5-2: Summary of PM_{10} levels from NSW DPIE monitoring (µg/m³)

Year	Liverpool	Bringelly	St Mary	Prospect	Criterion
	Annual Average				
2014	19	16.6	16.7	17.6	**25**
2015	18.4	15.8	15	17.6	**25**
2016	19.5	16.9	16.1	18.9	**25**
2017	20.6	19.8	16.2	18.9	**25**
2018	24.2	21.3	-	21.9	**25**
2019	**27.7**	23.6	24.6	**26**	**25**
	Maximum 24-hour Average				
2014	40.8	42.6	45	44.3	**50**
2015	**68.6**	**57**	**53**	**68.7**	**50**
2016	**68.7**	**61.6**	**100.2**	**110.1**	**50**
2017	**74**	**83.7**	49.8	**61.1**	**50**
2018	**101.5**	-	-	**113.3**	**50**
2019	**178.9**	**134**	**159.8**	**182.8**	**50**
	Data capture (%)				
2014	97.8	98.4	98.9	93.4	-
2015	95.1	99.2	97.8	95.1	-
2016	99.5	98.6	96.7	98.9	-
2017	98.9	97.0	98.6	98.4	-
2018	98.4	98.4	78.1	99.5	-
2019	98.9	98.6	98.4	99.2	-

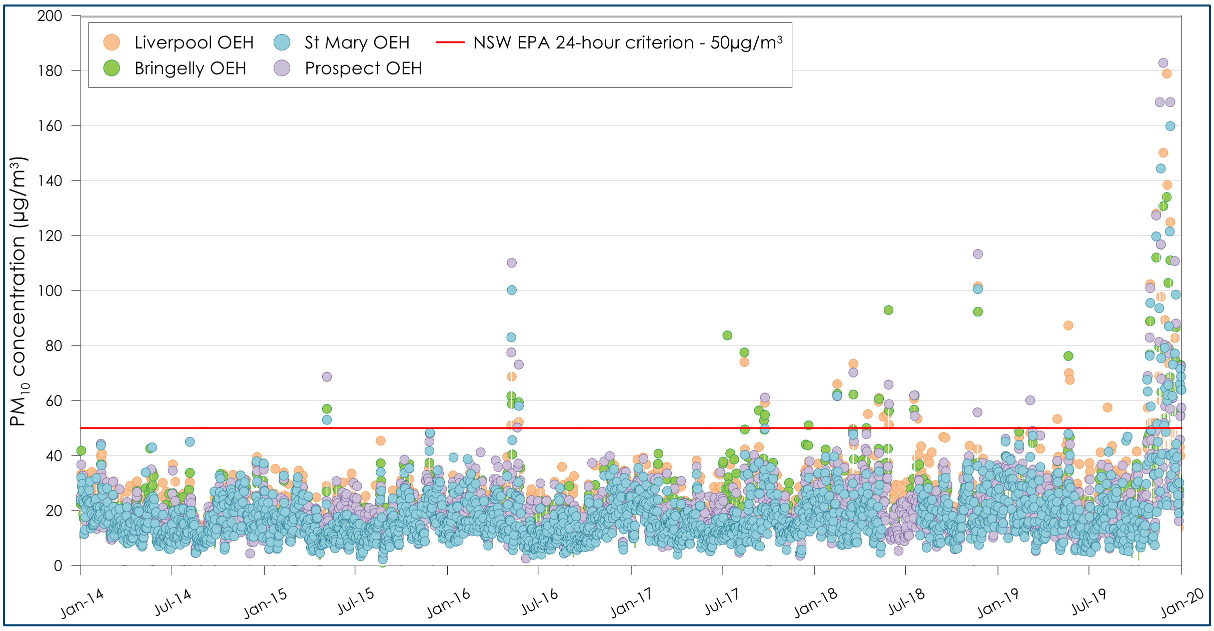

Figure 5-3: 24-hour average PM_{10} concentrations

5.3.1.2 $PM_{2.5}$ monitoring

A summary of the available $PM_{2.5}$ readings from the NSW DPIE monitors is presented in **Table 5-3**. Values above the relevant criterion are presented in bold. The recorded 24-hour average $PM_{2.5}$ concentrations are presented in **Figure 5-4**.

Table 5-3 indicates that the annual average $PM_{2.5}$ concentrations were generally above the relevant criterion of 8µg/m^3 with the exception of Bringelly, St Marys and Prospect in 2017 which were below the criteria. The maximum 24-hour average $PM_{2.5}$ concentrations generally exceeded the relevant criterion of 25µg/m^3 with the exception of Liverpool in 2014.

A small seasonal trend in 24-hour average $PM_{2.5}$ concentrations for the monitoring stations can be seen in **Figure 5-4** with generally more elevated levels occurring in the cooler months. This is opposite to the seasonal trend for PM_{10} concentrations which has elevated levels during the warmer months. As mentioned, the very high $PM_{2.5}$ levels in late 2019 result from widespread NSW bushfires.

Table 5-3: Summary of $PM_{2.5}$ levels from NSW DPIE monitoring (µg/m^3)

Year	Liverpool	Bringelly	St Mary	Prospect	Criterion
	Annual Average				
2014	**8.6**	-	-	-	**8**
2015	**8.5**	-	-	**8.2**	**8**
2016	**8.7**	-	-	**8.7**	**8**
2017	**8.9**	7.5	7	7.7	**8**
2018	**10.1**	**8**	**7.8**	**8.5**	**8**
2019	**12.8**	**11.3**	**9.8**	**11.9**	**8**
	Maximum 24-hour Average				
2014	24.3	-	-	-	**25**
2015	**32.2**	-	-	**29.6**	**25**
2016	**50.8**	21.6	**93.2**	**84.9**	**25**
2017	**56.4**	**52.5**	**38.2**	**30.1**	**25**
2018	**45.4**	**55.6**	**80.5**	**47.5**	**25**
2019	**156**	**178**	**88.3**	**134.1**	**25**
	Data capture (%)				
2014	97.0	0.0	0.0	6.6	-
2015	94.2	0.0	0.0	92.6	-
2016	95.6	47.5	77.0	98.6	-
2017	95.3	94.5	98.6	97.0	-
2018	97.3	98.9	93.7	96.4	-
2019	96.2	98.1	97.3	92.3	-

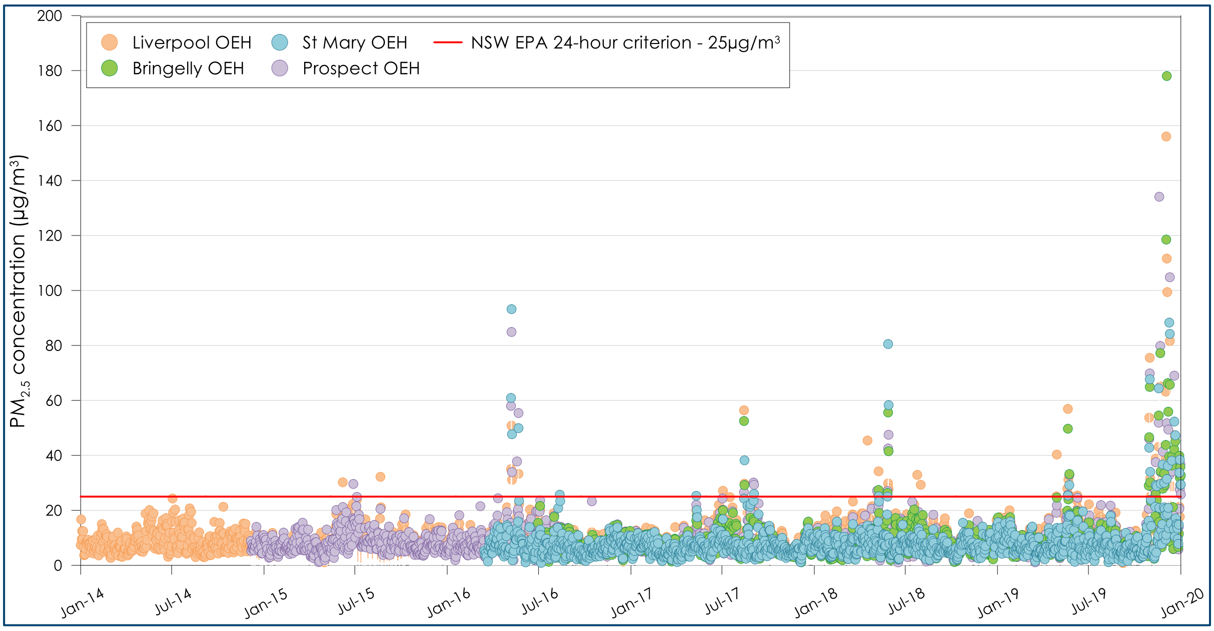

Figure 5-4: 24-hour average $PM_{2.5}$ concentrations

5.3.1.3 Other pollutants

Available monitoring data for pollutants including SO_2, NO_2, CO from the NSW DPIE monitoring stations were reviewed.

A summary of the SO_2 monitoring data available from the NSW DPIE monitoring stations is presented **Table 5-4**. Note that 10-minute average SO_2 concentrations are not available from the NSW DPIE monitoring stations. A review **Table 5-4** indicates that the annual, 1-hour and 24-hour average SO_2 concentrations at the monitoring stations were below the relevant criterion of 60µg/m^3, 228µg/m^3 and 570µg/m^3, respectively.

Table 5-4: Summary of SO_2 levels from NSW DPIE monitoring (µg/m³)

Year	Liverpool	Bringelly	St Mary	Prospect	Criterion
	Annual Average				
2014	-	0.6	-	1.9	**60**
2015	-	0.3	-	1.5	**60**
2016	2.0	0.5	-	1.7	**60**
2017	2.1	0.6	-	2.0	**60**
2018	2.0	1.1	-	2.2	**60**
2019	2.0	1.2	-	2.1	**60**
	Maximum 1-hour Average				
2014	-	25.7	-	54.2	**570**
2015	-	20.0	-	77.0	**570**
2016	20.0	17.1	-	59.9	**570**
2017	31.4	25.7	-	65.6	**570**
2018	57.0	31.4	-	71.3	**570**
2019	45.6	79.8	-	59.9	**570**
	Maximum 24-hour Average				
2014	-	8.6	-	14.3	**228**
2015	-	2.9	-	8.6	**228**
2016	5.7	5.7	-	11.4	**228**
2017	8.6	5.7	-	11.4	**228**
2018	11.4	8.6	-	14.3	**228**
2019	11.4	11.4	-	11.4	**228**
	Data capture (%)				
2014	0.0	65.8	0.0	91.0	-
2015	0.0	49.9	0.0	91.0	-
2016	56.3	66.1	0.0	90.4	-
2017	90.7	74.8	0.0	93.7	-
2018	89.3	89.9	0.0	86.0	-
2019	90.4	88.2	0.0	92.9	-

A summary of the NO_2 monitoring data available from the NSW DPIE monitoring stations is presented **Table 5-5**. A review of **Table 5-5** indicates that the annual and 1-hour average NO_2 concentrations at the monitoring stations were below the relevant criterion of 62µg/m³ and 246µg/m³, respectively.

Table 5-5: Summary of NO_2 levels from NSW DPIE monitoring (µg/m³)

Year	Liverpool	Bringelly	St Mary	Prospect	Criterion
	Annual Average				
2014	20.5	8.2	8.2	20.5	**60**
2015	20.5	8.2	8.2	21.6	**60**
2016	24.6	10.3	8.2	20.5	**60**
2017	24.6	10.3	8.2	20.5	**60**
2018	24.6	12.3	10.3	18.5	**60**
2019	24.6	10.3	8.2	18.5	**60**
	Maximum 1-hour Average				
2014	90.2	51.3	63.6	96.4	**246**
2015	123.0	55.4	65.6	108.7	**246**
2016	96.4	61.5	86.1	108.7	**246**
2017	131.2	73.8	75.9	123.0	**246**
2018	127.1	73.8	75.9	104.6	**246**

2019	102.5	69.7	67.7	100.5	**246**
	Data capture (%)				
2014	98.6	97.8	97.3	98.1	-
2015	97.0	99.2	98.1	99.5	-
2016	99.7	99.7	98.6	99.7	-
2017	99.7	99.2	97.8	100.0	-
2018	99.2	99.2	98.6	91.8	-
2019	100.0	98.6	99.2	99.2	-

A summary of the CO monitoring data available from the NSW DPIE monitoring stations is presented in **Table 5-6**. Note that 15-minute average CO concentrations are not available from the NSW DPIE monitoring stations. A review of **Table 5-6** indicates that the 1-hour average CO concentrations at the monitoring stations were below the relevant criterion of 30,000µg/m^3.

Table 5-6: Summary of CO levels from NSW DPIE monitoring (µg/m³)

Year	Liverpool	Bringelly	St Mary	Prospect	Criterion
	Maximum 1-hour Average				
2014	3,125	-	-	2,625	**30,000**
2015	2,875	-	-	2,375	**30,000**
2016	2,750	-	-	2,000	**30,000**
2017	2,750	-	-	2,000	**30,000**
2018	3,000	-	-	1,625	**30,000**
2019	4,625	-	-	6,875	**30,000**
	Maximum 8-hour Average				
2014	2,750	-	-	1,625	**10,000**
2015	2,250	-	-	1,875	**10,000**
2016	2,375	-	-	1,875	**10,000**
2017	2,250	-	-	1,375	**10,000**
2018	2,375	-	-	1,375	**10,000**
2019	2,250	-	-	3,500	**10,000**
	Data capture (%)				
2014	98.9	0.0	0.0	95.1	-
2015	93.2	0.0	0.0	93.7	-
2016	97.3	0.0	0.0	95.6	-
2017	99.7	0.0	0.0	90.7	-
2018	99.2	0.0	0.0	81.4	-
2019	98.4	0.0	0.0	89.3	-

The recorded 1-hour maximum concentrations for SO_2, NO_2 and CO over a 24-hour period are presented in **Figure 5-5**. It can be seen from **Figure 5-5** that 1-hour maximum SO_2, NO_2, and CO concentrations are below the applicable criteria.

Figure 5-5: 1-hour maximum SO_2 (top), NO_2 (middle) and CO (bottom) concentrations

5.3.2 Proposal monitoring

Ambient air quality monitoring near the proposal was commissioned for a three-month campaign from 23 October 2019 to 23 January 2020.

The following parameters were measured at the air quality monitoring stations:

- Particulate matter (including $PM_{2.5}$ and PM_{10}) via DustTrak monitors; and,
- Gaseous pollutants (including SO_2, NO, NO_2 and CO) via AQMesh monitors.

The two monitoring stations were located on residential properties surrounded by a mix of residential and agricultural land to the south-southwest and southeast of the proposal site as shown in **Figure 5-6**. These locations are likely to be reasonably representative of the most relevant residential areas for assessing the potential impacts from the proposal. Location 1 is approximately 1.1km south-southwest of the Project and Location 2 is approximately 2km south-southeast of the Project.

Figure 5-6: Proposal monitoring locations

The recorded monitoring data were compared with the available monitoring data recorded at the St Marys and Prospect NSW DPIE monitoring stations for the same period as shown in **Appendix B**. The data are directly comparable, other than being recorded in different locations, with differing measurement technology. The accuracy of the monitoring equipment was tested by also operating the monitors for approximately one week at the DPIE Prospect station, where the readings were proven to be suitably similar to the reference standard measurments made by DPIE.

The comparison indicates that the monitoring data recorded at the locations near the proposal are generally consistent with the monitoring data recorded at St Marys and Prospect monitoring stations, and that the measurements are comparable with those taken using reference method monitors. The similarities between the trends in the measured levels at the monitoring sites suggests that these locations are predominantly influenced by regional air quality levels.

5.3.3 Estimated background levels

Monitoring data conducted over the campaign period near the proposal found that ambient air quality levels near the proposal overall had sufficiently good correlation to monitoring data available from the NSW DPIE monitor at Prospect. Thus, monitoring data from the NSW DPIE Prospect site are considered representative of the area surrounding the proposal site and have been used to represent the background levels for the proposal.

Of the available data, the Prospect monitor provides a sufficient dataset for 2015 and would present a conservative estimate of background levels for the proposal site to assess the cumulative impacts and thus has been selected for this assessment. The measured background levels for the 2015 calendar year period correspond to the representative year of weather data for the meteorological modelling as outlined in **Appendix A**.

5.3.3.1 $PM_{2.5}$ and PM_{10} concentrations

Maximum 24-hour average and annual average $PM_{2.5}$ and PM_{10} values from the NSW DPIE Prospect monitoring station for the 2015 calendar year were used to represent the background levels for the proposal (**Table 5-2** and **Table 5-3**).

It is noted that the annual average $PM_{2.5}$ concentration at the Prospect monitor was above the relevant criteria of $8\mu g/m^3$. The other monitors reviewed for the 2015 calendar year were either also above the relevant criteria or did not have available data.

5.3.3.2 TSP and Deposited Dust

In the absence of available data, estimates of the annual average background TSP and deposited dust concentrations can be determined from the relationship between $PM_{10,}$ TSP and deposited dust concentration criteria and the measured PM_{10} levels.

This assumes that an annual average PM_{10} concentration of $25\mu g/m^3$ corresponds to a TSP concentration of $90\mu g/m^3$ and a dust deposition value of $4g/m^2$/month. This assumption is based on the NSW EPA air quality impact criteria.

Applying this to the measured annual average PM_{10} concentration of $17.6\mu g/m^3$ indicates an approximate annual average TSP concentration and deposition value of $63.4\mu g/m^3$ and $2.8g/m^2$/month, respectively.

5.3.3.3 Gaseous pollutants concentrations

Maximum 1-hour average CO and SO_2 concentrations and maximum 24-hour averages and annual average SO_2 and NO_2 concentrations from the NSW DPIE Prospect monitoring station for the 2015 calendar year were used to represent the background levels for the proposal (see **Table 5-4**, **Table 5-5** and **Table 5-6**).

5.3.3.4 Summary of background levels

The background air quality levels applied in this assessment are as follows:

- Maximum 24-hour $PM_{2.5}$ concentrations – daily varying;
- Annual average $PM_{2.5}$ concentrations – 8.2µg/m^3;
- Maximum 24-hour PM_{10} concentrations – daily varying;
- Annual average PM_{10} concentrations – 17.6µg/m^3;
- Annual average TSP concentrations – 63.4 µg /m^3;
- Annual average Deposited dust levels – 2.8g/m^2/month;
- Maximum 1-hour CO concentrations – 2,375 µg /m^3;
- Maximum 1-hour SO_2 concentrations – 77.0 µg/m^3;
- Maximum 24-hour SO_2 concentrations – 8.6 µg /m^3;
- Annual average SO_2 concentrations – 1.5 µg /m^3;
- Maximum 1-hour NO_2 concentrations – 108.7 µg /m^3; and,
- Annual average NO_2 concentrations – 21.6 µg /m^3.

It is noted that the predicted impacts from the Next Generation Energy from Waste Facility have also been included in this assessment (in addition to the existing measured background levels) to account for the potential future changes in the background air quality levels when determining the cumulative total impacts in future years.

Cumulative impacts in relation to other projects have been considered in **Section 6.10** below.

6 DISPERSION MODELLING APPROACH

6.1 Introduction

The following sections are included to provide the reader with an understanding of the model and modelling approach applied for the assessment.

CALPUFF is an advanced "puff" air dispersion model which can deal with the effects of complex local terrain on the dispersion meteorology over the entire modelling domain in a three-dimensional, hourly varying time step. The model setup used is in general accordance with methods provided in the NSW EPA document *Generic Guidance and Optimum Model Setting for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia'* (**TRC, 2011**).

This assessment has considered a Level 2 meteorological modelling technique using worst-case Level 1 emissions input data for the air dispersion assessment as per New South Wales (NSW) Environment Protection Authority (EPA) document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2017**) to evaluate potential regulatory and community concerns in relation to the proposal on the receiving environment.

As per the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2017), if a Level 1 assessment is adequate if it can demonstrate that adverse impacts will not occur. For this reason, more realistic but generally much lower levels of emissions were not explicitly modelled.

6.2 Modelling methodology

Modelling was undertaken using a combination of the CALPUFF Modelling System and The Air Pollution Model (TAPM). The CALPUFF Modelling System includes three main components: CALMET, CALPUFF and CALPOST and a large set of pre-processing programs designed to interface the model to standard, routinely available meteorological and geophysical datasets. TAPM is a prognostic air model used to simulate the upper air data for CALMET input.

6.2.1 Meteorological modelling

The centre of analysis for TAPM was 33deg49.0min south and 150deg51.0min east. The simulation involved an outer grid of 30 km, with three nested grids of 10 km, 3 km and 1 km with 35 vertical grid levels. The CALMET initial domain was run on a 30 x 30km grid with a 0.6km grid resolution and refined for a final domain of 12 x 10km with a 0.1km grid resolution.

The available meteorological data for January 2015 to December 2015 from nearby meteorological monitoring sites were included in the simulation. The 2015 calendar year was selected as the meteorological year for the dispersion modelling based on analysis of long-term data trends in meteorological data recorded for the area as outlined in **Appendix A**.

Table 6-1 outlines the parameters used from each station.

Table 6-1: Surface observation stations used in modelling

Weather Stations	Parameters						
	WS	WD	CH	CC	T	RH	SLP
Horsley Park Equestrian Centre AWS (BoM) (Station No. 067119)	✓	✓			✓	✓	
Badgerys Creek AWS (BoM) (Station No. 067108)	✓	✓			✓	✓	✓
Bankstown Airport AWS (BoM) (Station No. 066137)	✓	✓	✓	✓	✓	✓	✓
Penrith Lakes AWS (BoM) (Station No. 067113)	✓	✓			✓	✓	
Holsworthy Aerodome (BoM) (Station No. 066161)	✓	✓	✓	✓	✓	✓	✓
Sydney Olympic Park AWS (Archery Centre) (BoM) (Station No. 066212)	✓	✓			✓	✓	
Prospect (NSW DPIE)	✓	✓			✓	✓	
St Marys (NSW DPIE)	✓	✓			✓	✓	
Bringelly (NSW DPIE)	✓	✓			✓	✓	
Liverpool (NSW DPIE)	✓	✓			✓	✓	
Chullora (NSW DPIE)	✓	✓			✓	✓	
Vineyard (NSW DPIE)	✓	✓			✓	✓	

WS = wind speed, WD= wind direction, CH = cloud height, CC = cloud cover, T = temperature, RH = relative humidity and SLP = station level pressure.

The seven critical parameters used in the CALMET modelling are presented in **Table 6-2**.

Table 6-2: Seven critical parameters used in CALMET

Parameter	Value
TERRAD	10
IEXTRP	-4
BIAS (NZ)	-1, -0.5, -0.25, 0, 0, 0, 0, 0
R1 and R2	6, 6 (inner domain)
	8, 8 (outer domain)
RMAX1 and RMAX2	8, 8 (inner domain)
	10, 10 (outer domain)

The outputs from the CALMET modelling are evaluated using visual analysis of the wind fields and extracted data and through a comparison of the CALMET generated data at locations with measured observational meteorological data within the modelling domain.

Figure 6-1 presents a visualisation of the wind field generated by CALMET for a single hour of the modelling period. The wind fields are seen to follow the terrain well and indicate the simulation produces realistic fine scale flow fields (such as terrain forced flows) in surrounding areas.

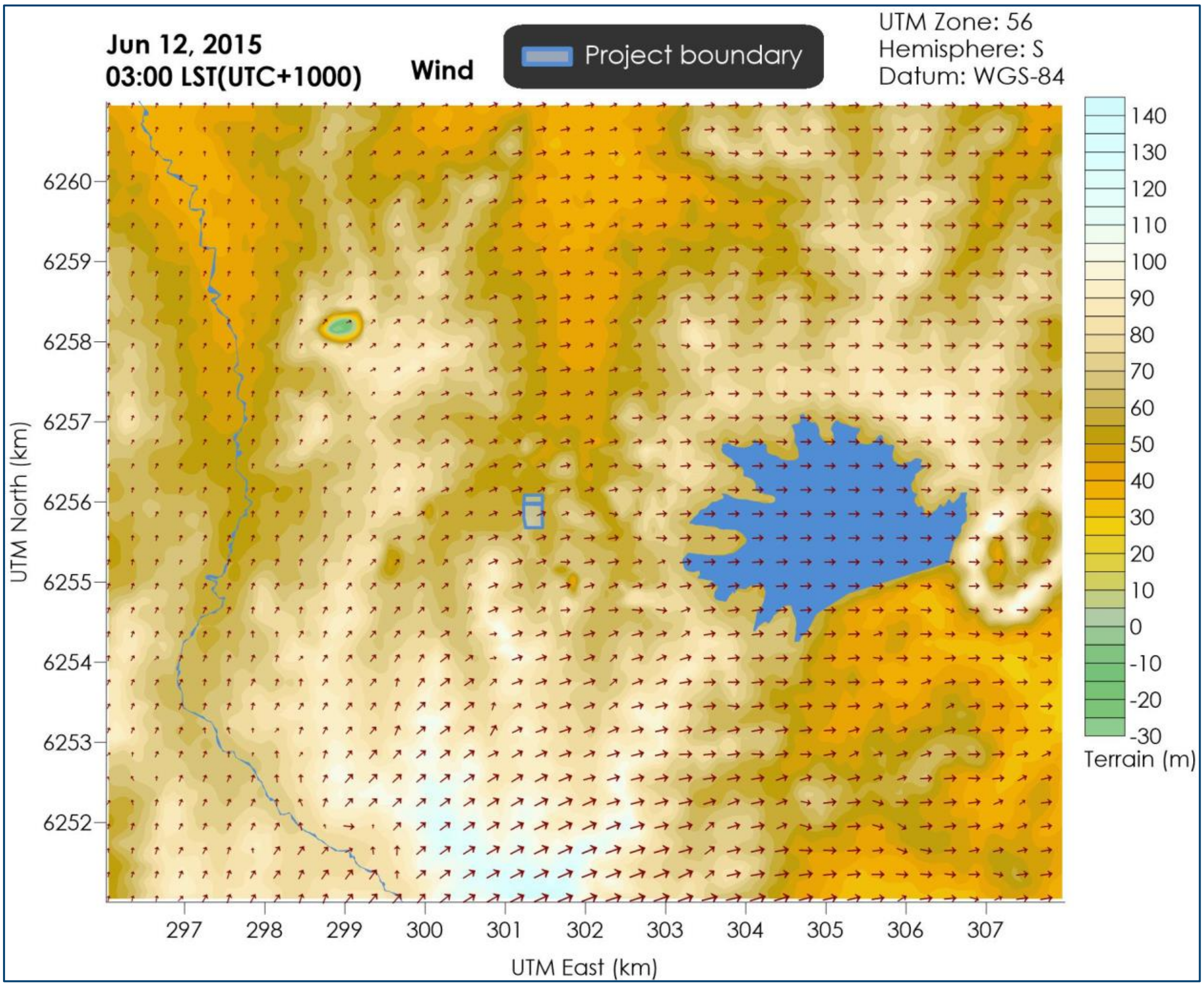

Figure 6-1: Representative snapshot of wind field for the proposal

CALMET generated meteorological data were extracted from a point within the CALMET domain and are graphically represented in **Figure 6-3** and **Figure 6-4**.

Figure 6-3 presents the annual and seasonal windroses from the CALMET data. Overall, the windroses generated in the CALMET modelling reflect the expected wind distribution patterns of the area as determined based on the available measured data and the expected terrain effects on the prevailing winds. **Figure 6-4** includes graphs of the temperature, wind speed, mixing height and stability classification over the modelling period and show sensible trends considered to be representative of the area.

6.2.2 Building wake effects

Building wake effects for the proposal and surrounding buildings were considered in the dispersion modelling using the BPIP-PRIME model as per the design layout and shown schematically in **Figure 6-2** below. The proposal structures and the major nearest buildings were included in this modelling.

Figure 6-2: Schematic of buildings considered in assessing wake effects in the modelling

6.2.3 NO_x conversion

The NSW EPA's Janssen Method (NO to NO_2 conversion using empirical relationship) "Level 2 assessment - Contemporaneous Impact and Background" approach has been applied to estimate the NO_X to NO_2 conversion ratio at all locations in the domain to assess potential incremental and cumulative impacts for 1-hour average and annual average NO_2 concentrations in accordance with the NSW EPA Approved Methods.

The same approach was applied to assess the potential effects of the Next Generation Energy from Waste Facility with ambient (background) NO_2 concentration data corresponding with the year of modelling (2015) from the NSW OEH monitoring site at Prospect.

The cumulative results presented in this assessment thus include the predicted pollutant levels from this proposal, the Next Generation proposal and the DPIE Prospect monitoring data which represent the prevailing background levels in the vicinity of the proposal and at representative receptor locations surrounding the proposal.

Cumulative impacts in relation to other projects have been considered in **Section 6.10** below.

Further detail regarding the contemporaneous NO_2 assessment is provided in **Appendix E**.

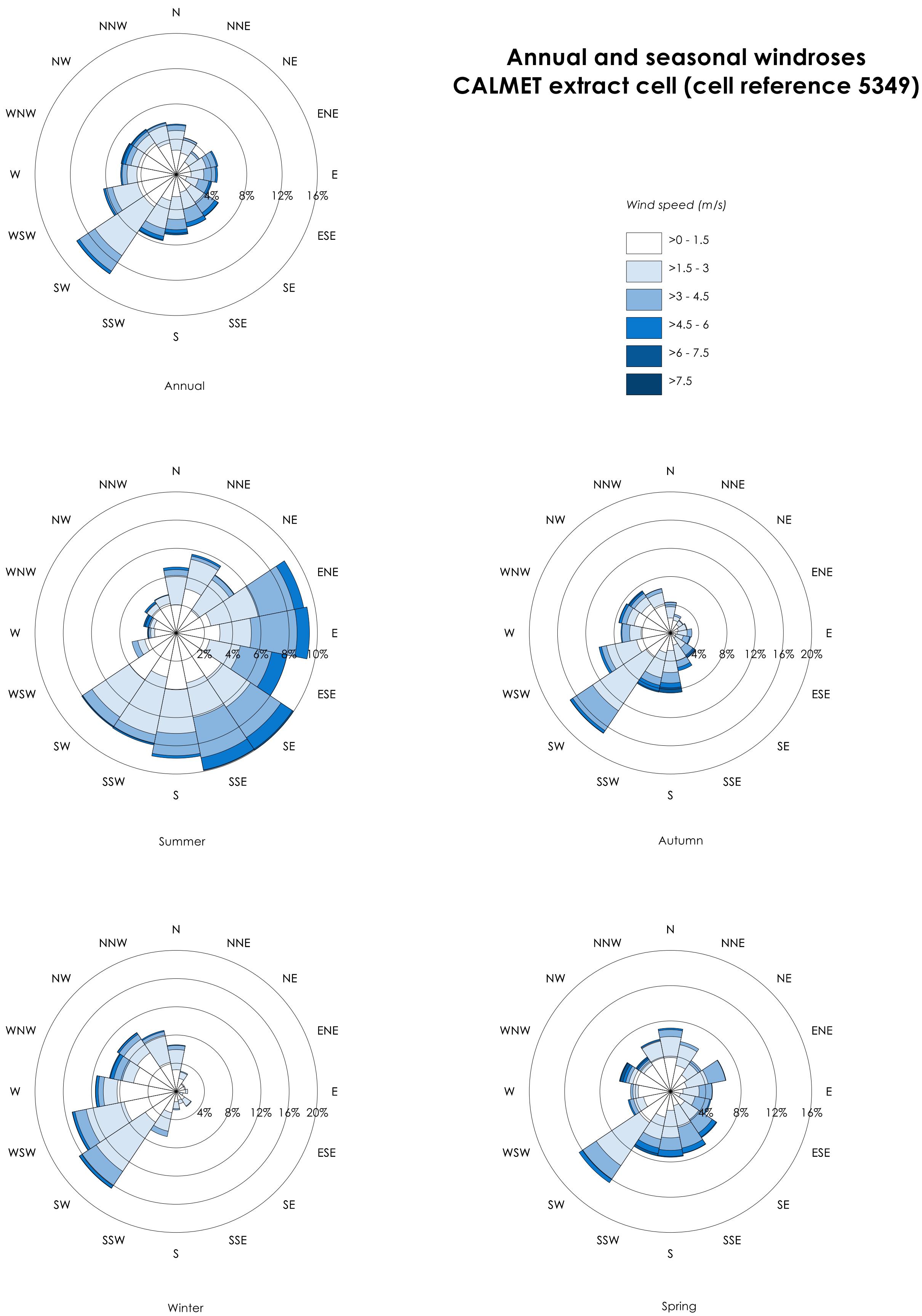

Figure 6-3: Annual and seasonal windroses from CALMET (Cell Ref 5349)

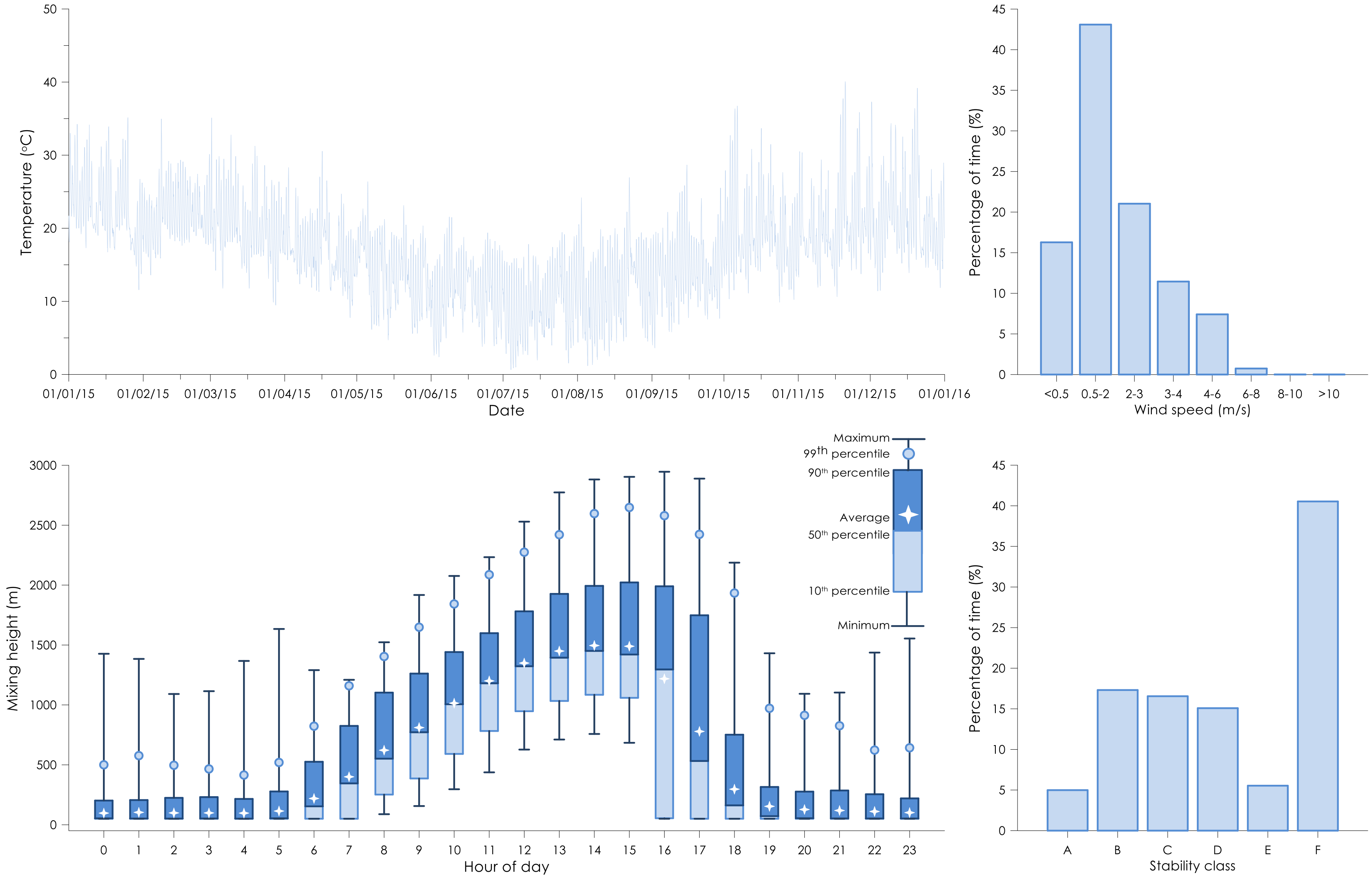

Figure 6-4: Meteorological analysis of CALMET (Cell Ref 5349)

6.3 Dispersion modelling

Air dispersion modelling of the likely air emission sources identified for the proposal was conducted to predict potential air quality impacts in the surrounding environment.

Modelling of the key air emission sources was conducted using the emissions rates and parameters outlined in the following section and the meteorological data described in the previous section.

6.4 Modelling scenarios

As outlined in **Section 3.2** the proposal has capacity to operate within nine different load points. This assessment considered each load point to develop five modelling scenarios for the proposal. These include:

- Scenario 1- Represents the maximum annual average regulatory limit emissions to be released from the stack (comprising two flues) at the design point operating conditions (LP1). The scenario evaluates annual average impacts.

- Scenario 2 - Represents the maximum 24-hour average regulatory limit emissions to be released from the stack (comprising two flues) at the design point operating conditions (LP1), and at the most impacting load point operational condition at any location, in any hour of the year. The scenario evaluates the expected maximum 24-hour average impacts and is consistent with the upper range of the best practice achievable emission limits (BAT-AELs).

- Scenario 3 - Represents the maximum 1-hour average regulatory limit emissions to be released from the stack (comprising two flues) at the design point operating conditions (LP1), and at the most impacting load point condition at any location, in any hour of the year. The scenario models the maximum 1-hour emissions under the worst case operating load and air dispersion conditions to quantify the maximum short term 1-hour and 24-hr average impacts.

- Scenario 4 - The scenario evaluates worst case upset conditions and the upper range of potential impacts at the proposed licence limits, at the most impacting load point condition at any location, in any hour of the year. The scenario conservatively assumes maximum hourly emissions are generated for 24-hours.

An additional scenario (EPA Limit modelling scenario) was also modelled. The scenario conservatively assumes maximum regulatory limit hourly emissions at all hours of the year to be released from the stack (comprising two flues) at the design point operating conditions (LP1). It is noted that this scenario cannot actually occur, and has been modelled to conservatively estimate hypothetical maximum impacts for a regulatory limit scenario.

Table 6-3 below presents a summary of the modelled scenarios. The LP1 case represents the stack discharge condition expected for the great majority of the time. The LPmax case takes the highest impacting result of any LP1 to LP9 case in each hour modelled at each point assessed. In essence it represents the hypothetical most impacting possible means of running the plant in every hour of the year at every location.

Table 6-3: Modelling scenarios

Scenario	1-hr		24-hr		AA	
	LP1	Max LP	LP1	Max LP	LP1	Max LP
SC1 - Regulatory Limit AA					✓	
SC2 - Regulatory Limit 24-hr			✓	✓		
SC3 - Regulatory Limit 1-hr	✓	✓				
SC4 - Worst-case upset		✓		✓*		
EPA Limit - Regulatory 1-hour limits, all hours of the year	✓		✓*		✓*	

* assumes maximum hourly emissions are generated every hour for 24-hours, or all hours of the year

The stack parameters considered in the dispersion modelling scenarios for the various different load points for a single line are summarised below in **Table 6-4**.

Table 6-4: Emission source parameters for single line

Parameter	Exit velocity (m/s)	Exit temp. (K)	Flow rate (Nm^3/s)	Flow rate (Am^3/s)
LP1	20.9	334	189,630	236,435
LP2	22.1	336	194,410	249,569
LP3	23.6	335	211,255	266,563
LP4	21.3	331	201,839	241,104
LP5	19.4	331	183,490	219,185
LP6	17.6	331	166,976	199,459
LP7	14.6	334	132,741	165,504
LP8	16.2	337	139,062	182,863
LP9	19.4	337	166,874	219,436

Nm^3/s = reference gas flow, dry at 11% O_2.
Am^3/s = actual gas flow, wet, corrected for temperature

Each flue line has a diameter of 2m and a height of approximately 75 metres (m) ± 5m. It is noted that a difference in stack height of ±5m is unlikely to have any tangible effect on the emissions. Emissions are released from both identical flue lines and emitted via a common stack structure.

As there is less impact from only one flue, only the combined flue case is presented. The assessment modelled a combined flue with an equivalent diameter of 2.8m at a stack height of 75m, giving the same discharge parameters as both flues to represent emission points from both flue lines in the common stack structure. The stack parameters considered in the dispersion modelling scenarios for the various different load points LP1 to LP9 are summarised below in **Table 6-5**. Modelled emissions are assumed to be emitted constantly.

Table 6-5: Emission source parameters for the combined stack

Parameter	Exit velocity (m/s)	Exit temp. (K)	Flow rate (Nm^3/s)	Flow rate (Am^3/s)
LP1	20.9	334	379,260	472,869
LP2	22.1	336	388,820	499,137
LP3	23.6	335	422,510	533,126
LP4	21.3	331	403,678	482,208
LP5	19.4	331	366,980	438,371
LP6	17.6	331	333,952	398,918
LP7	14.6	334	265,482	331,009
LP8	16.2	337	278,124	365,726
LP9	19.4	337	333,749	438,871

6.5 Modelled Emissions

The maximum in-stack design emission concentrations for the proposal are outlined in **Table 6-6** and are developed on the basis that with the pollution control systems in place, these are the levels that can be met by the plant in full operation. The emissions for 1-hour and 24-hour averaging periods are per the **EU IED (2010)** values and the BAT-AELs, given that these are the benchmarks used for the plant design, and all installations containing combustion plants should not exceed the emissions limits from the emission limit values. The annual average levels are based on expected long term average levels for the proposed plant and pollution controls.

Please note that the modelling is based on 1-hour average periods, and it is conservatively assumed that the ½ hour design value would be emitted for a full hour (whereas the actual 1-hour average value may be approximately 12.5% lower than the ½ hour value). Furthermore, this is assumed to be the case for the stack average of the two flues within the stack, adding further conservatism in the modelling.

Table 6-6: Design/ Modelled stack emission concentrations

Pollutant	Units	Design/Modelled concentrations		
		Max 1/2-hour average[(1)]	Max 24-hour average[(2)]	Annual Average
CO [(3)]	mg/Nm^3	100	50	20
TOC (VOC) [(4)]	mg/Nm^3	20	10	2
$PM_{2.5}$	mg/Nm^3	28.5	4.8	1.9
PM_{10}	mg/Nm^3	29.4	4.9	2.0
TSP	mg/Nm^3	30	5	2
HCl	mg/Nm^3	60	6	2
HF	mg/Nm^3	4	1	0.4
$SO_2 + SO_3$	mg/Nm^3	200	30	5
NO_x (calculated as NO_2)	mg/Nm^3	400	120	90
NH3	mg/Nm^3	30	10	2
Hg	mg/Nm^3	0.035	0.02	0.005
Cd+Tl	mg/Nm^3	0.02[(5)]	-	0.0005
Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V	mg/Nm^3	0.3[(5)]	-	0.1
Dioxins	ng/Nm^3	0.06	0.06	0.06

(1) The ½ hour max design level is conservatively modelled as a 1 hour average maximum concentration at design reference conditions, per IED emission limit value, column A. (Note that maximum actual 1 hr, ave. may be ~12.5% lower than the maximum design level, e.g. for NO_2 the maximum actual 1-hr ave. level expected to be emitted is $\leq$ 350 mg/m^3, vs. the maximum ½hr ave. design level of $\leq$ 400 mg/m^3, see **Table 6-7**)

(2) 24-hour emission limit according to **EU Commission for WI, 2019**

(3) CO is a surrogate for VOC, and is thus not modelled

(4) TOC taken to be a surrogate for the VOC subset of the TOC

(5) Spot sampling, average of three samples each obtained for at least ½ hour

Note that the Total Suspended Particulates (TSP) emissions are assumed to comprise of 98% PM_{10} and 95% $PM_{2.5}$, based on the available stack testing report data for the reference facility in Dublin, outlined in more detail below.

6.5.1 Comparison of expected regulatory limit emission levels with the International air emission limits

Table 6-7 presents the expected maximum in-stack concentrations, reflecting the expected licence limits, in comparison with the IED, BAT-AELs and the POEO emission limits on a like for like basis. (The modelled values may be more conservative (higher) than the expected licence limits and are presented in **Table 6-6**).

The expected maximum in-stack concentrations are all below or equal to the most stringent emission limit at the relevant averaging period and the design reference conditions, except for the 1-hour dioxins in-stack concentration. Interestingly, it appears that there may be an error in the very recently published IED, BAT-AELs for dioxins in that they have a lower level 0.04 ng/Nm^3 for short term spot sampling (typically 6 to 8 hours) relative to the longer sampling period (typically 2 to 4 weeks). (For conservatism in the modelling in this assessment, the higher value, 0.06 ng/Nm^3 has been assumed as a 1-hour in-stack concentration).

It is also noted that whilst conservative relative to likely actual emissions (see **Table 6-10**), the modelled in-stack concentrations comply with the concentration standards in the POEO (Clean Air) Regulation.

It is noted that the POEO (Clean Air) Regulation (the Regulation) reference conditions can be set at any level by the EPA. In general, nil reference conditions or the default reference conditions in the Regulation may be set for common plant types, especially when the design reference conditions are unknown, but for specialised plant it is usual for any reference conditions to be set per the nominal plant design specifications. It is assumed that the EPA would therefore set the reference conditions per the nominal plant design specifications for this plant.

The nominal plant design specifications for the plant are per the European IED and BAT-AELs reference conditions. These are different to the default reference conditions in the Regulation, which for any fuel burning equipment using solid fuel are a 7% oxygen (O_2) reference condition (except for dioxins which has an 11% O_2 reference condition), whereas the IED and BAT-AELs have an 11% O_2 reference condition for all pollutants.

Whilst the nominal design specifications for the plant are for an oxygen reference level of 11% O_2 it is noted that the reference plant operational O_2 level is 7.1% and that the designers indicate the WSERRC plant is likely to have actual operational oxygen levels of approximately 8.5%, but this cannot be exactly specified until the final plant manufacturer is selected

Table 6-7 presents a comparison of IED, BAT-AELs and the POEO emission limits (at the assumed design 11% O_2 level (i.e. uncorrected), and also if assuming the default 7% O_2 level is applied, and then is converted to an 11% O_2 level). At the time of preparing this report, it was only possible to confirm that the 1-hour average NO_2 concentration would be approximately 12.5% less than the ½ hour average concentration, but it is likely that the actual 1-hour average concentrations of the other pollutants as shown as ½ hour levels would in practice be lower. Despite this, the comparison shows that all modelled design in-stack concentrations are below the Regulation limits (even if assuming the default 7% O_2 level is applied, and then is converted to an 11% O_2 level). It is noted that CO is a defector for VOC, which complies with the Regulation limits irrespective of how any reasonable reference conditions are applied.

Table 6-7: Comparison of expected emissions and international air emission limits

Pollutant	Units	1-hour averages				24-hour averages				Annual averages			
		Expected stack emission*	IED(1)	BAT-AELs (upper limit)(2)	POEO(3)	Expected stack emission	IED(1)	BAT-AELs (upper limit)(2)	POEO(3)	Expected stack emission	IED(1)	BAT-AELs (upper limit)(2)	POEO(3)
TOC (VOC)	mg/m3	≤ 20	20	-	40(29)	≤ 10	10	10	-	≤ 2	-	-	-
Dust	mg/m3	≤ 30	30	-	50(36)	≤ 5	10	5	-	≤ 2	-	-	-
$PM_{2.5}$	mg/m3	≤ 28.5	-	-	-	≤ 4.8	-	-	-	≤ 1.9	-	-	-
PM_{10}	mg/m3	≤ 29.4	-	-	-	≤ 4.9	-	-	-	≤ 2.0	-	-	-
HCl	mg/m3	≤ 60	60	-	100(71)	≤ 6	10	6	-	≤ 2	-	-	-
HF	mg/m3	≤ 4	4	-	-	≤ 1	1	1	50(36)	≤ 0.4	-	-	-
SO_2 + SO_3	mg/m3	≤ 200	200	-	-	≤ 30	50	30	-	≤ 5	-	-	-
NOx (calculated as NO_2)	mg/m3	≤ 350	400	-	500(**357**)	≤ 120	200	120	-	≤ 90	-	-	-
NH_3	mg/m3	≤ 30	-	-	-	≤ 10	-	10	-	≤ 2	-	-	-
Hg	mg/m3	≤ 0.035	0.05	0.035	0.2(0.14)	≤ 0.02	-	0.02(4)	-	≤ 0.005	-	0.01(5)	-
Cd+Tl	mg/m3	≤ 0.02	0.05	0.02(4)	-	-	-	-	-	≤ 0.0005	-	-	-
Cd	mg/m3	-	-	-	0.2(0.14)	-	-	-	-	-	-	-	-
Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V	mg/m3	≤ 0.3	0.5	0.3(4)	-	-	-	-	-	≤ 0.1	-	-	-
Dioxins	ng/m3	≤ 0.06	-	0.04(4)	0.1	≤ 0.06	0.1	-	-	≤ 0.06	-	0.06(5)	-
Type 1 and Type 2 metals(6)	mg/m3	-	-	-	1(0.71)	-	-	-	-	-	-	-	-

* ½ hour IED design value conservatively modelled as 1-hr ave. (actual 1 hr, ave. is ~12.5% lower than the design level, e.g. for NO_2 the 1-hr ave. level emitted is 350 mg/m^3, vs. the ½hr ave. design level of 400 mg/m^3)

(1) European Union Industrial Emissions Directive 2010/75/EU – Air Emission Daily Limit Values

(2) Commission Implementing Decision (EU) 2019/2010 Of 12 November 2019 Establishing The Best Available Techniques (BAT) Conclusions, Under Directive 2010/75/Eu Of The European Parliament And Of The Council, For Waste Incineration (**EU Commission for WI, 2019**) (*).

(3) Protection of the Environment Operations (Clean Air) Regulation 2010 – Group 6 [POEO], Sampling period of 1 hour or the minimum sampling period specified in the relevant test method referred to in the POEO. HF has a sampling period over a daily average, 11% O_2(assuming O_2 ref of 7% is then converted to 11% O_2).

(4) Average over the sample period – Hg measurement taken from continuous measurements. Metals (Cd+Tl, Hg, Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V) have sampling period of a minimum 30 minutes and a maximum of 8 hours. Dioxins and furans have a sampling period of a minimum 6 hours and a maximum of 8 hours (*).

(5) Long-term sampling period average – Hg long-term sampling period of 2-4 weeks (*).

(6) Type 1 metals include Sb + As + Cd + Pb + Hg, Type 2 metals include Be + Cr + Co + Mn + Ni + Se + Sn + V.

(*) It is noted that the long term criteria for dioxins are less stringent than the short term criteria in Table 7 in the newly released (**EU Commission for WI, 2019**), hence it appears that the averaging periods have been inadvertently switched in the table.

6.5.2 Beryllium, Selenium and Tin

It is understood that beryllium, selenium and tin are not monitored regularly at the Dublin reference facility and the available data indicate levels below the detection limit.

Whilst there is very limited data available for beryllium emissions from waste facilities, the few instances where testing was conducted shows that no emissions were detected. This indicates that beryllium is a relatively rare substance, or at least it is rarely regulated or considered internationally. It is understood to have affected workers directly exposed to high levels in a munitions factory in the US, which is not comparable to the proposal.

Beryllium data has been sourced from the *Air Quality Impact Assessment and Mitigation Report Sims Recycling Villawood* (**Todoroski Air Sciences, 2016**) from stack testing results for the emissions from a high speed shredder processing waste materials. It is recognised that the two processes (combustion and shredding) are different, however on balance it is considered that these data provide a reasonable, general estimate of actual measured emissions of beryllium originating from the processing of waste in Sydney, and are considered to be more informative than using the limited "non-detect" results that can be otherwise obtained.

Emissions of Selenium and Tin have been estimated from the emission factors in the *Emission from Decentralised CHP Plants 2007* (**NERI, 2010**). The emissions factors are based on actual measured data from such plants.

The assessment has assumed the concentrations for beryllium, selenium and tin as set out in **Table 6-8** below when modelling any potential impacts.

Table 6-8: Stack emission concentrations for beryllium, selenium and tin

Pollutant	Units	Modelled concentrations		
		Max 1-hour average	Max 24-hour average	Annual Average
Beryllium (Be)	mg/Nm^3	0.00084	-	-
Selenium (Se)	mg/Nm^3	0.022	-	-
Tin (Sb)	mg/Nm^3	0.021	-	-

6.5.3 Emission rates

The emission rates adopted for modelling of each LP are derived from the design maximum in-stack emission concentrations and the flow rate per LP for the combined stack to represent emissions via a combined flue. **Table 6-9** below presents the emissions rates used in this assessment.

Table 6-9: Emission rates at each operational load point (g/s)

Pollutant	LP1	LP2	LP3	LP4	LP5	LP6	LP7	LP8	LP9
	1-hour emission rates (g/s)								
CO	10.54	10.80	11.74	11.21	10.19	9.28	7.37	7.73	9.27
TOC	2.11	2.16	2.35	2.24	2.04	1.86	1.47	1.55	1.85
HCl	6.32	6.48	7.04	6.73	6.12	5.57	4.42	4.64	5.56
$SO_2 + SO_3$	21.07	21.60	23.47	22.43	20.39	18.55	14.75	15.45	18.54
NO_X (as NO_2)	42.14	43.20	46.95	44.85	40.78	37.11	29.50	30.90	37.08
NH_3	3.16	3.24	3.52	3.36	3.06	2.78	2.21	2.32	2.78
Hg	3.69E-03	3.78E-03	4.11E-03	3.92E-03	3.57E-03	3.25E-03	2.58E-03	2.70E-03	3.24E-03
Cd+Tl	2.11E-03	2.16E-03	2.35E-03	2.24E-03	2.04E-03	1.86E-03	1.47E-03	1.55E-03	1.85E-03
Metals(1)	3.16E-02	3.24E-02	3.52E-02	3.36E-02	3.06E-02	2.78E-02	2.21E-02	2.32E-02	2.78E-02
Dioxins	6.32E-09	6.48E-09	7.04E-09	6.73E-09	6.12E-09	5.57E-09	4.42E-09	4.64E-09	5.56E-09
Be	8.85E-05	9.07E-05	9.86E-05	9.42E-05	8.56E-05	7.79E-05	6.19E-05	6.49E-05	7.79E-05
Se	2.33E-03	2.39E-03	2.59E-03	2.48E-03	2.25E-03	2.05E-03	1.63E-03	1.71E-03	2.05E-03
Sn	2.20E-03	2.26E-03	2.45E-03	2.34E-03	2.13E-03	1.94E-03	1.54E-03	1.61E-03	1.94E-03
	24-hour emission rates (g/s)								
$PM_{2.5}$	0.50	0.51	0.56	0.53	0.48	0.44	0.35	0.37	0.44
PM_{10}	0.52	0.53	0.58	0.55	0.50	0.45	0.36	0.38	0.45
HF	0.11	0.11	0.12	0.11	0.10	0.09	0.07	0.08	0.09
$SO_2 + SO_3$	3.16	3.24	3.52	3.36	3.06	2.78	2.21	2.32	2.78
	Annual average emission rates (g/s)								
$PM_{2.5}$	0.20	-	-	-	-	-	-	-	-
PM_{10}	0.21	-	-	-	-	-	-	-	-
TSP	0.21	-	-	-	-	-	-	-	-
Deposition	0.21	-	-	-	-	-	-	-	-
$SO_2 + SO_3$	0.53	-	-	-	-	-	-	-	-
NO_X (as NO_2)	9.48	-	-	-	-	-	-	-	-

(1) Metals include the sum of nine metals, i.e. Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V

6.5.4 Comparative emissions levels from the Dublin Reference facility

The Dublin Waste to Energy facility was selected as the reference facility for the proposal as it has a similar modern design and processes similar types of waste at a similar rate. Details regarding the waste streams of the proposal in comparison with the Dublin Reference Facility are examined in the Technical Report C Waste and Resource Management Assessment.

The measured stack emission concentrations for the Dublin Waste to Energy reference facility are available from stack testing reports, and have been summarised in **Table 6-10**. The stack testing reports are approximately 3,000 pages in total and have been provided in electronic form directly to the NSW EPA for their review.

Table 6-10 presents the average and maximum in-stack concentration limits measured for each line at the Dublin Waste to Energy reference facility in comparison with the BAT-AELs and IED emission limits. Note that the BAT-AELs are only valid for daily average emissions or the relevant spot sampling period, and that the notes below the table set out the averaging periods for the Dublin facility data.

The in-stack concentrations at the reference facility are all below the BAT-AELs with the exception of NO_x (as NO_2). It is noted that stack testing measurements for NO_x (as NO_2) in Dublin are sampled over a 30-minute period and thus the daily average NO_x BAT-AEL does not apply to the presented 30-minute value. However, the ½ hour maximum **IED (2010)** emission limit of 400mg/Nm^3 can be reasonably compared, and it can be seen that even the maximum NO_x emissions from the Dublin Waste to Energy reference facility are near to half the IED limit.

Note also that in-stack concentrations are all within the Dublin facility's own in-stack concentration limits. It is understood that at present the Dublin facility is not required to comply with the BAT-AELs. With minimal additional NO_x mitigation measures (i.e. increased use of dosing consumables) the Dublin facility can comply with the NO_x BAT-AELs once it is required to.

The expected regulatory limit emissions used for modelling the proposal include an allowance for normal plant performance degradation over time to ensure the proposal is capable of continually achieving the modelled regulatory emission limits. The modelled values overestimate the measured emissions from the Dublin Waste to Energy reference facility.

Table 6-10: Summary of Dublin Waste to Energy facility in-stack concentrations

Pollutant	Units	Line 1		Line 2		BAT-AELs Upper Limit	IED[3]	Dublin In-stack limit
		Ave.[1]	Max[2]	Ave.[1]	Max[2]			
CO	mg/m^3	6.37[6]	11.47[6]	9.69[6]	15.03[6]	**50**	**100**	**100**
TOCs (as Carbon)	mg/m^3	0.27[6]	0.34[6]	0.54[6]	1.35[6]	**10**	**20**	**20**
TSP	mg/m^3	0.43[7]	0.95[7]	0.62[7]	1.25[7]	**5**	**30**	**30**
PM_{10}	mg/m^3	0.16[8]	0.34[8]	0.17[8]	0.34[8]			
$PM_{2.5}$	mg/m^3	0.15[8]	0.29[8]	0.16[8]	0.37[8]			
HCl	mg/m^3	0.02[7]	0.03[7]	0.02[7]	0.04[7]	**6**	**60**	**60**
HF	mg/m^3	0.11[6]	0.42[6]	0.12[6]	0.50[6]	**<1**	**4**	**4**
SO_2	mg/m^3	7.36[6]	24.62[6]	6.33[6]	19.80[6]	**30**	**200**	**200**
NO_X (as NO_2)	mg/m^3	154.81[6]	196.50[6]	157.58[6]	208.50[6]	**120**	**400**	**400**
Hg	mg/m^3	1.49E-03[7]	6.90E-03[7]	9.83E-04[7]	3.10E-03[7]	**0.02**	**0.05[4]**	**0.05[4]**
Cd & Tl	mg/m^3	6.78E-04[7]	8.10E-04[7]	7.36E-04[7]	1.00E-03[7]	**0.02**	**0.05[4]**	**0.05[4]**
Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V	mg/m^3	0.03[7]	0.05[7]	0.04[7]	0.10[7]	**0.3**	**0.5[4]**	**0.5[4]**
Dioxins & Furans Upper Limit (worst case where <LOD = LOD)							**0.1[5]**	**0.1[5]**
Dioxins & Furans (NATO I-TEQ)	ng/m^3	4.97E-03[9]	3.13E-02[9]	7.18E-04[9]	2.00E-03[9]	**0.04**		
Dioxins & Furans Lower Limit best case where <LOD = 0)								
Dioxins & Furans (NATO I-TEQ)	ng/m^3	4.86E-03[9]	3.13E-02[9]	5.63E-04[9]	2.00E-03[9]	**0.04**		

[1] Average across all available stack testing reports between December 2017 and October 2019
[2] Maximum recorded across all available stack testing results
[3] IED emission limit value, column A, ½ hour max.
[4] IED emission limit value, sampling period of a minimum of 30 minutes and a maximum of 8 hours
[5] IED emission limit value, sampling period of a minimum of 6 hours and a maximum of 8 hours
[6] 30 minute sampling period
[7] average of 12x 16 minute sampling periods
[8] 1 hour sampling period
[9] 6 hour sampling period

It is important to also note that the modelling applies conservative estimates for the plant emissions, consistent with the maximum potential levels that might be emitted, thus also accounting for any potential variability in the feed waste material affecting the post treatment emissions that may be released. This is evident as the measured emissions from the comparable reference plant in Dublin on a similar scale with similar waste inputs, similar plant design and similar pollution controls, are much lower than the levels modelled in every assessed scenario in this assessment.

It should be noted that any hazardous waste is explicitly excluded from the incoming waste stream and the proposal has implemented protocols to manage and mitigate any potential 'rogue' waste, e.g. inspection regimes, scanning for radioactive material etc. It is evident from the Dublin reference facility that incoming waste is appropriately managed and demonstrated to operate within their emission limits. The management of hazardous waste is expanded on in Chapter 5 'EfW Policy'.

Table 6-11 below presents a comparison of the flow parameters from the proposal using the design point (LP1) for comparison with the Dublin Waste to Energy reference facility.

The comparison shows that the proposal's stack parameters as per the operational design point (LP1) are generally similar to that of the reference facility. As the proposal has a similar design and pollution controls and would process similar compositions in MSW and residual C&I waste to the reference facility the actual emissions are also expected to be similar.

Table 6-11: Comparison of LP1 and Dublin Waste to Energy reference facility flow parameters

Parameter	Units	LP1	Line 1		Line 2	
			Ave.[1]	Max[2]	Ave.[1]	Max[2]
O_2 (wet)	% v/v	6.7	5.51	5.93	5.58	6.89
water vapour	% v/v	21.5	23.49	24.90	23.01	24.60
stack gas temp	deg C	61	71.17	73.97	69.42	73.86
stack gas velocity	m/s	20.9	17.70	18.70	17.56	18.40
volumetric flow rate (Ref.)	Nm^3/hr	189,630	252,536	269,476	251,242	265,002
volumetric flow rate (Actual)	Am^3/hr	236,435	214,365	260,869	240,458	249,521

[1] Average across all available stack testing reports between December 2017 and October 2019
[2] Maximum recorded across all available stack testing results

Table 6-12 below presents an analysis of the metal emissions in each of the lines at the Dublin Waste to Energy reference facility. The data from the Dublin facility allows the individual metal fractions of the reported combined metals concentrations to be applied in the assessment for comparison with NSW criteria. For example, the data indicate that cadmium is approximately 53% of the total cadmium plus thallium result, and that nickel at 36% is the main fraction of the 'sum of 9 metals' value applied in Europe.

Note that each result for the individual metals is based on the average of three sample runs per sampling session at the Dublin plant, with each run comprising four individual 16-minute sampling period results (i.e. an overall average sample taken over 64 minutes), and are thus comparable to the NSW sampling average period of approximately 1-hour.

Table 6-12: Metal distribution - Dublin Waste to Energy reference facility

Pollutant	Units	Line1			Line2			Average ratio across both Lines
		Ave.[(1)]	Max[(2)]	Fraction (%)	Ave.[(1)]	Max[(2)]	Ratio	
Cd+Tl Stack Testing	mg/m3	6.78E-04	8.10E-04	100%	7.36E-04	1.00E-03	100%	100%
Cd	mg/m3	3.52E-04	4.33E-04	52%	3.85E-04	5.67E-04	55%	53%
Tl	mg/m3	3.22E-04	4.00E-04	48%	3.19E-04	4.67E-04	45%	47%
Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V	mg/m3	3.00E-02	5.20E-02	100%	3.64E-02	9.50E-02	100%	100%
As	mg/m3	6.41E-04	2.07E-03	3%	6.48E-04	2.00E-03	2%	3%
Co	mg/m3	3.33E-04	3.67E-04	1%	1.62E-03	9.30E-03	3%	2%
Cr	mg/m3	5.97E-03	2.02E-02	21%	6.50E-03	1.49E-02	21%	21%
Cu	mg/m3	6.81E-03	1.74E-02	22%	8.03E-03	3.22E-02	22%	22%
Mn	mg/m3	1.11E-03	2.13E-03	5%	1.61E-03	4.33E-03	7%	6%
Ni	mg/m3	1.27E-02	3.34E-02	39%	1.62E-02	6.38E-02	34%	36%
Pb	mg/m3	1.77E-03	6.63E-03	7%	1.97E-03	5.83E-03	7%	7%
Sb	mg/m3	4.59E-04	7.00E-04	2%	4.89E-04	8.67E-04	2%	2%
V	mg/m3	2.74E-04	4.00E-04	1%	3.00E-04	4.67E-04	1%	1%

[(1)] Average across all available stack testing reports between December 2017 and October 2019

[(2)] Maximum recorded across all available stack testing results

6.5.5 PFAS

Per- and polyfluoroalkyl substances (PFAS) are man-made chemicals made up of multiple fluorine atoms attached to an alkyl chain. PFAS have been widely used in industrial and consumer products since the mid-1900s, however, these days application and uses of PFAS are being reduced.

In particular, the use of PFAS in acceptable waste material that would be processed for the proposal is largely discontinued and any incoming PFAS to the proposal would be at trace levels. Furthermore, the majority of these chemicals would be destroyed via the incineration process and pollution controls would contain any residue that may not be destroyed (e.g. particle and wet scrubber with dosing). Thus, any levels of PFAS from the proposal are expected to be less than trace levels.

To our understanding nil or very little data for PFAS is available from waste to energy facilities and no regulatory limits exist, possibly due to very small trace levels of PFAS if any, which are also difficult to measure. This is consistent with the reference facilities where PFAS is not identified as being an emitted substance from the Dublin reference facility (or any other waste to energy facility to our understanding). Thus, PFAS is not considered a potential pollutant to be emitted from the proposal and has not been considered further in this assessment.

6.6 Construction phase

6.6.1 Introduction

The construction activities associated with the proposal have the potential to generate some dust emissions primarily generated from the handling of material, vehicle movements, exhaust emissions from diesel powered equipment and windblown dust generated from exposed areas. The potential impact due to these activities is difficult to accurately quantify on any given day due to the temporary and sporadic nature of these activities and the short term and variable location of any one activity during the construction phase.

The potential dust emissions generated during the construction phase are expected to be minimal and controllable using standard methods, and as such have been assessed using two different methods. These include a qualitative approach and a quantitative approach using dispersion modelling.

6.6.2 Qualitative assessment of the risk of dust impacts

The qualitative approach is on the basis of risk to determine the activities that pose the greatest risk of air quality impacts during the construction phase, which can be used to identify the key activities and to focus controls to manage the risk appropriately, and where required reduce the impact through proactive management.

The methodology presented in the Institute of Air Quality Management (IAQM) document *Guidance on the assessment of dust from demolition and construction* (**IAQM, 2014**) has been used to assess the potential risks from construction impacts associated with the proposal.

The IAQM guidance methodology considers three separate dust air quality impacts during construction activities:

- Annoyance due to dust deposition;
- Harm to ecological receptors, referring to direct impacts on vegetation or aquatic ecosystems, from dust deposition; and
- The risk of health effects due to a significant increase in exposure to PM_{10}.

A risk based assessment of the potential dust effects due to specific construction activities is determined by the scale and nature of the works, the proximity to receptors to identify the likelihood of an impact arising and the magnitude of specific mitigation required to ensure impacts are managed effectively.

The activities that have potential to generate dust impacts for the proposal considered in the risk assessment include demolition, earthworks, construction and track-out from unpaved roads onto public roads.

A site is allocated a risk category based on two factors, the scale and nature of works and the sensitivity of the area to dust impacts.

The potential dust emission magnitude associated with the construction activity for the proposal is outlined in **Table 6-13**.

Table 6-13: Potential dust emission magnitude

Activity	Dust emission magnitude	Comment
Demolition	Medium	Total building volume 20,000m^3 – 50,000m^3, potentially dusty construction material.
Earthworks	Large	Total site area >10,000m^2, potentially dusty soil type, >10 heavy earth moving vehicles active at any one time and total material moved >100,000 tonnes.
Construction	Large	Total building volume >100,000m^3.
Trackout	Large	>50 heavy vehicles per day, potentially dusty surface material and unpaved road length >100m.

The sensitivity of the area surrounding the construction activity is defined in **Table 6-14**.

Table 6-14: Outcome of defining the sensitivity of the area

Potential impact	Sensitivity of the surrounding area				Comment
	Demolition	Earthworks	Construction	Trackout	
Dust soiling	Low	Low	Low	Low	Low sensitivity area with receptors located >50m
Human health	Low	Low	Low	Low	Medium sensitivity area with annual mean PM_{10} <28µg/m^3
Ecological	Low	Low	Low	Low	Low sensitivity area

The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impact with no mitigation applied. The risk of dust impact for the four activities are summarised in **Table 6-15**.

Table 6-15: Summary of dust risk to define site-specific mitigation

Potential impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	Low Risk	Low Risk	Low Risk	Low Risk
Human health	Low Risk	Low Risk	Low Risk	Low Risk
Ecological	Low Risk	Low Risk	Low Risk	Low Risk

Based on the outcomes of the risk assessment, the following mitigation measures outlined in **Table 6-16** are recommended to be implemented for the proposal to minimise the risk of dust impacts occurring.

Based on the risk assessment the highly recommended and desirable mitigation measures are outlined in **Table 6-16**.

Table 6-16: Summary of potential mitigation measures during construction phase

Activity	Mitigation measure
Communications	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
Dust management	Develop and implement a Dust Management Plan (DMP).
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked.
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Site layout	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.

Activity	Mitigation measure
	Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary - no idling vehicles.
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
	Impose and signpost a maximum-speed-limit of 25km/h on surfaced and 15km/h on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	Avoid bonfires and burning of waste materials.
Demolition	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.
	Bag and remove any biological debris or damp down such material before demolition.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Track out	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Given that the IAQ method identifies a potential high risk based on the scale of dust emissions, but finds overall a low risk based on the distance to sensitive receptors, it was considered to test this explicitly using a quantitative dispersion modelling approach as below.

6.6.3 Quantitative assessment of construction dust impacts

The significant dust generating activities associated with operation of the proposal are identified to occur in the Phase 1 - Demolition and Phase 2 – Site Establishment and Enabling Works of the construction phases. The other construction phases of the proposal would occur after these two phases and have a lower propensity to generate dust emissions overall through the nature of the proposed activities.

The proposed activities during Phase 1 and Phase 2 include the removal of the existing structures and other infrastructure at the site, site clearing, site establishment works including bulk earthworks across the site. The significant dust generating activities are identified as the loading/unloading of material, vehicles travelling on-site and off-site, dozer ripping and pushing material, graders maintaining haul road surfaces and windblown dust from exposed areas and stockpiles. The vehicles, plant and equipment operating on the site also have the potential to generate particulate emissions from diesel exhaust.

Dust emission estimates for Phase 1 and Phase 2 have been calculated by analysing the various types of dust generating activities taking place and utilising suitable emissions sourced from United States Environmental Protection Agency (US EPA) developed documentation. A summary of the estimated dust emissions is presented in **Table 6-17**.

Table 6-17: Summary of estimated dust emissions for the construction activity (kg)

Activity	TSP emission	PM_{10} emissions	$PM_{2.5}$ emissions
Demolition of structures	53	25	4
Loading material to haul truck	53	25	4
Transporting material off-site	1,216	312	31
Dozer ripping/ pushing material	6,025	1,456	633
Loading in-situ material to haul truck	126	60	9
Transporting in-situ material on-site	1,751	450	45
Transporting imported fill material on-site	770	198	20
Unloading imported fill material	28	13	2
Loading unsuitable material to haul truck	10	5	1
Transporting unsuitable material off-site	128	33	3
Grading/ forming roads	3,545	1,239	110
Wind erosion	2,631	1,315	197
Diesel exhaust	212	212	205
Total emissions	**16,547**	**5,342**	**1,264**

To quantitatively assess the potential for air quality impacts associated with the construction activity, the dust emissions were represented by a series of volume sources and were included in the CALPUFF model via an hourly varying emission file. Meteorological conditions associated with dust generation (such as wind speed) and levels of dust generating activity were considered in calculating the hourly varying emission rate for each source.

It should be noted that the Phase 1 and Phase 2 works are proposed to occur concurrently and are estimated to require between six to nine months to complete. For the purposes of this modelling assessment, the estimated dust emissions in **Table 6-17** have been doubled to assess the impact over the full 12 month modelling period (and not just the nominal 6 to 9 month period of these dustiest activities).

Figure 6-5 to **Figure 6-10** present isopleths of the spatial distribution of predicted incremental impacts predicted to arise due to the construction activity in isolation (incremental impact) for maximum 24-hour average $PM_{2.5}$ and PM_{10}, annual average $PM_{2.5}$, PM_{10}, TSP and deposited dust levels. The results show minimal incremental effects would arise at the nearest receptor locations due to the construction activity.

Figure 6-11 to **Figure 6-22** present isopleths of the spatial distribution of predicted cumulative impacts predicted to arise due to the construction activity for maximum 24-hour average $PM_{2.5}$ and PM_{10}, annual average $PM_{2.5}$, PM_{10}, TSP and deposited dust levels, with and without contributions from the Next Generation energy to waste facility.

Cumulative dust impacts predicted over the relevant criteria arise due to existing background level being above the criteria already. The predicted cumulative dust impacts with contributions from the Next Generation energy to waste facility in **Figure 6-17** to **Figure 6-22** indicate the cumulative impact from the Next Generation energy to waste facility is indiscernible.

Overall, the low incremental predictions at the receptors in **Figure 6-5** to **Figure 6-10**, when considered with the potential background air quality levels shown in **Section 5.3**, indicate that any potentially significant cumulative dust impacts associated with the construction activity are unlikely to occur at any receptor locations. To ensure that activities associated with the construction phase have a minimal effect on the surrounding environment, it is anticipated that a suitable Dust Management Plan would be developed to assist with the management of air emissions. The Dust Management Plan would outline all reasonable and practicable dust mitigation measures be utilised during the construction phase and include aspects such as complaints management and response mechanisms.

Figure 6-5: Construction - Predicted incremental maximum 24-hour average $PM_{2.5}$ concentrations (µg/m³)

Figure 6-6: Construction - Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³)

Figure 6-7: Construction - Predicted incremental maximum 24-hour average PM_{10} concentrations (µg/m³)

Figure 6-8: Construction - Predicted incremental annual average PM_{10} concentrations (µg/m³)

Figure 6-9: Construction - Predicted incremental annual average TSP concentrations (µg/m³)

Figure 6-10: Construction - Predicted incremental annual average dust deposition levels (g/m²/month)

Figure 6-11: Construction - Predicted cumulative maximum 24-hour average $PM_{2.5}$ concentrations (µg/m³) - without contributions from the Next Generation energy to waste facility

Figure 6-12: Construction - Predicted cumulative annual average $PM_{2.5}$ concentrations (µg/m³) - without contributions from the Next Generation energy to waste facility

Figure 6-13: Construction - Predicted cumulative maximum 24-hour average PM_{10} concentrations (µg/m³) - without contributions from the Next Generation energy to waste facility

Figure 6-14: Construction - Predicted cumulative annual average PM_{10} concentrations (µg/m³) - without contributions from the Next Generation energy to waste facility

Figure 6-15: Construction - Predicted cumulative annual average TSP concentrations (µg/m³) - without contributions from the Next Generation energy to waste facility

Figure 6-16: Construction - Predicted cumulative annual average dust deposition levels (g/m²/month) - without contributions from the Next Generation energy to waste facility

Figure 6-17: Construction - Predicted cumulative maximum 24-hour average $PM_{2.5}$ concentrations (µg/m³) - with contributions from the Next Generation energy to waste facility

Figure 6-18: Construction - Predicted cumulative annual average $PM_{2.5}$ concentrations (µg/m³) - with contributions from the Next Generation energy to waste facility

Figure 6-19: Construction - Predicted cumulative maximum 24-hour average PM_{10} concentrations (µg/m³) - with contributions from the Next Generation energy to waste facility

Figure 6-20: Construction - Predicted cumulative annual average PM_{10} concentrations (µg/m³) - with contributions from the Next Generation energy to waste facility

Figure 6-21: Construction - Predicted cumulative annual average TSP concentrations (µg/m³) - with contributions from the Next Generation energy to waste facility

Figure 6-22: Construction - Predicted cumulative annual average dust deposition levels (g/m²/month) - with contributions from the Next Generation energy to waste facility

6.7 Commissioning

On completion of construction, testing of all major processes including emission control systems will commence. During commission it is understood the proposal will operate as though in full operation for limited periods. This is a normal and necessary part of the commissioning process to ensure that the facility can operate at the appropriate standards.

It is noted (as presented later in **Section 7**) that significant air quality impacts due to the proposal are not expected to occur. During commission it is expected the proposal will also be able to operate without impacts.

6.8 Transportation of materials

This section describes the proposal's impact on local road transportation emissions. Traffic movements associated with the proposal have the potential to generate emissions primarily generated from hot exhaust emissions from diesel vehicles which have been analysed below.

The total number of trucks estimated on-site per day is 236, of which 161 trucks per day would deliver waste to the site. Comparatively, this is a very low proportion of the vehicle numbers on adjacent roads such as the WestLink M7. Furthermore, it is understood that the proposal is designed to treat residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that are sourced in the general area and would otherwise be sent to landfill. Thus, the actual number of vehicles on the roads near to residential receptors is not expected to change in any discernible way.

Consequently, the changes in emissions from the transportation of materials on public roads are expected to be negligible relative to the current situation. Regardless, an approximate analysis of the expected transportation emissions as a result of the proposal from each postcode within a 10km radius of the proposal site has been conducted and presented below.

The analysis has estimated emissions for two scenarios;

- Existing Scenario - Represents the road emissions without the operation of the proposal; and,
- Proposal Scenario - Represents the road emissions with the operation of the proposal.

The existing scenario assumes that without the proposal, waste within a 10km radius goes to the nearest landfill presented in **Figure 6-23**. Following this, a proportion of waste received at the Cleanaway Erskine Park Landfill is then directed to ResourceCo and the Summerhill landfill. Its important to note that the Summerhill landfill is not pictured in **Figure 6-23** and is approximately 130km from Cleanaway Erskine Park Landfill.

The proposal scenario assumes that with the operation of the proposal, waste within a 10km radius goes to the nearest landfill via the same route unless it is closer to the proposal site itself, in which case waste from that postcode goes directly to the proposal facility. Following this, the proportion of waste that would have prior been sent to ResourceCo and Summer hill landfill from Cleanaway Erskine Park Landfill is then sent to the proposal facility, along with waste sourced from suppliers and other landfills.

The kilometres travelled in each scenario were multiplied by exhaust emissions factors for heavy duty diesel rigid or articulated trucks (dependent on truck type) sourced from the NSW EPA document *Air Emissions Inventory for the Greater Metropolitan Region in New South Wales 2008 Calendar Year Commercial Emissions, On-Road Mobile Emissions* (**NSW EPA, 2012**). Note that all trucks travelling from a postcode to the nearest landfill have been assumed as compact rigid trucks.

Table 6-18 below presents the assumed truck numbers and the proportion of waste to and from each landfill. The analysis in **Table 6-19** presents the expected change in emissions as a result of the proposal and the total road emissions generated in each postcode. Note that a negative number infers a decrease in emissions as a result of the proposal.

The analysis in **Table 6-19** shows that the proposal would result in a slight overall increase in road emissions. The fraction of emissions generated with or without the proposal is negligible compared to the total road emissions generated by postcode. Thus, the changes in emissions from the transportation of materials on public roads are not expected to result in any adverse air quality impacts and would be unlikely to be discernible from existing levels.

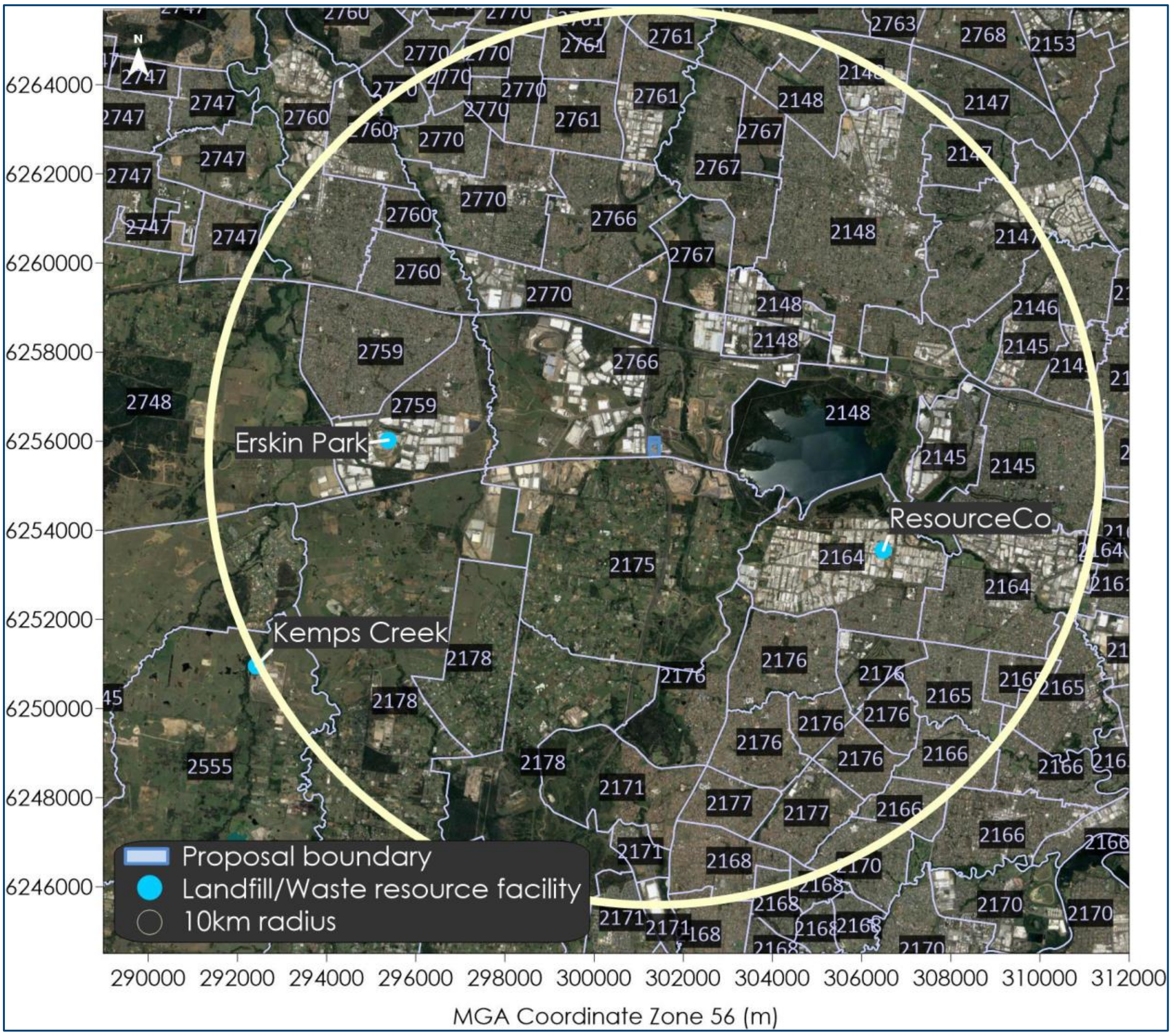

Figure 6-23: Postcodes and nearest landfills within 10km radius of proposal site

Table 6-18: Proportion of waste to landfills

From site	To site	Assumed % of waste	Yearly volume (tonnes)	daily volume (tonnes)	Truck capacity (tonnes)	Number of trucks (daily)
Without proposal						
Cleanaway Erskine Park	ResourceCo	38%	95,000	317	20	16
Cleanaway Erskine Park	Summer Hill	62%	155,000	517	20	26
With proposal						
Cleanaway Erskine Park	WSERRC	50%	250,000	833	20	42
ResourceCo	WSERRC	25%	125,000	417	7	60
SUEZ Kemps Creek	WSERRC	25%	125,000	417	7	60

Table 6-19: Road emissions from the proposal and total road emissions by postcode

Postcode	Total existing road emissions (t/yr)			Change in emissions due to proposal (t/yr)		
	NO_x	$PM_{2.5}$	VOC	NO_x	$PM_{2.5}$	VOC
2145	590.7	24.9	214.8	-0.01	0.00	0.00
2146	133	5.6	51.3	0.00	0.00	0.00
2147	283	11.6	113.5	0.00	0.00	0.00
2148	593	24.6	215.3	-1.12	-0.03	-0.06
2164	437	18.9	135.6	0.25	0.04	0.07
2165	169	7.0	71	-0.01	0.00	0.00
2166	190	7.7	96	-0.01	0.00	0.00
2168	81	3.1	40	0.00	0.00	0.00
2170	1170	47.2	387	-0.02	0.00	0.00
2171	377	15.1	104	0.00	0.00	0.00
2175	271	10.8	58.6	1.22	0.09	0.18
2176	173	7.1	90	0.02	0.00	0.00
2177	64.0	2.6	33.2	0.02	0.00	0.00
2178	127	5.2	33.3	2.48	0.15	0.30
2748	145	5.7	43	0.00	0.00	0.00
2759	75	2.9	35	-0.08	0.00	-0.01
2760	281.3	11.4	101.4	0.00	0.00	0.00
2761	311.9	12.5	89.2	-1.22	-0.04	-0.07
2766	676	27.6	171.2	0.39	0.01	0.02
2767	58	2.5	30.0	0.01	0.00	0.00
2770	263	10.3	112	-1.37	-0.04	-0.08
Total	**6469**	**264**	**2225**	**0.55**	**0.18**	**0.35**
Fraction of total road emissions				**0.01%**	**0.07%**	**0.02%**

Its important to note that if the transport of waste to the Summerhill landfill along the full route approximately 130km away was considered, this would clearly show a net reduction in total emissions.

6.9 Odour

Fugitive odour emissions from the proposal have been identified as potentially arising from trucks delivering waste and collecting residue, and from the opening of the bunker room doors where the waste is contained.

For odour emissions arising from the opening of the bunker room doors, the area of the bunker room (~4,000m²) is assumed to be covered in odorous waste material. The bunker room is designed to be under slight negative pressure and the internal, odour laden air passes through the furnace. This limits the potential for odours to escape from the bunker room doors as they open and close to let trucks in and out. However, some emissions would be emitted as a fugitive odour via the access doors. Odour emissions rates for the bunker room were estimated on estimated air flows through the door, consistent with other operating facilities, and are set out in **Table 6-20**.

Odour emissions from trucks delivering waste and collecting residue were also modelled on-site, per the proposal maximum receival capacity, i.e. 24 trucks per hour.

Odour emission rates from the waste and truck surfaces were estimated based on data collected at landfill operations (**Todoroski Air Sciences, 2018**). An odour emission rate of 8.5ou/m^2/s was used to represent the emissions from the waste material and the rear part of trucks at the facility.

A summary of the modelled odour source parameters and odour emission rates (OERs) applied is presented in **Table 6-20**.

Table 6-20: Summary of modelled odour source parameters

Source	Bunker room doors	Trucks delivering waste and collecting residue
Type	Volume	Volume
Effective height (m)	5	4.3
Initial lateral dimension, Sig y (m)	1.4	2
Initial vertical dimension, Sig z (m)	1.2	1
Surface Area (m^2)	4,000	5.8*
OER (OU.m^3/s)	1,518	1,175

*Surface area (m^2) per truck

6.10 Other sources

This assessment has considered the emissions from other projects (approved or potentially to be approved) as part of the cumulative total impact. The projects identified below are shown in **Figure 6-24.**

As specifically required by DPIE, this assessment has included the predicted additional impacts due to the Next Generation Energy from Waste Facility (in addition to the proposal and existing background levels) to account for the potential changes in the future background air quality levels when determining the cumulative total impacts in future years. This assessment has modelled the Next Generation Energy from Waste Facility using the stack parameters and emissions estimates according to the **Pacific Environment (2017)** air quality assessment at 552,500tpa capacity for the expected operations. The modelled parameters and emission rates for the Next Generation Energy from Waste Facility are presented in **Section 6.10.2**.

It is noted that the Western Sydney Airport is approximately 15km away and a review of its impact assessment shows that it would not affect the background concentration levels near to the proposal. As such the airport has not been included in the cumulative assessment. Similarly, the Mt Piper Energy Recovery Project (approximately over 90km away from the proposal), the Botany Cogeneration Plant (approximately 38km away from the proposal) and Brandown Resource and Recovery Centre (approximately 13km away from the proposal) have also not been included as they would not discernibly affect background levels in the vicinity of the project.

Other projects in the surrounding area include the existing Austral Bricks facilities which proposed upgrades to their Plant 2 operations per a revised Air Quality Impact Assessment (AQIA) submitted in December 2019. That project appears to be for a relatively minor modification, within the plants operational range, and would not affect the existing environment significantly. In any case, the unclear publicly available data would prevent any reasonable modelling of the proposed operations. It is also noted however that the emissions are emitted from tall, hot stacks with what appear to be relatively good dispersion characteristics, and that the majority of the emissions from these sites are from the existing operations, which already appear to be reflected relatively well in the background data.

The Bettergrow Pty Ltd Greenspot Wetherill Park (GWP) resource recycling and recovery centre assessment of dust impacts provided a maximum predicted result of <1µg/m^3 and <0.5µg/m^3 for a 24-hour and annual average concentrations of PM_{10}, respectively, and a maximum annual average concentration <1µg/m^3 for TSP, within a 1.5km radius of the site. The Bettergrow Pty Ltd GWP resource recycling and recovery centre would not tangibly affect the cumulative levels due its distance from the proposal (approximately 5km) and negligible levels beyond a 1.5km radius. Thus, the facility was not considered further.

Gazcorp Industrial Estate is approved for construction of an industrial warehouse estate comprising sixteen warehouses and a Stage 1 Development Application. The project has advised the major emissions associated with the construction and operation of the Project include trucks and forklift movements which would comply with the POEO (Clean Air) Regulation and will implement an Air Quality Management Plan (AQMP) incorporated with use of Best Practice air quality management techniques. Quantitative air quality impacts predicted for the Project are unknown, however these are expected to be minimal and comply with the project consent. Appropriate mitigation measures are expected to be sufficient to mitigate any air quality impacts. Thus, the facility was not considered further.

The Light Horse Interchange Business Hub Eastern Creek Concept has identified potential sources and impacts of fugitive dust emissions during the demolition and construction stage. A qualitative assessment of dust emissions is provided in the AQIA and is expected to be of low risk and include a range of mitigation measures to reduce risks to negligible levels. Thus, the facility was not considered further.

The Roberts Road Data Centre is proposed for construction and operation of a data storage facility. Emissions from operation of the project include ventilation and cooling powered by electricity from the grid and are expected to be negligible. Fugitive emissions associated from the construction of the Roberts Road Data Centre are expected to be infrequent and temporary, and will be managed by appropriate mitigation measures, contingency plans, response procedures and monitoring and reporting protocols. A qualitative assessment of dust emissions is provided in the AQIA and is expected to be of low risk. Thus, the facility was not considered further.

The Western Sydney Green Gas Project AQIA qualitatively assessed air quality impacts and is not expected to result in any significant sources of emissions. There are no sources of dust and particulates associated with the project. Thus, the facility was not considered further as a potential cumulative source. Furthermore, no quantitative air quality impacts were assessed which would be needed to accurately model proposed operations.

The Eastern Creek Resource Recovery Centre proposes to construct and operate a resource recovery facility comprising a concrete recycling plant to process up to 100,000 tpa with a storage capacity of 36,000 tpa. At the time of this assessment the project is in the process of preparing the EIS and the relevant AQIA that would be required to accurately model proposed operations. It expected that the air quality impacts from the Project will comply with the POEO (Clean Air) Regulation and be well managed by the appropriate mitigation measures.

Potential cumulative impacts may arise from the Sydney International Speedway project approximately 1.6km to the northeast of the proposal. Potential dust impacts from construction and operation of the Sydney International Speedway project may lead to elevated cumulative dust impacts. Additionally, potential NO_x impacts from exhaust emissions from racing vehicles may have a cumulative impact. At the time of this assessment, limited information regarding operations at the site of the Sydney International Speedway project could be found that would be required to accurately model proposed operations. It is noted that (as presented later) the dust and NO_x predicted incremental impacts from the proposal are well controlled and discernible impacts would not arise close to any receptors, meaning cumulative impacts would be negligible.

6.10.1 Other odour sources

The adjacent Global Renewables Limited Resource Recovery Facility was identified as a potential cumulative odour source. However limited information regarding operations at the site could be found and would be required to accurately model proposed operations.

Odour from the Bettergrow Pty Ltd Greenspot Wetherill Park (GWP) resource recycling and recovery centre has not been included in this assessment for cumulative odour impacts due its distance from the proposal (approximately 5km) and predicted odour impacts below 2OU beyond the site boundary.

Overall, it is noted that (as presented later) the anticipated odour from the proposal will be well controlled and no discernible odour would arise close to any sensitive receptors, meaning cumulative impacts would be also not be discernible.

Figure 6-24: Other projects considered

6.10.2 The Next Generation Energy from Waste Facility modelled parameters

This assessment has modelled the Next Generation Energy from Waste Facility using the stack parameters and emissions estimates according to the **Pacific Environment (2017)** air quality assessment at 552,500tpa capacity for the expected operations.

The stack parameters considered in the dispersion modelling for the Next Generation Energy from Waste Facility are summarised below in **Table 6-21**.

Table 6-21: Emission source parameters for the Next Generation Energy from Waste Facility

Parameter	Modelled
Eastings (m)	298633
Northing (m)	6257734
Stack height (m)	100
Stack diameter (m)	3.1
Exit velocity (m/s)	21.7
Exit temperature (K)	393
Flowrate (Nm3/s)	127
Flowrate (Am3/s)	165.2

Nm^3/s = reference gas flow, dry at 11% O_2.
Am^3/s = actual gas flow, wet, corrected for temperature

The emission rates adopted for modelling the Next Generation Energy from Waste Facility are presented below in **Table 6-22**. Note that not all pollutants modelled in this assessment were modelled in the Next Generation Energy from Waste Facility Air Quality and Greenhouse Gas Assessment (**Pacific**

Environment, 2017). As such, when assessing the cumulative impacts from the proposal and (in addition to the existing measured background levels), not all pollutants modelled in this assessment have a contribution from the Next Generation Energy from Waste Facility.

Table 6-22: Emission rates for the Next Generation Energy from Waste Facility

Pollutant	Emission rate g/s
CO	2.9
TOC	0.15
Dust	0.14
$PM_{2.5}$	0.13
PM_{10}	0.13
HCl	1.14
HF	0.06
SO_2	3.4
NOx (calculated as NO_2)	15.2
NH_3	0.25
Hg	5.00E-04
Cd	1.10E-03
Dioxins	1.3E-09
As	0.003
Cr	2.00E-05
Cu	0.002
Mn	0.008
Ni	0.028
Pb	0.02
Sb	0.002
Be	1.00E-06

6.11 Ozone Impact Assessment

An ozone assessment was undertaken in accordance with the NSW EPA's *Tiered Procedure for Estimating Ground Level Ozone Impacts from Stationary Sources* (**NSW EPA, 2011**).

Classification of the region within which the proposal is located as a non-attainment area was determined using measured ambient ozone concentrations from DPIE ambient air quality monitoring stations over the last 5 years (2015-2019).

The predicted NO_x emissions from the facility exceed the emission threshold for new or modified sources within an ozone non-attainment area (NO_x/VOC emission rate >90 tonnes per year). Therefore, a Level 1 Screening Assessment was undertaken.

For a Level 1 Screening Assessment the predicted incremental increase in 1-hour and 4-hour average ambient ozone concentrations is evaluated against a Screening Impact Level (SIL) of 0.5 parts per billion (ppb) and against the maximum allowable increment of 1ppb for an ozone non-attainment area. If the maximum ozone increment is below the SIL and/or below the maximum allowable increment, an ozone Level 2 Refined Assessment is not required but a best management practice (BMP) determination should be undertaken.

Note that the Level 1 Screening Assessment input requirements is for tonnes per day, therefore, the expected 24-hour emission rates for the proposal were used in the Level 1 Screening Assessment.

Table 6-23 and **Table 6-24** below presents a summary of the inputs for the Level 1 Screening Assessment and the results. The results show that the predicted incremental increase in 1-hour and 4-hour average ambient ozone concentrations is below the SIL of 0.5 ppb with Readily Available Technology (RAT), thus, no further ozone assessment is required.

Table 6-23: Inputs for Ozone Level 1 Screening Assessment

Modelled max 24-hour average concentration (mg/Nm³)	Calculation inputs	
-	Source Region	Sydney West
-	VOC Input Option	Default VOC Reactivities
-	CH4 (t/d)	0.00
50	CO (t/d)	0.46
120	NOx (t/d)	1.10
10	VOC (t/d)	0.10

Table 6-24: Ozone Level 1 Screening Assessment results

Max 1-hr Inc. (ppb)	Max 4-hr Inc. (ppb)	Analysis
0.4	0.3	Pass (≤0.5ppb SIL) with RAT

7 DISPERSION MODELLING RESULTS

This section presents the predicted impacts on air quality which may arise from air emissions generated by the proposal, per Scenario 1 to Scenario 4. The predicted impacts per the EPA Limit modelling scenario have also been presented. These results for this fifth scenario are hypothetical for the purpose of setting upper bound licence limits.

The predicted impacts for pollutants presented in this assessment are assessed at receptor locations or beyond the boundary as per the as per NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2017**).

Note that for the presented incremental and cumulative NO_2 concentrations the NSW EPA's Janssen Method (NO to NO_2 conversion using empirical relationship) "Level 2 assessment - Contemporaneous Impact and Background" approach has been applied to estimate the NO_X to NO_2 conversion ratio at all locations in the domain to assess potential incremental and cumulative impacts for 1-hour average and annual average NO_2 concentrations in accordance with the NSW EPA Approved Methods.

Further detail regarding the contemporaneous NO_2 assessment is provided in **Appendix E**.

The dispersion model predictions presented in this section include those for the operation of the proposal in isolation (incremental impact) and the operation of the proposal with consideration of other sources (total cumulative impact). The results have been assessed as per NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2017**).

For predicted dispersion modelling results for SO_2, hourly averaged model predictions have been converted to 10-minute and 8-hour averaging periods SO_2 concentrations using the power law conversion provided in the EPA Victoria draft guideline *Guidance notes for using the regulatory air pollution model AERMOD in Victoria* (**EPA Victoria, 2013**).The conversion is provided below where C_a is the relevant averaging predicted concentration, $C_{1\text{-hour}}$ is the 1-hour averaging predicted concentration, and a is the relevant averaging period in minutes.

$$C_a = C_{1\text{-hour}} \text{ x } (60/a)^{0.2}$$

Similarly, for 7 day, 30 day and 90 day HF predicted dispersion modelling results the 24-hour averaged model predictions have been converted using the power law conversion adapted for 24-hour results. The conversion is provided below where C_a is the relevant averaging predicted concentration, $C_{24\text{-hour}}$ is the 24-hour averaging predicted concentration, and a is the relevant averaging period in hours.

$$C_a = C_{24\text{-hour}} \text{ x } (24/a)^{0.2}$$

Note that the modelled ambient air pollutant concentrations included in this assessment have conservatively not included deposition rates. However, wet and dry deposition rates have been modelled and included separately. Thus, for the modelled ambient air pollutant concentrations, all of the emissions released from the plant are part of the calculated result, whereas in reality some small amount of these emissions would deposit out of the air before reaching the receptor. This amount is calculated separately in the deposition results.

It is important to note that when assessing impacts per the LPmax maximum 1-hour average levels, these predictions are based on the highest predicted 1-hour average concentrations which were modelled at each point within the modelling domain for the worst hour in the one year long modelling period (for the most impacting operational load point at any location in any hour). The predictions thus do not represent just one particular hour at a specific load point of the operation, but a combination of all of the worst-case load point operations, for the most impacting hours at every point. Thus the extent of the presented impacts is a large overestimation of what could occur. This is similar for the maximum 24-hour average levels over a 24-hour period.

It is not possible for any combination of the operation, at any load point at any time and place to have higher impacts that those presented.

Associated isopleth diagrams of the dispersion modelling results are presented in **Appendix C**.

Note that the specifically assessed receptors modelled in this assessment include residential, industrial and other community places receptors that are located within a 3km radius from the proposal. A list of assessed receptors is provided in **Appendix D**. The modelling domain includes a grid of other non-discrete receptors.

7.1 Incremental results

Table 7-1 presents the predicted maximum dispersion modelling results for the proposal in isolation. Scenario 1 results are shaded green, Scenario 2 results are shaded blue, Scenario 3 results are shaded orange, Scenario 4 results are shaded yellow and EPA Limit modelling scenario results are shaded purple.

The results in **Table 7-1** indicate that predicted incremental impacts associated with the proposal alone are low, and the maximum predicted air quality levels are below the relevant criteria for all assessed air pollutants. Note that only a few of the pollutants have applicable incremental impact assessment criteria. Cumulative impacts are considered in the next section.

Table 7-1: Incremental dispersion modelling results, maximum predicted concentrations (µg/m³)

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit	
$PM_{2.5}$ (1)	24-hour	-	0.59(0.64)	-(-)	3.83	3.56	-
	Annual	0.02	-(-)	-(-)	-	0.30	-
PM_{10} (1)	24-hour	-	0.61(0.66)	-(-)	3.95	3.68	-
	Annual	0.02	-(-)	-(-)	-	0.30	-
TSP(1)	Annual	0.02	-(-)	-(-)	-	0.30	-
Deposition(1)	Annual*	0.001	-(-)	-(-)	-	0.02	**2**
HF(1)	24-hour	-	0.13(0.13)	-(-)	0.54	0.50	-
	7 days	-	0.08(0.09)	-(-)	0.36	0.34	-
	30 days	-	0.06(0.07)	-(-)	0.27	0.25	-
	90 days	-	0.05(0.05)	-(-)	0.22	0.20	-
SO_2 (1)	10-min	-	-(-)	296(315)	315	296	-
	1-hour	-	-(-)	224(239)	239	224	-
	24-hour	-	3.75(4.03)	-(-)	26.9	25.0	-
	Annual	0.04	-(-)	-(-)	-	1.60	-
NO_2 (1)	1-hour	-	-(-)	130(174)	174	130	-
	Annual	0.33	-(-)	-(-)	-	1.47	-
TOC(2)	1-hour	-	-(-)	9.66(10.5)	10.5	9.66	**29**
HCl(2)	1-hour	-	-(-)	29.0(31.4)	31.4	29.0	**140**
NH_3 (2)	1-hour	-	-(-)	14.5(15.7)	15.7	14.5	**330**
Hg(2)	1-hour	-	-(-)	0.017(0.018)	0.0183	0.02	**1.8**
Cd+Tl	1-hour	-	-(-)	0.010(0.011)	0.0105	0.01	**0.018**
Metals(2),(3)	1-hour	-	-(-)	0.145(0.157)	0.157	0.15	-
Dioxins (2)	1-hour	-	-(-)	2.90x10^-8(3.14x10^-8)	3.14x10^-8	2.90x10^-8	**2.00x10^-06**
Cd(2)	1-hour	-	-(-)	0.005(0.006)	0.006	0.005	**0.018**
Tl(2)	1-hour	-	-(-)	0.005(0.005)	0.005	0.005	-
As(2)	1-hour	-	-(-)	0.004(0.004)	0.004	0.004	**0.09**
Co(2)	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	-
Cr(2)	1-hour	-	-(-)	0.030(0.033)	0.033	0.030	**0.09**
Cu(2)	1-hour	-	-(-)	0.032(0.034)	0.034	0.032	**18**
Mn(2)	1-hour	-	-(-)	0.009(0.01)	0.010	0.009	**18**
Ni(2)	1-hour	-	-(-)	0.052(0.057)	0.057	0.052	**0.18**
Pb(1)	Annual	-	-(-)	0.0001(0.0001)	0.0001	0.0001	**0.5**
Sb(2)	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	**9**
V(2)	1-hour	-	-(-)	0.002(0.002)	0.002	0.002	-
Be(2)	1-hour	-	-(-)	0.0004(0.0004)	0.0004	0.0004	**0.004**
Se(2)	1-hour	-	-(-)	0.011(0.012)	0.012	0.011	-
Sn(2)	1-hour	-	-(-)	0.01(0.011)	0.011	0.010	-

(1) Assessed at receptors
(2) Assessed at and beyond the boundary of the facility
(3) Metals include the sum of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V
* g/m²/month

7.2 Cumulative results

Table 7-2 and **Table 7-3** present the maximum predicted cumulative concentrations. Scenario 1 results are shaded in green, Scenario 2 results are shaded in blue, Scenario 3 results are shaded in orange, Scenario 4 results are shaded yellow and the EPA Limit modelling scenario results are shaded purple.

Table 7-3 includes the additional modelled potential effects of the Next Generation Energy from Waste Facility along with the calculated ambient background levels in **Section 5.3.3** in order to provide a conservative estimate. Cumulative impacts in relation to other projects have been considered in **Section 6.10** above.

Note that only a few of the pollutants have an applicable cumulative impact assessment criterion. However, as a means to quantify potential cumulative impacts for all pollutants, where there are no applicable cumulative impact assessment criteria, the incremental impact assessment criteria has been applied.

Table 7-2 and **Table 7-3** indicate that predicted maximum cumulative concentrations are below the relevant criteria (except for 24-hour average $PM_{2.5}$ and PM_{10} concentrations and annual average $PM_{2.5}$ concentrations, due to the existing background level being above the criteria already).

The predicted incremental annual average $PM_{2.5}$ contribution from the proposal alone is small and is not predicted to result in any discernible impact relative to existing levels. In conjunction with the proposed Best Practice pollution technologies, the proposal is not expected to have any significant cumulative impacts.

The total (cumulative) 24-hour average impacts for $PM_{2.5}$ and PM_{10} have been addressed explicitly in **Section 7.2.1**and show that no additional day above criteria would arise due to the proposal. The total (cumulative) impacts are assessed in accordance with Section 11.2 of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA**, **2017**).

Overall, the results show that the predicted cumulative impacts associated with the proposal at the receptor locations for all assessed pollutants are below criteria, or are unlikely to result in any adverse additional cumulative impacts (for those pollutants such as short term particulate emissions where existing levels exceed criteria, for example due to regional dust or bushfire events).

Short term particulate emissions are assessed in the next section.

Table 7-2: Cumulative dispersion modelling results, maximum predicted concentrations with background levels (µg/m³)

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit	
$PM_{2.5}$ (1)	24-hour	-	30.2(30.2)	-(-)	33.4	33.2	**25**
	Annual	8.22	-(-)	-(-)	-	8.50	**8**
PM_{10} (1)	24-hour	-	69.3(69.4)	-(-)	72.7	72.4	**50**
	Annual	17.6	-(-)	-(-)	-	17.9	**25**
TSP(1)	Annual	63.4	-(-)	-(-)	-	63.7	**90**
Deposition(1)	Annual*	2.80	-(-)	-(-)	-	2.81	**4**
HF(1)	24-hour	-	0.13(0.13)	-(-)	0.54	0.50	**2.9**
	7 days	-	0.08(0.09)	-(-)	0.36	0.34	**1.7**
	30 days	-	0.06(0.07)	-(-)	0.27	0.25	**0.84**
	90 days	-	0.05(0.05)	-(-)	0.22	0.20	**0.5**
SO_2 (1)	10-min	-	-(-)	397(416)	416	397	**712**
	1-hour	-	-(-)	301(316)	316	301	**570**
	24-hour	-	12.4(12.6)	-(-)	35.5	33.6	**228**
	Annual	1.54	-(-)	-(-)	-	3.10	**60**
NO_2 (1)	1-hour	-	-(-)	156(201)	201	156	**246**
	Annual	22.0	-(-)	-(-)	-	23.2	**62**
TOC(2)	1-hour	-	-(-)	9.66(10.5)	10.5	9.66	**29**
HCl(2)	1-hour	-	-(-)	29.0(31.4)	31.4	29.0	**140**
NH_3 (2)	1-hour	-	-(-)	14.5(15.7)	15.7	14.5	**330**
Hg(2)	1-hour	-	-(-)	0.017(0.018)	0.0183	0.02	**1.8**
Cd+Tl	1-hour	-	-(-)	0.010(0.011)	0.0105	0.01	**0.018**
Metals(2),(3)	1-hour	-	-(-)	0.145(0.157)	0.157	0.15	-
Dioxins (2)	1-hour	-	-(-)	2.90x10^-8(3.14x10^-8)	3.14x10^-8	2.90x10^-8	**2.00x10^-06**
Cd(2)	1-hour	-	-(-)	0.005(0.006)	0.006	0.005	**0.018**
Tl(2)	1-hour	-	-(-)	0.005(0.005)	0.005	0.005	-
As(2)	1-hour	-	-(-)	0.004(0.004)	0.004	0.004	**0.09**
Co(2)	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	-
Cr(2)	1-hour	-	-(-)	0.030(0.033)	0.033	0.030	**0.09**
Cu(2)	1-hour	-	-(-)	0.032(0.034)	0.034	0.032	**18**
Mn(2)	1-hour	-	-(-)	0.009(0.01)	0.010	0.009	**18**
Ni(2)	1-hour	-	-(-)	0.052(0.057)	0.057	0.052	**0.18**
Pb(1)	Annual	-	-(-)	0.0001(0.0001)	0.0001	0.0001	**0.5**
Sb(2)	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	**9**
V(2)	1-hour	-	-(-)	0.002(0.002)	0.002	0.002	-
Be(2)	1-hour	-	-(-)	0.0004(0.0004)	0.0004	0.0004	**0.004**
Se(2)	1-hour	-	-(-)	0.011(0.012)	0.012	0.011	-
Sn(2)	1-hour	-	-(-)	0.01(0.011)	0.011	0.010	-

(1) Assessed at receptors

(2) Assessed at and beyond the boundary of the facility. Incremental impact assessment criteria applied.

(3) Metals include the sum of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V

* g/m²/month

Table 7-3: Cumulative dispersion modelling results, maximum predicted concentrations – w/ background levels and Next Generation Energy from Waste Facility (µg/m³)

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit	
$PM_{2.5}$(1)	24-hour	-	30.2(30.3)	-(-)	33.5	33.2	**25**
	Annual	8.22	-(-)	-(-)	-	8.50	**8**
PM_{10}(1)	24-hour	-	69.3(69.4)	-(-)	72.7	72.4	**50**
	Annual	17.6	-(-)	-(-)	-	17.9	**25**
TSP(1)	Annual	63.4	-(-)	-(-)	-	63.7	**90**
Deposition(1)	Annual*	2.80	-(-)	-(-)	-	2.81	**4**
HF(1)	24-hour	-	0.13(0.14)	-(-)	0.54	0.51	**2.9**
	7 days	-	0.09(0.1)	-(-)	0.37	0.34	**1.7**
	30 days	-	0.07(0.07)	-(-)	0.28	0.26	**0.84**
	90 days	-	0.05(0.06)	-(-)	0.22	0.21	**0.5**
SO_2(1)	10-min	-	-(-)	402(421)	421	402	**712**
	1-hour	-	-(-)	305(319)	319	305	**570**
	24-hour	-	12.7(13)	-(-)	35.8	34.3	**228**
	Annual	1.6	-(-)	-(-)	-	3.16	**60**
NO_2(1)	1-hour	-	-(-)	156(201)	201	156	**246**
	Annual	22.0	-(-)	-(-)	-	23.2	**62**
TOC(2)	1-hour	-	-(-)	9.75(10.5)	10.5	9.75	**29**
HCl(2)	1-hour	-	-(-)	29.7(32.1)	32.1	29.7	**140**
NH_3(2)	1-hour	-	-(-)	14.6(15.8)	15.8	14.6	**330**
Hg(2)	1-hour	-	-(-)	0.017(0.019)	0.0186076	0.02	**1.8**
Cd+Tl	1-hour	-	-(-)	0.01(0.011)	0.0111388	0.01	**0.018**
Metals(2),(3)	1-hour	-	-(-)	0.202(0.214)	0.213775	0.20	-
Dioxins (2)	1-hour	-	-(-)	3.02x10^-8(3.26x10^-8)	3.26x10^-8	3.02x10^-8	**2.00x10^-06**
Cd(2)	1-hour	-	-(-)	0.006(0.006)	0.006	0.006	**0.018**
Tl(2)	1-hour	-	-(-)	0.005(0.005)	0.005	0.005	-
As(2)	1-hour	-	-(-)	0.006(0.006)	0.006	0.006	**0.09**
Co(2)	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	-
Cr(2)	1-hour	-	-(-)	0.03(0.033)	0.033	0.030	**0.09**
Cu(2)	1-hour	-	-(-)	0.033(0.036)	0.036	0.033	**18**
Mn(2)	1-hour	-	-(-)	0.014(0.015)	0.015	0.014	**18**
Ni(2)	1-hour	-	-(-)	0.071(0.075)	0.075	0.071	**0.18**
Pb(1)	Annual	-	-(-)	0.0007(0.0007)	0.0007	0.0007	**0.5**
Sb(2)	1-hour	-	-(-)	0.004(0.005)	0.005	0.004	**9**
V(2)	1-hour	-	-(-)	0.002(0.002)	0.002	0.002	-
Be(2)	1-hour	-	-(-)	0.0004(0.0004)	0.0004	0.0004	**0.004**
Se(2)	1-hour	-	-(-)	0.011(0.012)	0.012	0.011	-
Sn(2)	1-hour	-	-(-)	0.01(0.011)	0.011	0.010	-

(1) Assessed at receptors

(2) Assessed at and beyond the boundary of the facility. Incremental impact assessment criteria applied.

(3) Metals include the sum of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V

* g/m²/month

7.2.1 Assessment of Total (Cumulative) 24-hour average $PM_{2.5}$ and PM_{10} concentrations

The maximum measured 24-hour concentrations of $PM_{2.5}$ and PM_{10} have in the past exceeded or come close to the relevant criterion level on occasion. As a result, the NSW EPA “Level 1 assessment – Maximum impact” approach of adding maximum background levels to maximum predicted levels from the proposal would show levels above the criterion whether or not the proposal was operating.

In such situations, the NSW EPA applies a "Level 2 assessment - Contemporaneous impact and background" approach to assess potential impacts.

The analysis has focussed on the assessment locations which represent the closest and most likely impacted receptor locations surrounding the proposal and are a mix of residential and commercial, industrial and residential receptors. The locations of the selected assessed receptors are presented below in **Figure 7-1**.

Figure 7-1: Selected receptors for analysis of 24-hour average impacts

The potential effects of the Next Generation Energy from Waste Facility combined with ambient (background) $PM_{2.5}$ and PM_{10} concentration data corresponding with the year of modelling (2015) from the NSW DPIE monitoring site at Prospect have been applied in this case to represent the prevailing background levels in the vicinity of the proposal and at representative receptor locations surrounding the proposal.

Table 7-4 provides a summary of the findings from the contemporaneous assessment at representative receptors for both $PM_{2.5}$ and PM_{10}. Detailed tables of the contemporaneous assessment results are provided in **Appendix F**.

The results indicate that the proposal does not result in any additional days above the 24-hour average criterion at the assessed receptors for $PM_{2.5}$ and PM_{10}. Based on this result it can be inferred that the proposal does not result in any additional days above the 24-hour average $PM_{2.5}$ and PM_{10} criterion at any of the more distant and less impacted receptor locations surrounding the proposal.

This finding is consistent with the incremental results which show that the maximum 24-hour average $PM_{2.5}$ and 24-hour average PM_{10} concentrations are small. As such, the proposal is expected to have a small influence at the assessed receptor locations and in most cases would be difficult to discern beyond the expected background level.

Table 7-4: NSW EPA contemporaneous assessment – maximum number of additional days above 24-hour average criterion

Receptor ID	$PM_{2.5}$	PM_{10}
R1	0	0
R27	0	0
R37	0	0
R46	0	0
R277	0	0
R319	0	0

7.3 Worst-case assessment of deposited matter on Prospect Reservoir

Figure 7-2 to **Figure 7-4** present the isopleth of the spatial distribution of predicted impacts associated with the proposal for annual average deposited dust in isolation and for annual average deposited dust including contribution from other sources. The levels due to the proposal are approximately between 0.00001 and 0.00003 g/m²/month and are too low to be measurable or detectable.

Figure 7-2: Predicted incremental annual average deposited dust concentrations from the proposal only (g/m²/month)

Figure 7-3: Predicted cumulative annual average deposited dust concentrations without contributions for the Next Generation Energy from Waste Facility (g/m²/month)

Figure 7-4: Predicted cumulative annual average deposited dust concentrations from the proposal and other sources with contributions for the Next Generation Energy from Waste Facility (g/m²/month)

7.4 Assessment of start up, shutdown and upset conditions

7.4.1 Start-up/shut-down conditions

The proposal would operate continuously at nominal design load (see **Figure 3-3**) and start-up and shut-down conditions are expected to be infrequent. Required start-up/shut-down conditions for inspections stops, maintenance periods and any unplanned stop of the main systems and equipment have been anticipated, are automatic and will be carried out in a controlled environment with mitigation measures operating to eliminate the potential for significant emissions during these periods.

When the start-up process is initiated, all auxiliary systems and the flue gas cleaning systems will commence in a predetermined sequence. The proposal will use diesel fuel or gas oil for start-up conditions to reach operational combustion temperatures before any solid fuel is added. An emergency diesel generator will also be available for safe shut-down of the proposal. When required, during the shut-down conditions down process feeding of solid fuel will cease, with residual solid fuel expected to be combusted, releasing diminishing emissions until complete shut-down.

Whilst air pollutants will be released from these processes, the flue gas cleaning systems will be operational and are expected to mitigate the release of air pollutant in the flue gas during start up and shut down procedures. Other emissions are expected to be controlled by proper combustion conditions.

Additionally, the proposal will be equipped with an emergency feed water pump and ID-fans connected to the emergency power systems to ensure a safe shut down even in the event of an electricity black out. Other essential systems will ensure a safe shut-down of the boiler by allowing it to cool before the air flows through the facility and flue gas treatment system is fully shut off.

The total consumption of diesel or gas oil from start-up/shut-down procedures per year is estimated at approximately 2,500 Megawatt hour per year (Mwh/yr), corresponding to 250 m^3 oil. A typical start-up procedure will occur over a 12-hour period. Approximately, 40 m^3 oil is used assuming a 12-hour process to achieve the required incineration temperature of 850 °C, however it is noted that there may be longer or shorter start-up processes.

As per the POEO (Clean Air) Regulation emissions, any emissions from the auxiliary burners and emergency diesel generator during start-up/ shutdown procedures are exempt as they occur too infrequently and can't be reasonably quantified. However, as a means to approximately estimate emissions likely to occur from start-up/shut-down procedures, emission factors for combustion of distillate (diesel) oil in boilers were obtained from the National Pollutant Inventory emission estimation technique manual (**NPI, 2011).**

Table 7-5 below presents the estimated emissions generated from start-up/shut-down procedures and from the design point operation of the proposal (assuming LP1 conditions 100% of the time). Start-up/shut-down conditions have been compared with 1-hour and 24-hour mass emission rates as the typical procedures are anticipated to occur over a 12-hour period. **Table 7-5** indicates that the emissions generated from start-ups and shut-downs are only a small percentage of the emissions under design point operation conditions, assuming no pollution controls are in place.

Furthermore, is it understood that during start-up conditions the combustion process gradually increases to 100% capacity and when the lower emissions from diesel combustion relative to waste combustion and the application of controls is considered, the emissions rates of pollutants during start-up conditions would remain low and comparable to the emissions under design point operation conditions.

Table 7-5: Estimated emissions from start-up/shut-down procedures

Pollutant	Start-up/shut-down Emission rate (g/s)(1)	LP1 emission rate (g/s)		Percentage of start-up/shut down emission rates - uncontrolled	
		1-hour	24-hour	1-hour	24-hour
CO	0.05	10.54	5.27	0.5%	1.0%
NOx	2.10	42.14	12.64	5.0%	16.6%
Dust	0.11	3.16	0.53	3.4%	20.6%
SO2	0.01	21.07	3.16	0.1%	0.5%
TOC	0.02	2.11	1.05	1.0%	2.0%
Cd	4.48E-05	2.11E-03		2.1%	-
Hg	4.48E-05	3.69E-03	2.11E-03	1.2%	2.1%
dioxins	3.47E-10	4.21E-09	6.32E-09	8.2%	5.5%
Metals(2)	4.63E-04(3)	3.16E-02		1.5%	-

(1) Emissions averaged over an assumed 12-hour start-up/shut-down period.
(2) Metal include the sum of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V
(3) Emission factors only available for sum of As + Pb + Cr + Cu + Mn + Ni

The start-up and shut-down emissions must pass through the flue gas treatment system before reaching the stack, and after treatment would be released at a similar small fraction of the design point treated emissions that at proposed to be released. Thus, emissions from start-up and shut-down emissions will be minimised at all times.

It is noted that not all pollutants are controlled primarily by the flue gas treatment, e.g. CO and TOC (are controlled by having good combustion and secondary burning), and some of the pollutant controls require a certain temperature to work, e.g. the SNCR requires the proper reaction temperature to be reached for effective removal of NO_X, (however balancing this is that non-compressed diesel combustion generates relatively low NO_x emissions in the first place and burns more cleanly than solid waste). Considering the relatively infrequent occurrence of start-up and shut-down procedures, the control systems in place, and that emissions from the combustion of diesel fuel would generally burn significantly more cleanly than solid waste fuels, emissions during start-up/shut-down conditions are not considered likely to result in any adverse impacts.

Nevertheless, it is noted that such emissions cannot be predicted with complete certainty, which is a key factor as to why these emissions are exempt from regulatory compliance in the NSW Legislation. The assessment above, and the assumptions that can be made for these situations do however indicate no specific reason for concern that adverse impacts would arise.

7.4.1.1 Odour

As outlined above, emissions including odour will be controlled during start-up and shut-down conditions by using ID-fans (connected to the emergency power systems) to maintain airflows and ensure negative pressure is maintained in the building and also proper combustion conditions. Other essential components such as the boiler, flue gas treatment and turbine will also be connected to this emergency power system that will ensure a safe shut-down of the boiler by allowing it to cool before the air flows through the facility and flue gas treatment system is fully shut off. In the event of a shut-down system, building doors will also be closed to prevent odour impacts.

The waste bunker and tipping hall will also have an exhaust system equipped with an active carbon filter for odour control during stand still of the facility in order to mitigate odour escaping from the waste bunker and tipping hall if the boilers are not operating.

7.4.2 Upset conditions

Consideration of upset conditions (i.e. emergency shutdown and trip scenarios) have been represented in Scenario 4 by modelling the most elevated short term emissions per the most impacting operational load point in each hour of the year, and also assuming this continues each hour for up to 24-hours before any shutdown is initiated.

In the event that the waste calorific value varies from the design point conditions, the combustion control system will adjust to reach the desired conditions to reach design point operation. In the case of a malfunction the facility will implement shut-down operations until design point operational processes can be restored. The proposal has implemented a number of operational control measure processes to mitigate upset conditions and keep the plant operating within the design limits.

The active mixing of the waste by trained crane operators is a skilled task that is designed to increase the waste homogeneity, which assists to minimise operation fluctuations around the operational load and load of pollutants and thus the emissions. As outlined above, the shutdown process involves operating the pollution control equipment and maintaining sufficient air flows though the plant, ensuring no adversely impacting emissions are released. Hence the upset case is best represented by prolonged operation at an extreme load point, e.g. LP3. This has been considered on a 1-hour and 24-hour average basis, given that a 24-hour period represents the extreme duration period for such operation, and is thus represented in the max LP scenarios. The plant will cease to operate beyond any condition that has not been modelled, and thus no greater emissions can occur than those modelled.

7.5 Odour

7.5.1 Predicted impacts

The spatial distribution of the dispersion modelling predictions for the proposal is presented as an isopleth diagram showing the 99th percentile nose-response ground level odour concentrations in **Figure 7-5**.

The NSW criteria of 2 OU has been adopted in this assessment. The results indicate that odour levels due to the proposal will be at or below the applied odour assessment criteria of 2 OU at all nearby sensitive or residential receptors.

The odour isopleths in **Figure 7-5** are generally rounded, and indicate that there are no significant drainage flows in any specific direction as expected given the area is relatively flat. The results are consistent with the expected terrain effects and prevailing winds.

Figure 7-5: Predicted 99th percentile-nose response average ground level odour concentrations from the proposal

7.6 Proposed Licence Limits

The proposed in-stack emission limit concentrations for the proposal are outlined in **Table 7-6**. The limits are consistent with best practice design limits for such plant. Note the proposed limits are set to include an allowance for normal plant performance degradation over time to ensure the proposal is capable of continually achieving the regulatory emission limits. Based upon the predicted incremental and cumulative impacts, the facility can meet these in-stack concentrations without any adverse air quality impacts.

Table 7-6: Proposed in-stack emission limit concentrations

Pollutant	Units	Pollutant concentrations	
		Max 1/2 hour average(1)	Max 24-hour average(1)
CO	mg/Nm^3	100	50
TOC	mg/Nm^3	20	10
$PM_{2.5}$	mg/Nm^3	28.5	4.8
PM_{10}	mg/Nm^3	29.4	4.9
TSP	mg/Nm^3	30	5
HCl	mg/Nm^3	60	6
HF	mg/Nm^3	4	1
$SO_2 + SO_3$	mg/Nm^3	200	30
NO_x (calculated as NO_2)	mg/Nm^3	400	120
NH3	mg/Nm^3	30	10
Hg	mg/Nm^3	0.035	0.02
Cd+Tl	mg/Nm^3	0.02	-
Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V	mg/Nm^3	0.3	-
Dioxins	ng/Nm^3	0.06	0.06

(1) Dioxins, HF and some metals are normally measured over 4 to 8 hour (or longer periods) in order to collect sufficient material to enable detection.

8 MITIGATION AND MANAGEMENT

The proposal has been designed to meet the European Industrial Emissions Directive (IED) (directive 2010/75/EU of the European Parliament) and fulfils the best available techniques (BAT) criteria as defined by the 37 BAT-conclusions in the *Commission Implementing Decision (EU) 2019/2010 Of 12 November 2019 Establishing The Best Available Techniques (BAT) Conclusions, Under Directive 2010/75/Eu Of The European Parliament And Of The Council, For Waste* Incineration (**EU Commission for WI, 2019**) which sets the European Union environmental standards for waste incineration.

The proposal has considered a range of Best Practice and Best Available Techniques (BAT) design features, mitigation and management measures to be applied to ensure a minimal impact.

Further assessment of Best Practice and Best Available Techniques (BAT) design features, mitigation and management measures is included in the Technical Report D Best Available Techniques Assessment.

In the event that there are any potential incidents or an equipment failure during the operation of the proposal, the facility would automatically carry out a shut-down in a controlled process to eliminate the potential for significant emissions to arise.

8.1 Plant design and pollution controls

The key components of the proposal that are involved in the mitigation of pollution will consist of:

- Waste receiving hall and bunker;
- Furnace with moving grate and boiler;
- Flue gas cleaning system and associated SNCR system;
- Continuous Emissions Monitoring System (CEMS); and,
- Stack.

These components individually assist in mitigating emissions and odour from the proposal and are discussed below.

8.1.1 Waste receiving hall and bunker

The waste receiving hall will be fully enclosed to contain odours from the waste tipping process and the bunker. To ensure odour is minimised, the waste receiving hall will include fast acting roller shutter doors and will operate under negative pressure. The air from the waste hall passes into the boiler, and fresh air is drawn in via louvres situated in the tipping hall under negative pressure.

Additional, visual inspections occur in the waste receiving hall to identify any inappropriate waste to be removed prior to combustion. It should be noted that any hazardous waste is explicitly excluded from the incoming waste stream and the proposal has implemented protocols to manage and mitigate any potential ‘rogue’ waste.

Waste feedstock is temporarily stored in the bunker. Overhead cranes are used to mix waste, extract any items that are out of specification, and load one of the two process lines via the feed hopper into the boiler. The active mixing of the waste by trained crane operators is a skilled task that is designed to increase the waste homogeneity, which assists to minimise operation fluctuations around the operational load point and in the load of pollutants and will thus minimise any variation in the emissions.

The waste bunker and tipping hall will also have an exhaust system equipped with an active carbon filter for odour control during stand still of the facility in order to mitigate odour escaping from the waste bunker and tipping hall if the boilers are not operating.

8.1.2 Furnace with moving grate and boiler

Waste undergoes combustion in the boiler where energy is converted into superheated steam that can be utilised for electricity production. The combustion system comprises a furnace with moving grate where the incineration process takes place and a boiler to utilise the heat generated from the process. The boiler has been designed to ensure it will be appropriate for the range of variable wastes used in the proposal. A schematic of the system is shown in **Figure 8-1**.

The system will include an advanced moving grate mass burn technology with the primary combustion air supplied from below the moving grate, heated before entering the furnace. Movement of the grate floor components will also agitate the waste to optimise complete combustion. Combustion on the grate will be controlled by feeding the combustion air through a number of dedicated combustion zones of the grate, to optimise complete combustion. Secondary combustion air shall be injected into the furnace/primary combustion chamber to ensure a complete burnout of the combustion gases.

The combustion air system will be equipped with dedicated ID-fans, one for each incineration line, with frequency-controlled drives to control the air volume to the individual combustion zones. Combustion air intake to each incineration line remains separate. The primary combustion air will be taken from the waste bunker and the secondary combustion air will be drawn from the top of the boiler hall. This ensures that negative air pressure in the bunker and waste receival hall is maintained and that the boiler hall has sufficient ventilation via incoming fresh air to minimise odour from the bunker.

The boiler design ensures complete combustion and sufficient cooling of combustion gases and particles in the radiation passes before entering the convection section to minimise this risk of corrosion and blockage of the internal pipes of the convection pass.

The convection pass rapidly cools down the flue gas to an appropriate temperature. The design and the sequence of the superheater packages is important to minimise the potential de-novo formation of dioxins, and also to minimise potential corrosion and ensure enough superheating of the steam. In between the superheater sections, water injections in the steam are used to control the temperature of the steam.

A condensing type steam turbine will be installed that uses an air-cooled condenser (ACC) to condense the excess, unusable steam from the boiler into feedwater for reuse in the boiler.

Auxiliary burners will be installed for use during start-up/shut-down conditions and will utilise diesel fuel that will be stored in bunded tanks on-site. The auxiliary burners will fire to ensure that under all conditions (even the most unfavourable) the minimum temperature of 850°C is maintained for any solid waste combustion, as per the NSW Energy from Waste Policy Statement.

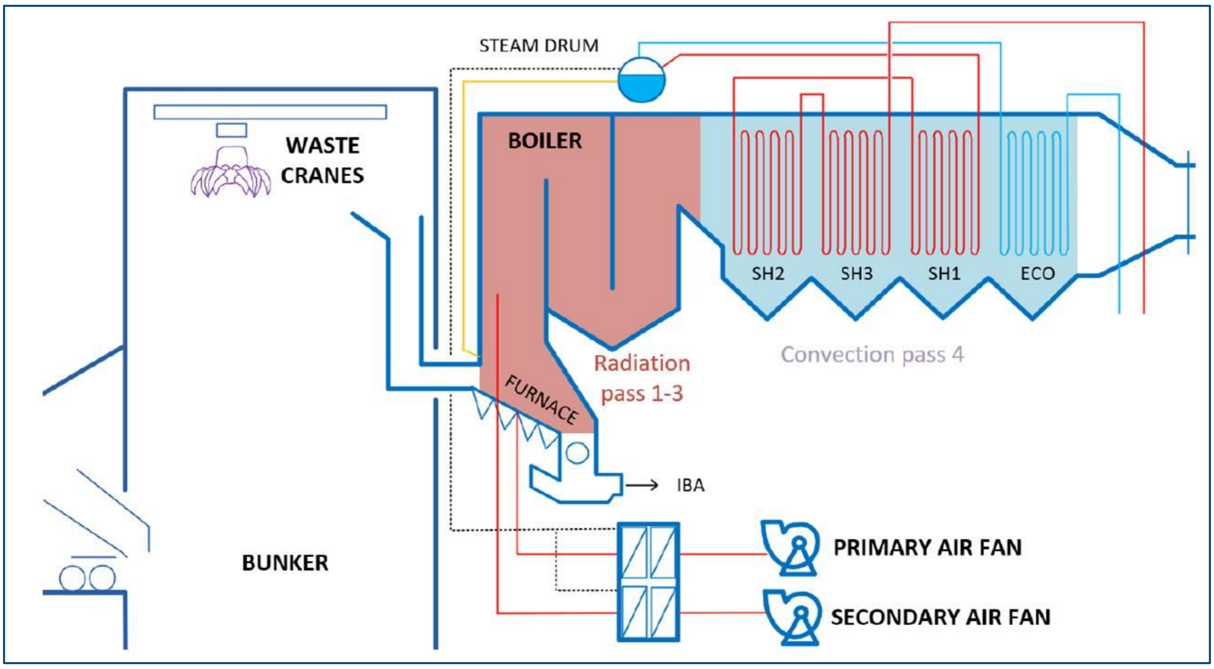

Figure 8-1: Boiler configuration

8.2 Flue gas cleaning system

The proposal will be equipped with a semi dry flue gas treatment system with a wet scrubber comprising bag filters, carbon injection and lime injection and a post flue gas polishing scrubber to minimise emissions of dust, NO_x, acidic gases, heavy metals and dioxins and furans. A schematic of the flue gas cleaning system is provided in **Figure 8-2**.

8.2.1 Selective non-catalytic reduction (SNCR)

The proposal will equip the use of a SNCR system to mitigate nitrogen oxides (NO_x). Ammonia is injected into the first pass of the boiler. This allows for the NO_x to react with the ammonia, converting NO_X into free nitrogen (N_2) and water. Using a SCNR system ensures that the proposal can achieve emissions of NO_X below the expected regulatory emission limits.

8.2.2 Reactor

Hydrated lime and activated carbon is injected into the flue gas stream in the reactor by which acidic flue gases (i.e.: HCl, SO_2 and HF) are absorbed and separated from the flue gas as the corresponding calcium salts together with fly ash from the incineration, and heavy metals and dioxins and furans are captured. Water is injected with the hydrated lime and activated carbon prior to introduction to the flue gas, to optimise the reactivity of the lime and to cool the flue gases to an appropriate temperature.

8.2.3 Bag house filter

The bag house filter removes the mixture of activated carbon, excess hydrated lime and fly ash, as well as the former mentioned reaction products from the exhaust flue gas from the reactor that have been absorbed by the reagents. These residuals are safely and securely stored before collection and transportation off-site for disposal at a licenced facility.

The lime and activated carbon continue to be active upon the surface of the bag filter, until they are cleaned off via the automated bag cleaning process.

8.2.4 Wet scrubber

The wet scrubber uses water and injection of sodium hydroxide (NaOH) to absorb the majority of the remaining acidic gases, particles, heavy metals and excess ammonia from the SNCR system into the scrubbing fluid. Water is injected to cool the gas at the entry to the scrubber, and the liquid residue from the scrubber is re-used in the reactor.

8.3 Continuous Emissions Monitoring System

Each grate line will be equipped with a Continuous Emissions Monitoring System (CEMS) to allow for continuous monitoring of the flue gas to ensure the proposal is compliant with the licence limits. This also assists in providing real time feedback to the control systems to make automatic adjustments to the combustion system and the injection rates for the flue gas cleaning system process.

Continuous monitoring will be installed for all pollutants that must be continuously monitored including NO_x, CO, Particulates, TOC, HCl, NH3, Hg and SO2, in addition to spot sampling of HF.

For pollutants with levels below limits of detection routine sampling and testing will be established as to ensure that the facility complies with its environmental obligations. Auxiliary parameters such as flow rate, temperature, pressure, moisture content, oxygen and CO_2 will also be measured as part of the CEMS.

Real-time emission data from the CEMS will be available in real-time to the EPA, and online to the public or other authorities as required in any license to operate.

8.4 Stack

The stack is used to disperse the cleaned flue gases from the proposal. The stack parameters are set out in **Section 6.4** and show that the design allows for good dispersion of emissions to minimise risk at ground level.

8.5 Ash management

Incinerator Bottom Ash (IBA) remaining after the combustion process is discharged into a water bath and quenched. The wet IBA is deposited onto a conveying system and will be recovered for any bulky items or ferrous metal materials. Following metals recovery, the residual bottom ash is securely stored before transported off-site for recycling or disposal at a licensed facility.

Boiler Fly Ash is controlled via the flue gas cleaning system and the Flue Gas Treatment residues (FGTr) which comprises the residual ash and spent reagents from the flue gas cleaning system is collected in the bag house filter.

Ash residue will be handled in sealed conditions within the facility. Due to the mitigation measures in place there is minimal risk of any dust from the handling and storage of ash entering the environment.

8.6 Fugitive emissions

Fugitive odour emissions from the proposal potentially arising from trucks delivering waste and collecting residue are expected to be mitigated with waste transported to or from the facility in fully enclosed vehicles.

As mentioned, the waste receiving hall and waste bunker will be fully enclosed with fast acting roller shutter doors and will operate under negative pressure to contain fugitive odour emissions. The waste bunker and tipping hall will also have an exhaust system equipped with an active carbon filter for odour control during stand still of the facility in order to mitigate odour escaping from the waste bunker and tipping hall if the boilers are not operating.

8.7 Proposed monitoring

The plant would undertake extensive monitoring during the commissioning phase to ensure that all systems are functioning correctly before commencing normal operations.

As part of the commissioning testing, a wide range of substances will be analysed, as a minimum all substances considered in this assessment, however the suite of metals and other compounds tested by spot samples in a laboratory will almost certainly include the full suite of substances that the laboratory is able to analyse.

Thereafter it is proposed to conduct regular (e.g. quarterly or as otherwise required) testing of all substances that may have scope for exceeding criteria or licence limits, and that are not already measured via the CEMs system.

Continuous monitoring will be installed for all pollutants that must be continuously monitored including NO_x, CO, Particulates, TOC, HCl, NH_3, Hg and SO_2, in addition to frequent spot sampling of HF. Auxiliary parameters such as flow rate, temperature, pressure, moisture content, oxygen and CO_2 will also be measured as part of the CEMS.

Selected substances measured by the CEMS system will however continue to be tested regularly as required to ensure valid, correct operation of the CEMS system, for example NO_2, CO and Particulates.

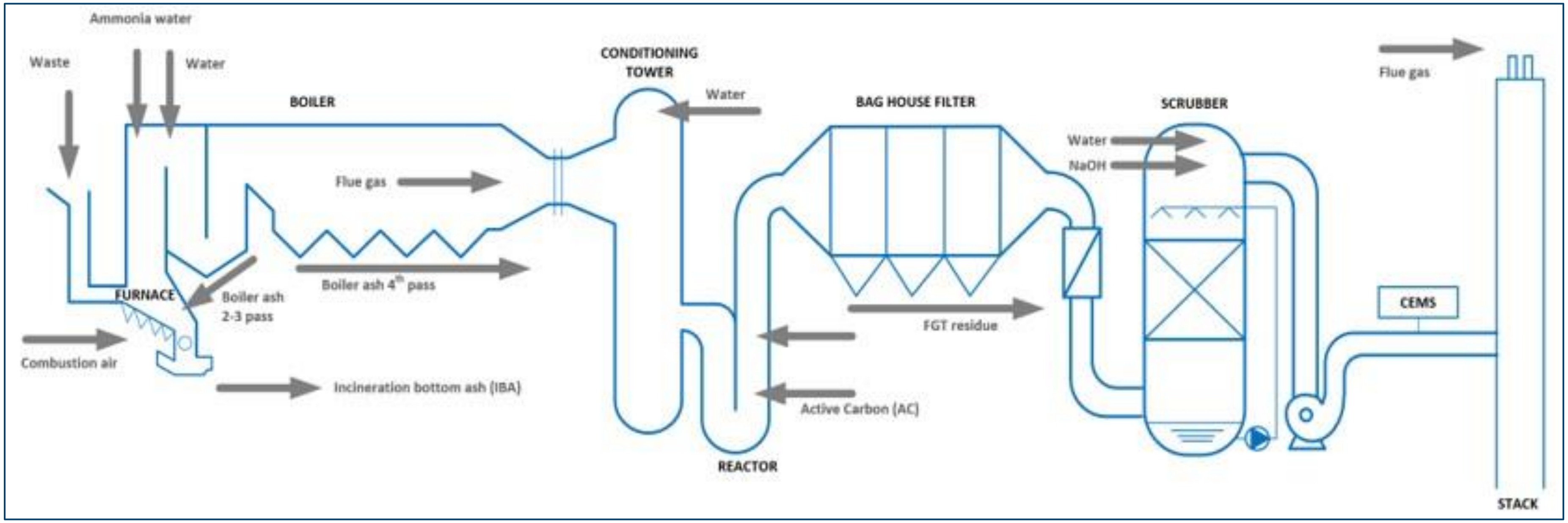

Figure 8-2: Flue gas cleaning system

9 SUMMARY AND CONCLUSIONS

This report has assessed the potential air quality impacts associated with the proposal to build an energy-from-waste (EfW) facility which will involve the thermal processing of residual municipal solid waste (MSW) and residual commercial and industrial (C&I) waste material at Eastern Creek, NSW.

Air dispersion modelling was used to predict the potential for off-site impacts in the surrounding area due to the operation of the proposal. The estimated emissions of pollutants and background air quality levels applied in the modelling are likely to be conservative and would overestimate the actual impacts.

The results indicate that for all assessed pollutants, the predicted incremental ground level pollutant concentrations due to the proposal at the assessed receptor locations and beyond the boundary are expected to be low.

All of the air pollutant results are below the applicable criteria, except for PM_{10} and $PM_{2.5}$, due to the existing background levels already exceeding the criteria. However, as the maximum incremental levels from the proposal are predicted to be small, the emissions from the proposal would not result in any additional days over the criteria.

The results indicate that deposited dust levels in the vicinity of Prospect Reservoir would be too low to discern or measure.

The results indicate that odour emissions from the proposal would be below the applicable odour impact assessment criteria and would not contribute any tangible amount to cumulative odour levels in the vicinity.

The proposal would install and operate appropriate best practice flue gas treatment systems and will apply mitigation measures to ensure it minimises the potential occurrence of excessive air emissions and odours from the site.

Overall, the assessment demonstrates that the proposal can operate without causing any significant air quality impact at receptors or locations at or beyond the proposal boundary.

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Appendix A
Selection of Meteorological Year

Selection of meteorological year

A long-term analysis of the last six contiguous years of meteorological data from the nearest BoM weather station with suitable available data, Horsley Park Equestrian Centre (AWS) weather station, is presented in **Table A-1**. The standard deviation of the last six years of meteorological data spanning 2014 to 2019 was analysed against the long-term measured wind speed, temperature and relative humidity spanning an approximate 13 to 22-year period recorded at this station.

The analysis would factor in consideration of climate change conditions that have occurred in recent years and is expected to select a suitable representative year from the available meteorological data from Horsley Park Equestrian Centre (AWS) weather station.

The analysis indicates that 2018 is closest to the long-term average for wind speed, 2014 is closest to the long-term average for temperature and 2015 is closest to the long-term average for relative humidity.

For an overall score, wind speed was given a weighting of two and temperature and humidity a weighting of one. Overall, this analysis indicates that 2015 is the most representative year on the basis of long-term measured wind speed, temperature and relative humidity (weighted 2:1:1).

Table A-1: Statistical analysis results for Horsley Park Equestrian Centre AWS

Year	Wind speed	Temperature	Relative humidity	Weighted Score
2014	0.78	0.63	4.04	6.24
2015	0.90	0.73	2.64	5.17
2016	0.84	0.88	4.96	7.53
2017	0.71	0.84	5.18	7.45
2018	0.62	0.92	6.98	9.14
2019	0.80	0.86	5.54	7.99

Additional analysis into available monitoring data from the NSW OEH Prospect site was used to determine the most representative year. The monitoring data from the NSW OEH Prospect site are considered to be representative of the area surrounding the proposal site as a result of monitoring conducted over a three month period near the proposal which found that ambient air quality levels near the proposal overall had sufficiently good correlation to monitoring data available from the NSW OEH Prospect site.

The analysis found that 2014 did not have a suitable dataset available and was thus determined not to be a suitable representation year. Furthermore, the 2019 dataset at Prospect was considered to not be suitable due to containing significantly elevated concentrations as a result of a number of regional dust storms and bushfires.

Analysis into the other four years (2015 to 2018) found the 2015 dataset as a suitable dataset which contained sufficient data, corresponded well with the monitoring datasets from the other years.

Thus 2015 is to be the most representative year on the basis of long-term measured wind speed, temperature and relative humidity and monitoring data.

Figure A-1 shows the frequency distributions for wind speed, wind direction, temperature and relative humidity for the 2015 year compared with the mean and range of the 2014 to 2018 data set. The 2015 year data does not indicate any significant variation of the last five years of data.

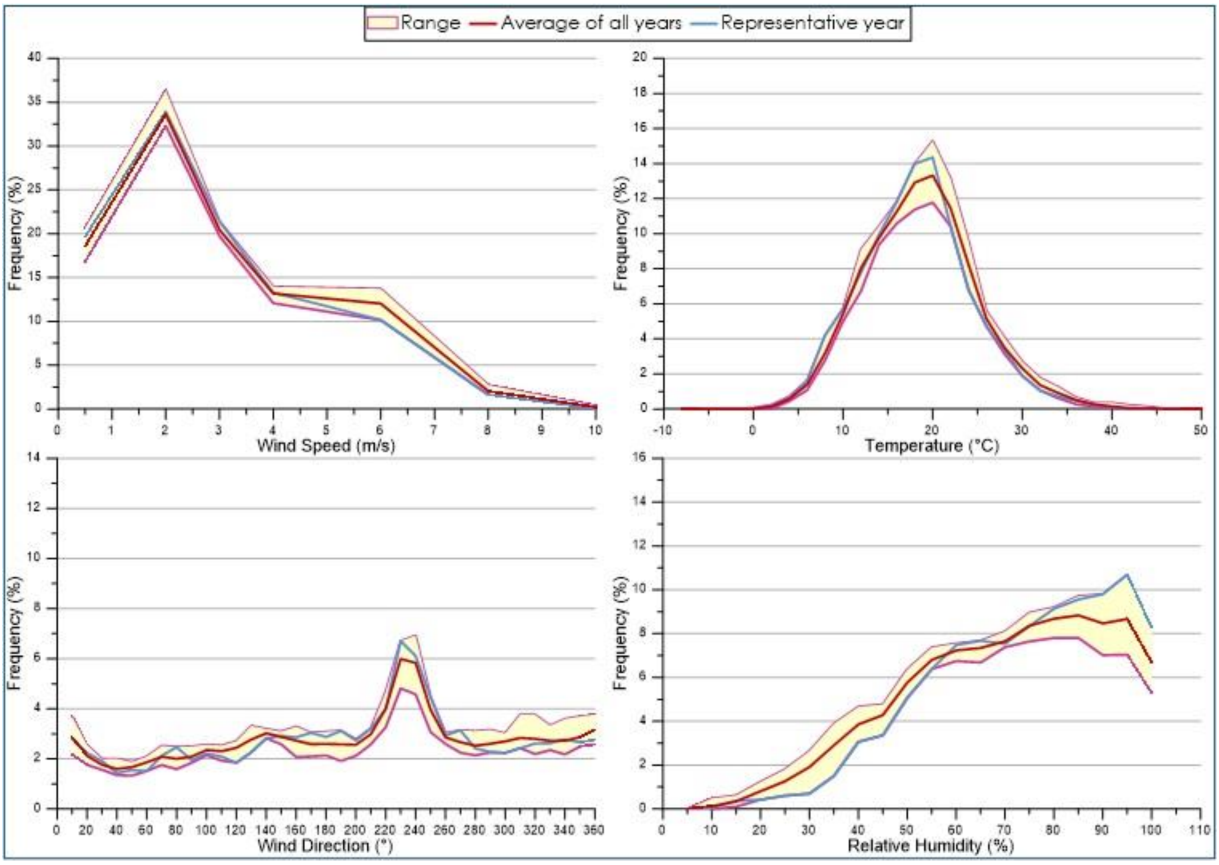


Figure A-1: Frequency distributions for wind speed, wind direction, temperature and relative humidity

Appendix B
Proposal Monitoring

Proposal Monitoring

Particulate matter (including $PM_{2.5}$ and PM_{10}) and gaseous pollutants (including SO_2, NO, NO_2 and CO) were measured at 10-minute and 15-minute averages, respectively. The siting of the equipment complies with satisfied the *Australian Standard AS/NZS 3580.1.1:2007 - Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment (***Joint Technical Committee, 2007**).

Table B-1 presents a summary for the monitoring period.

The 24-hour averaged $PM_{2.5}$ and PM_{10} data and the 1-hour averaged SO_2, NO, NO_2 and CO data for the montoring period is displayed graphically in **Figure B-1** to **Figure B-6**, respectively.

During the monitoring period it is noted that the greater NSW region experienced widespread bushfires that contributed to the elevated ambient pollutant levels. The effect of the bushfires are seen in the measured $PM_{2.5}$ and PM_{10} data (refer to **Figure B-1** and **Figure B-2**) which indicate a number of 24-hour average periods which recorded levels above the relevant criteria. The proximity of any of the sites to the plume of smoke on any day will afect the maximum PM_{10} and $PM_{2.5}$ result.

The results show that the monitoring data recorded at the locations near the proposal are generally consistent with the monitoring data recorded at St Marys and Prospect monitoring stations. The similarities between the trends in the measured levels at the monitoring sites suggests that these locations are predominantly influenced by regional air quality levels.

There does not appear to be any very dominant localised air pollution sources which strongly influence either of the proposal monitoring locations. Emissions from roads may bias NO_2 levels to some degree, noting that the sites furthest upwind or crosswind of major roads have the lowest NO_2 readings, and there is some expected bias evident in the SO_2 levels due to the nearby brick making plants.

We note that there are differences in measurement techniques between the DPIE monitors and the DustTrak and AQMesh monitoring systems which also account for some of the differences in the measured concentrations. It can be seen in **Table B-1** that the DPIE monitors recorded a higher proportion of low and negative results relative to the values recorded at the proposal locations. This is attributed to differences in the measurement technique and data handling procedures, and the differing effects of bushfire pollutants on how the equipment makes readings.

Overall, the data recorded at the monitoring locations for the proposal is found to be generally consistent with the monitoring data recorded at St Marys and Prospect DPIE monitoring stations, acknowledging that the differences as outlined above are normal and arise due to expected factors.

As there is no significant, unaccountable factor that for the differences in the background data at the monitored locations relative to the DPIE data, it means that the long term DPIE data can be used in the assessment of impacts at the locations likely to be most affected by the proposal.

Table B-1: Summary of proposal and DPIE data over the monitoring period (µg/m³)

a	Location 1	Location 2	St Mary	Prospect	Criteria
	3 Month Average				
PM_{10}	51.6	51.0	49.0	48.3	-
$PM_{2.5}$	31.3	30.4	22.1	23.9	-
SO_2	3.1	3.3	-	2.0	-
NO_2	11.9	10.5	6.9	12.5	-
NO	3.1	4.1	1.1	3.3	-
CO	215.3	222.7	-	229.6	-
	Maximum 1-hour Average				
PM_{10}	-	-	-	-	-
$PM_{2.5}$	-	-	-	-	-
SO_2	30.9	33.0	-	48.5	**570**
NO_2	67.7	56.9	63.6	100.5	**246**
NO	48.1	86.4	49.6	103.2	-
CO	2,627.9	2,654.9	-	6,875.0	**30,000**
	Maximum 24-hour Average				
PM_{10}	289.9	276.6	159.8	182.8	**50**
$PM_{2.5}$	193.8	184.1	88.3	134.1	**25**
SO_2	9.4	8.5	-	10.8	**228**
NO_2	-	-	-	-	-
NO	-	-	-	-	-
CO	-	-	-	-	-
	Percentage of data less than or equal to zero				
PM_{10}	0%	0%	0%	0%	-
$PM_{2.5}$	0%	0%	0%	0%	-
SO_2	5%	4%	-	61%	-
NO_2	<1%	1%	27%	19%	-
NO	<1%	4%	64%	57%	-
CO	<1%	0%	-	39%	-
	Percentage of no data recorded				
PM_{10}	0%	0%	2%	0%	-
$PM_{2.5}$	0%	0%	8%	1%	-
SO_2	<1%	3%	-	8%	-
NO_2	<1%	3%	13%	8%	-
NO	<1%	3%	13%	8%	-
CO	<1%	3%	-	8%	-

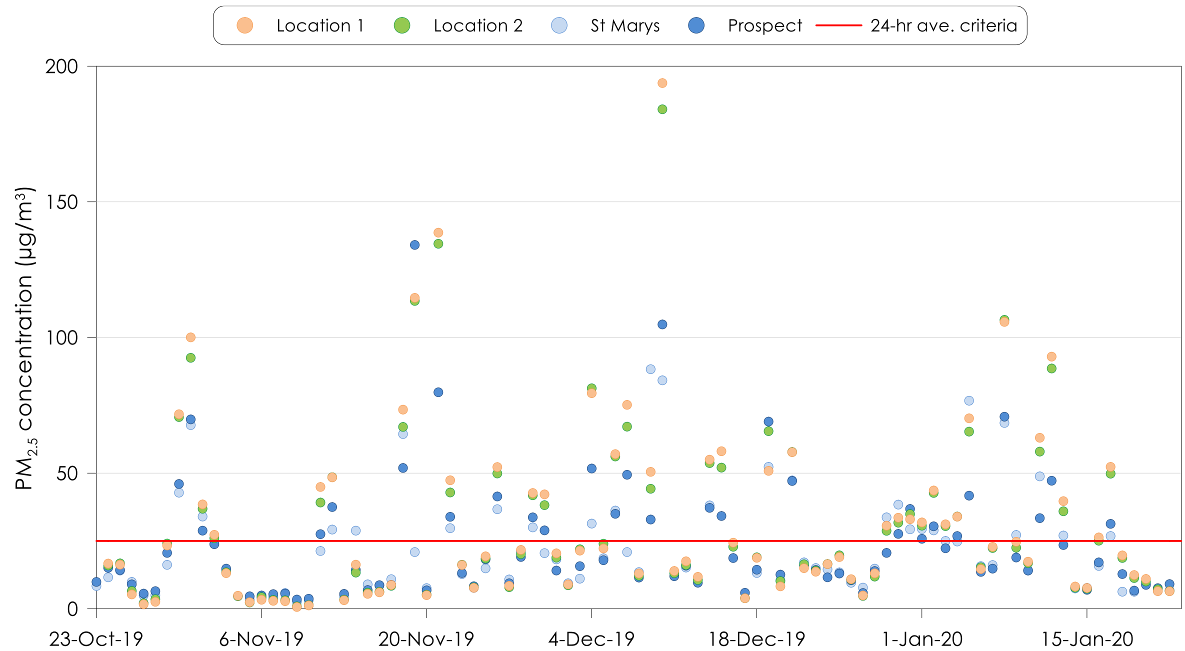


Figure B-1: 24-hour average $PM_{2.5}$ concentrations

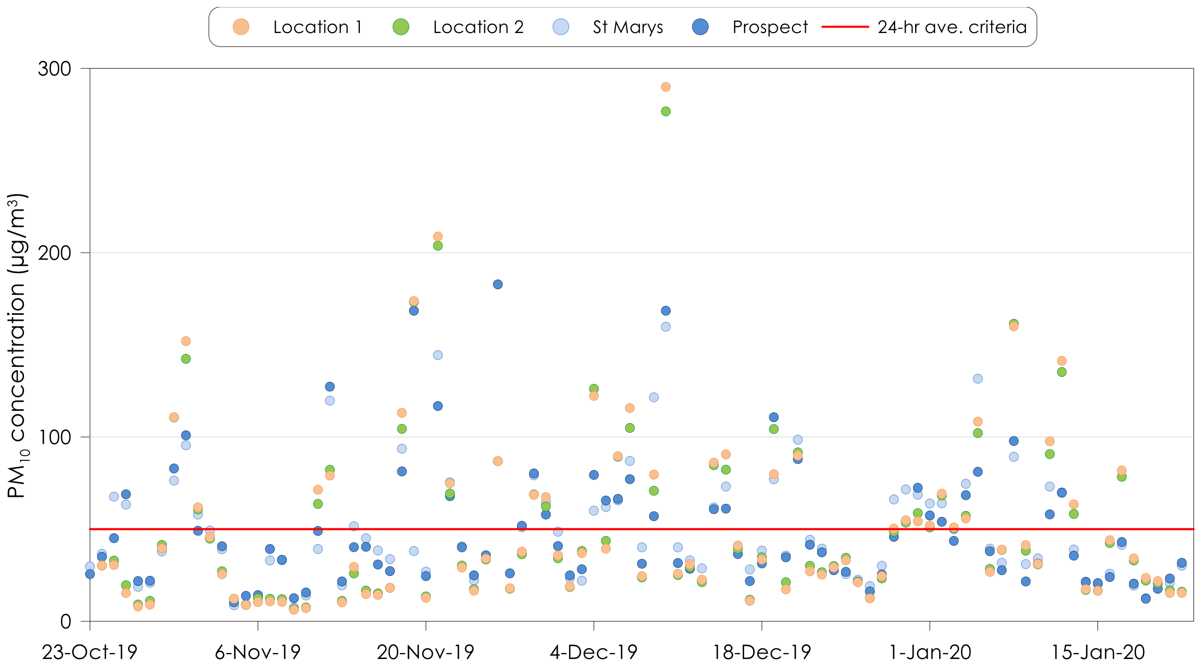


Figure B-2: 24-hour average PM_{10} concentrations

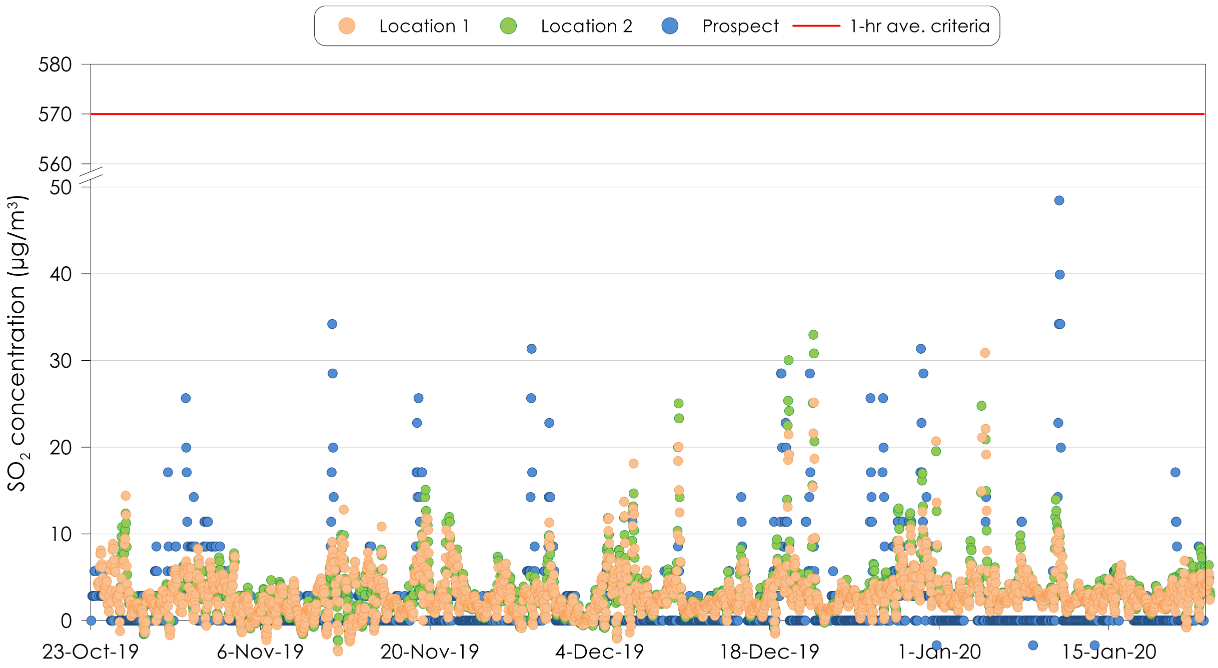


Figure B-3: 1-hour average SO_2 concentrations

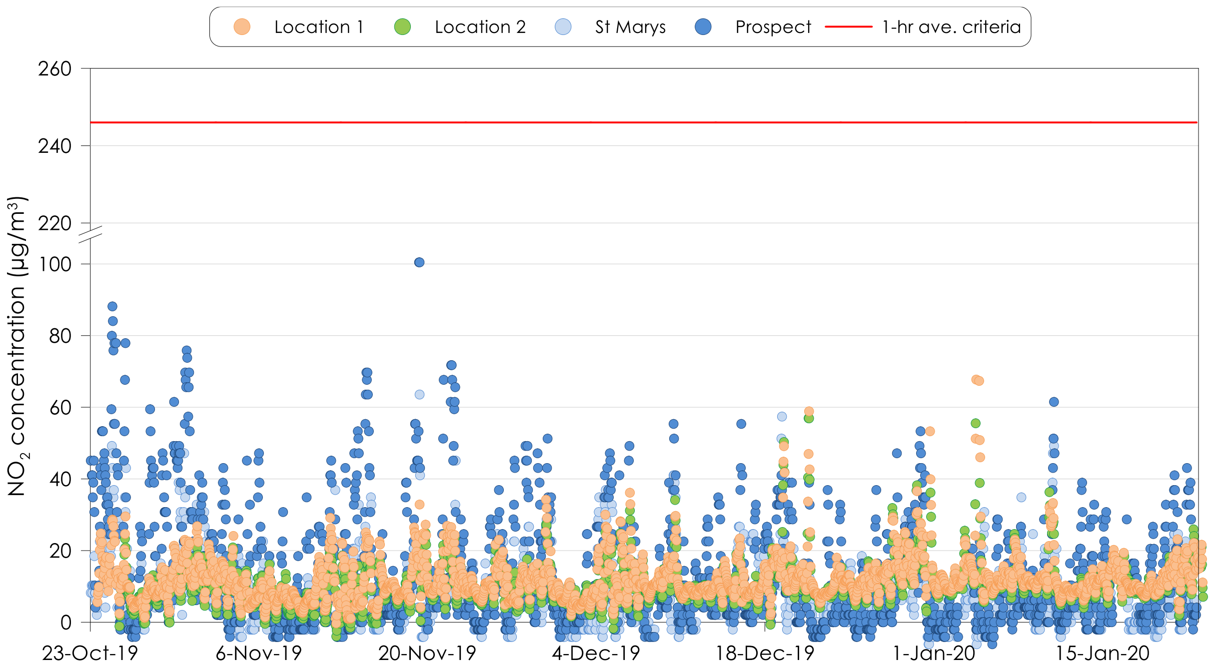


Figure B-4: 1-hour average NO_2 concentrations

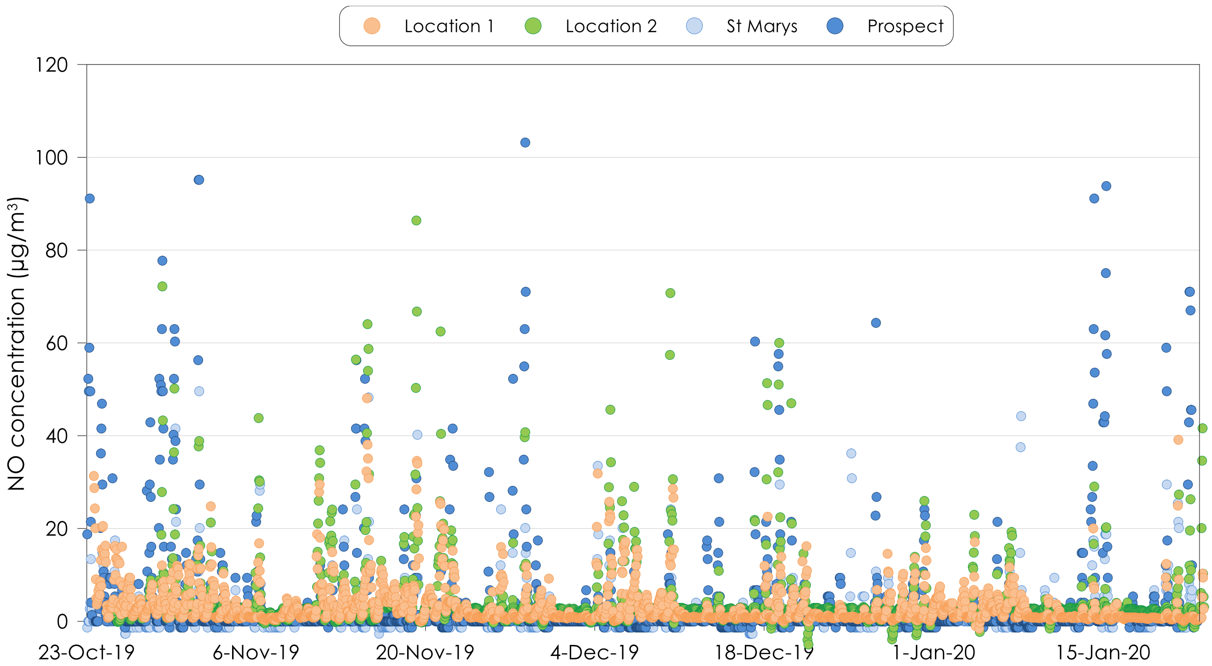


Figure B-5: 1-hour average NO concentrations

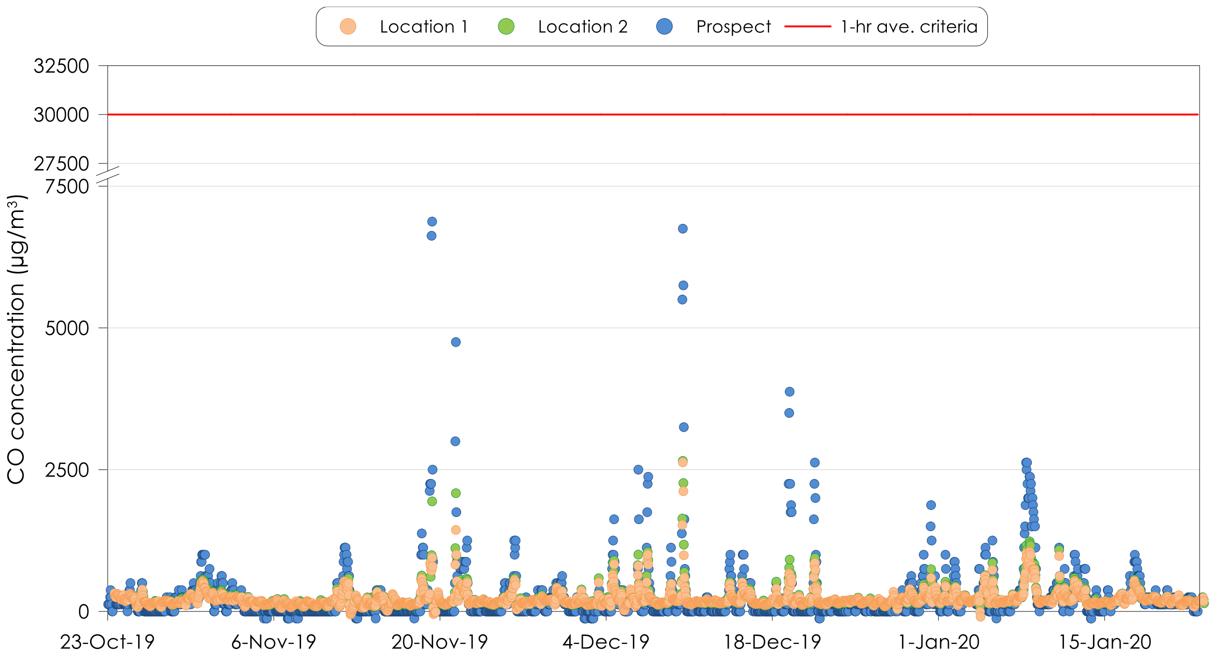


Figure B-6: 1-hour average CO concentrations

Appendix C

Isopleth Diagrams

Scenario 1

Figure C-1: SC1 - Predicted incremental relative 100th percentile annual average $PM_{2.5}$ glc concentrations (µg/m³)

Figure C-2: SC1 - Predicted incremental relative 100th percentile annual average PM_{10} glc concentrations (µg/m³)

Figure C-3: SC1 - Predicted incremental relative 100th percentile annual average TSP glc concentrations (µg/m³)

Figure C-4: SC1 - Predicted incremental relative 100th percentile annual average Deposition glc concentrations (g/m²/month)

Figure C-5: SC1 - Predicted incremental relative 100th percentile annual average SO_2 glc concentrations (µg/m³)

Figure C-6: SC1 - Predicted incremental relative 100th percentile annual average NO_2 glc concentrations (µg/m³)

Figure C-7: SC1 - Predicted cumulative relative 100th percentile annual average $PM_{2.5}$ glc concentrations (µg/m³) – without contributions from the Next Generation energy to waste facility

Figure C-8: SC1 - Predicted cumulative relative 100th percentile annual average PM_{10} glc concentrations (µg/m³) – without contributions from the Next Generation energy to waste facility

Figure C-9: SC1 - Predicted cumulative relative 100th percentile annual average TSP glc concentrations (µg/m³) – without contributions from the Next Generation energy to waste facility

Figure C-10: SC1 - Predicted cumulative relative 100th percentile annual average Deposition glc concentrations (g/m²/month) – without contributions from the Next Generation energy to waste facility

Figure C-11: SC1 - Predicted cumulative relative 100th percentile annual average SO_2 glc concentrations (µg/m³) – without contributions from the Next Generation energy to waste facility

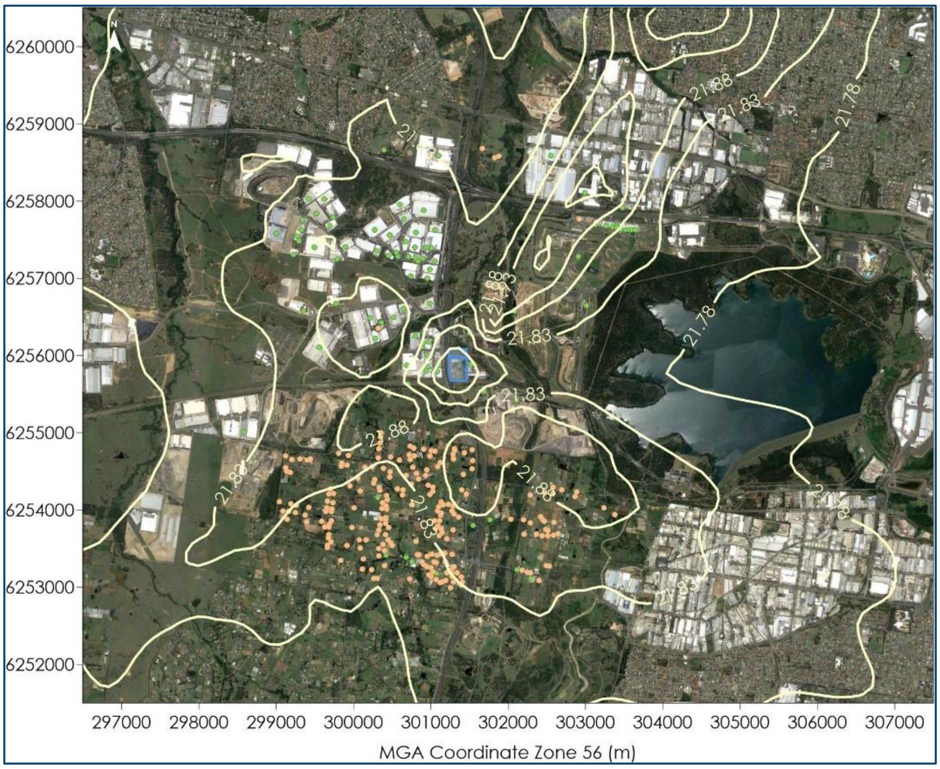


Figure C-12: SC1 - Predicted cumulative relative 100th percentile annual average NO_2 glc concentrations (µg/m³) – without contributions from the Next Generation energy to waste facility

Figure C-13: SC1 - Predicted cumulative relative 100th percentile annual average $PM_{2.5}$ glc concentrations (µg/m³) – with contributions from the Next Generation energy to waste facility

Figure C-14: SC1 - Predicted cumulative relative 100th percentile annual average PM_{10} glc concentrations (µg/m³) – with contributions from the Next Generation energy to waste facility

Figure C-15: SC1 - Predicted cumulative relative 100th percentile annual average TSP glc concentrations (µg/m³) – with contributions from the Next Generation energy to waste facility

Figure C-16: SC1 - Predicted cumulative relative 100th percentile annual average Deposition glc concentrations (µg/m³) – with contributions from the Next Generation energy to waste facility

Figure C-17: SC1 - Predicted cumulative relative 100th percentile annual average SO_2 glc concentrations (µg/m³) – with contributions from the Next Generation energy to waste facility

Figure C-18: SC1 - Predicted cumulative relative 100th percentile annual average NO_2 glc concentrations (µg/m³) – with contributions from the Next Generation energy to waste facility

Scenario 2

LP1 **Max LP**

Figure C-19: SC2 - Predicted incremental relative 100th percentile 24-hour average $PM_{2.5}$ glc concentrations (µg/m³)

LP1

Max LP

Figure C-20: SC2 - Predicted incremental relative 100th percentile 24-hour average PM_{10} glc concentrations (µg/m^3)

LP1

Max LP

Figure C-21: SC2 - Predicted incremental relative 100th percentile 24-hour average HF glc concentrations (µg/m³)

LP1

Max LP

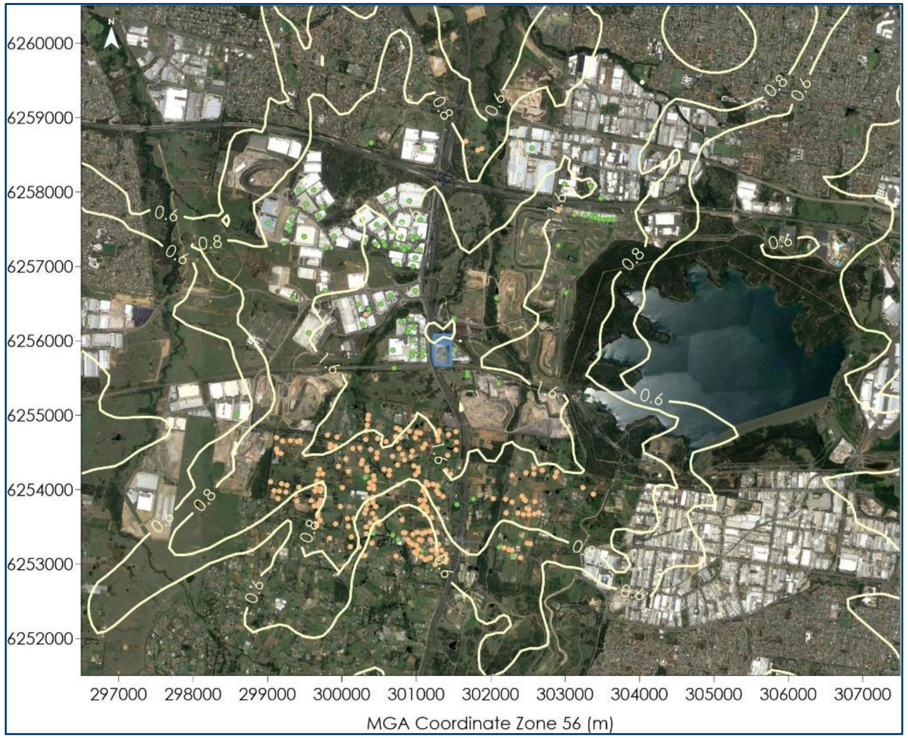


Figure C-22: SC2 - Predicted incremental relative 100th percentile 24-hour average SO_2 glc concentrations (µg/m³)

Scenario 3

LP1 **Max LP**

Figure C-23: SC3 - Predicted incremental relative 100th percentile 1-hour average CO glc concentrations (µg/m³)

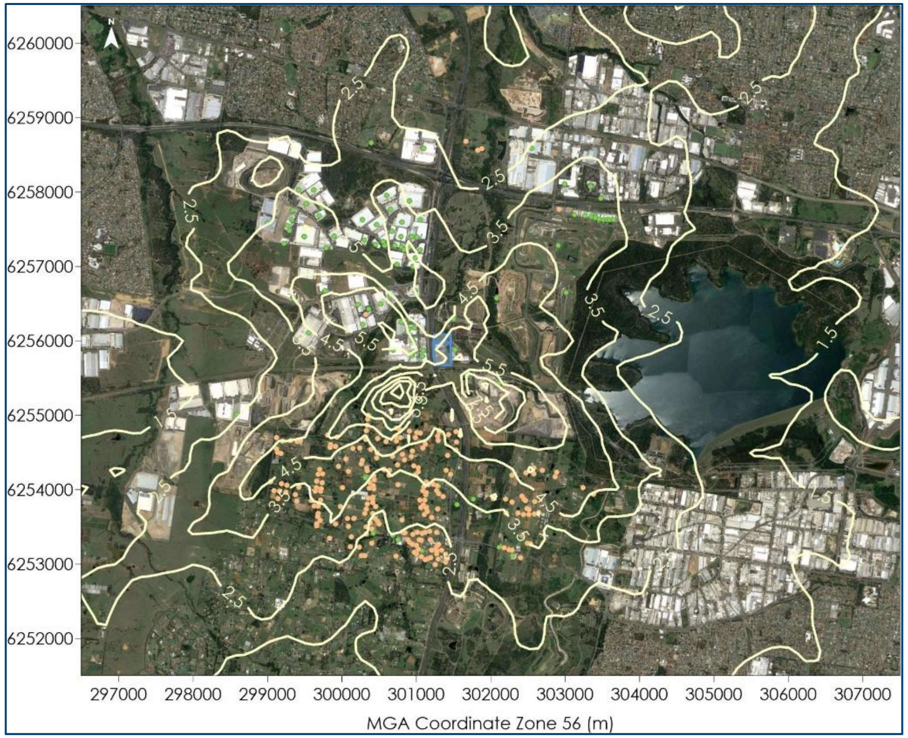
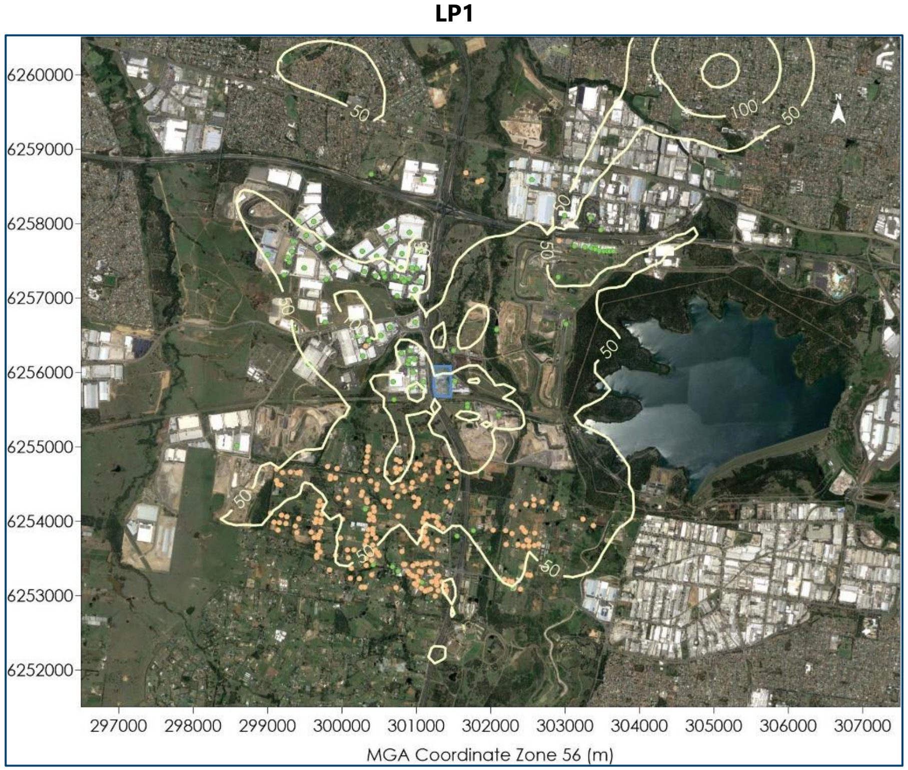


Figure C-24: SC3 - Predicted incremental relative 99.9th percentile 1-hour average TOC glc concentrations (µg/m³)

LP1

Max LP

Figure C-25: SC3 - Predicted incremental relative 99.9th percentile 1-hour average HCl glc concentrations (µg/m³)



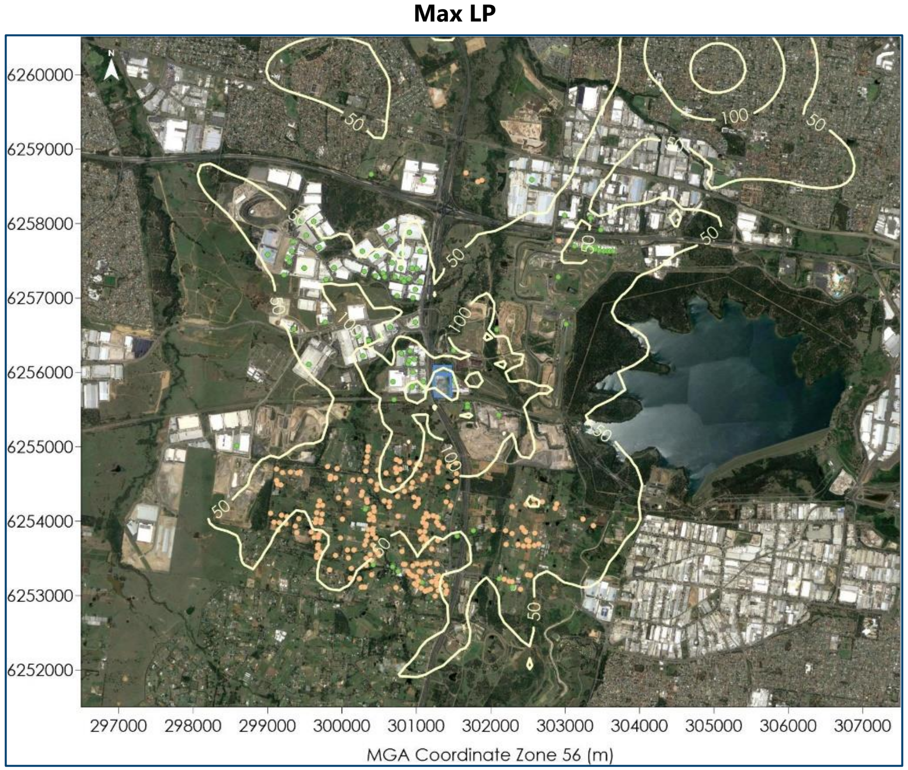
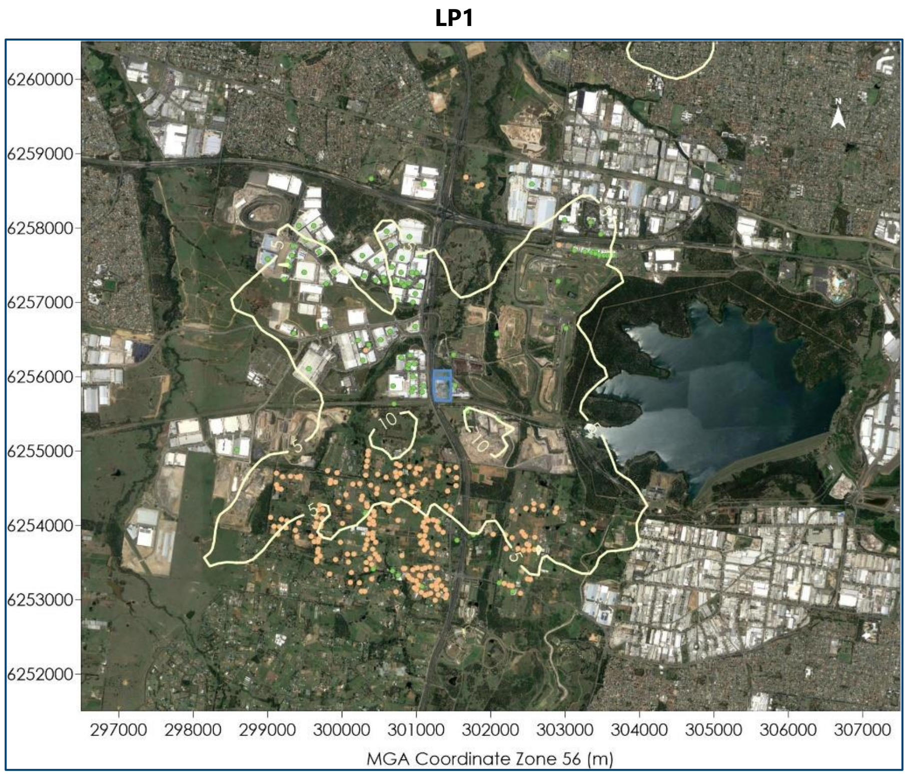


Figure C-26: SC3 - Predicted incremental relative 100th percentile 1-hour average SO_2 glc concentrations (µg/m³)

LP1

Max LP

Figure C-27: SC3 - Predicted incremental relative 100th percentile 1-hour average NO_2 glc concentrations (µg/m^3)



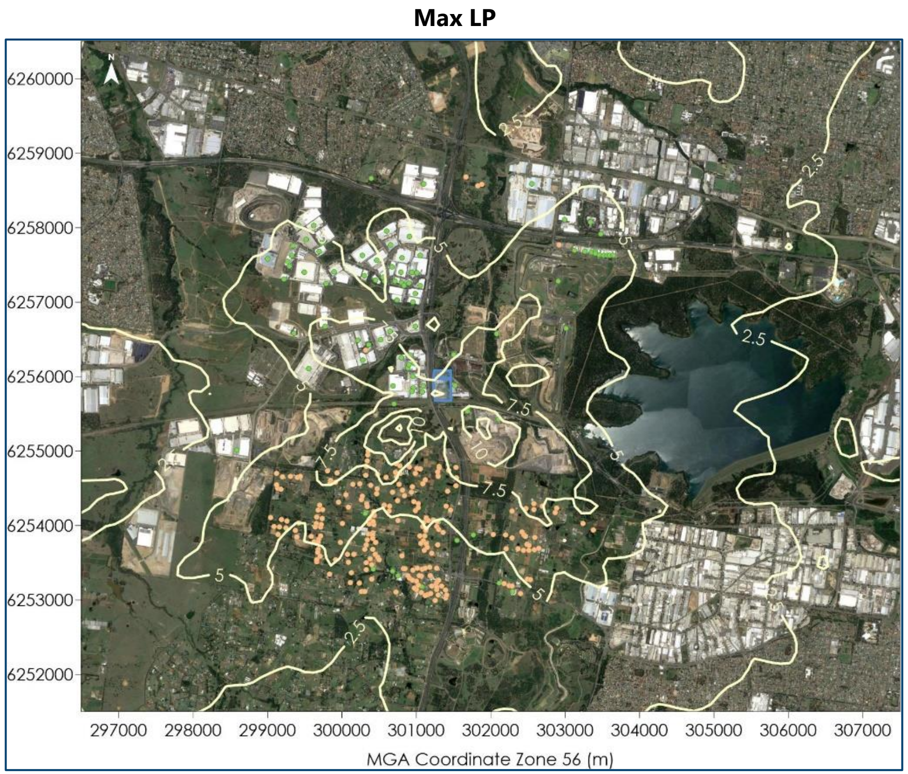


Figure C-28: SC3 - Predicted incremental relative 99.9th percentile 1-hour average NH_3 glc concentrations ($\mu g/m^3$)

Figure C-29: SC3 - Predicted incremental relative 99.9th percentile 1-hour average Hg glc concentrations (µg/m³)

LP1

Max LP

Figure C-30: SC3 - Predicted incremental relative 99.9th percentile 1-hour average Cd + Tl glc concentrations (µg/m³)

LP1

Max LP

Figure C-31: SC3 - Predicted incremental relative 99.9th percentile 1-hour average Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V glc concentrations (µg/m³)

LP1

Max LP

Figure C-32: SC3 - Predicted incremental relative 99.9th percentile 1-hour average Dioxins glc concentrations (µg/m³)

Scenario 4

Figure C-34: SC4 - Predicted incremental relative 100th percentile 24-hour average $PM_{2.5}$ glc concentrations (µg/m³)

Figure C-35: SC4 - Predicted incremental relative 100th percentile 24-hour average PM_{10} glc concentrations (µg/m³)

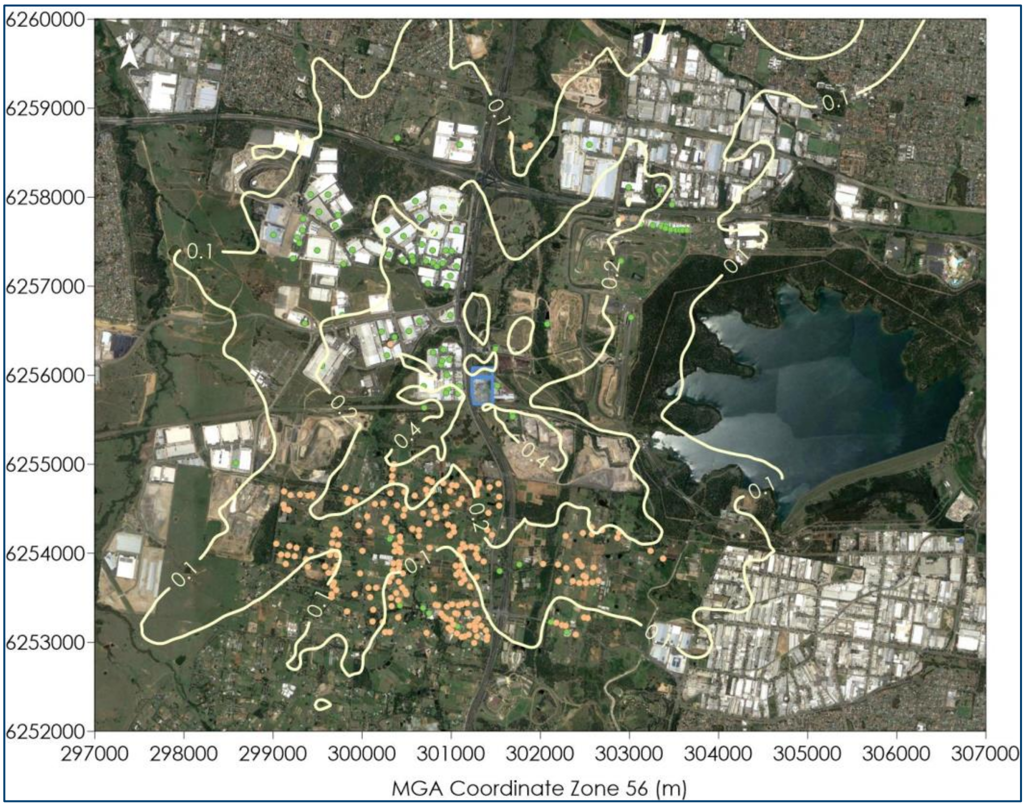


Figure C-36: SC4 - Predicted incremental relative 100th percentile 24-hour average HF glc concentrations (µg/m³)

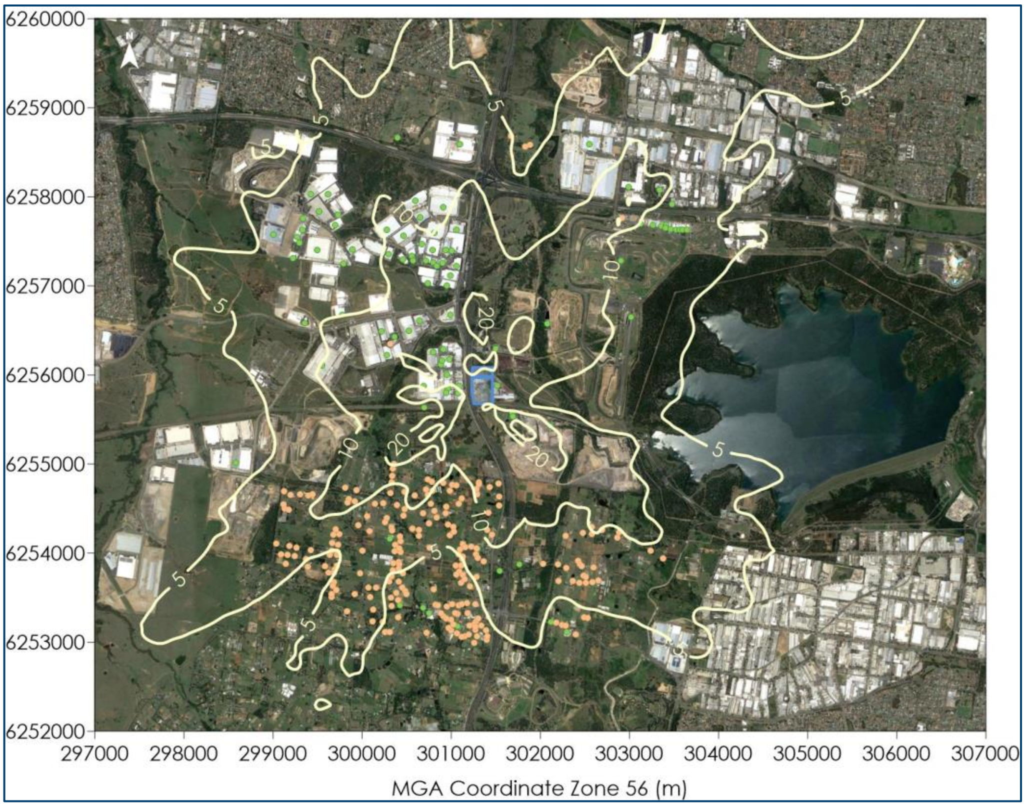


Figure C-37: SC4 - Predicted incremental relative 100th percentile 24-hour average SO_2 glc concentrations (µg/m³)

Appendix D

Receptor list

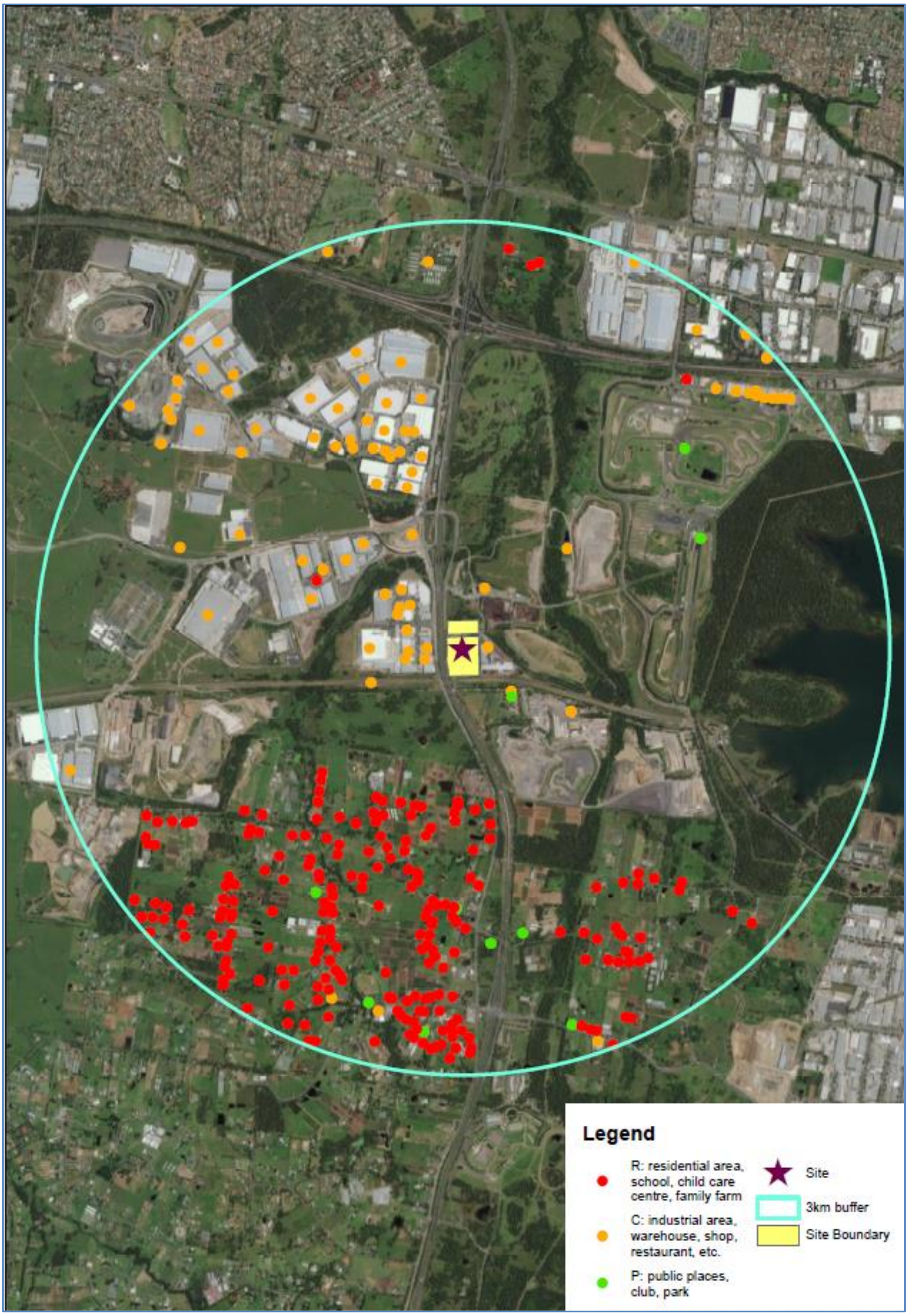


Figure D-1: Receptor Map

Table D-1: Receptor list

Receptor ID	X	Y	Name	Type	Label	Lot
1	300318	6256353	Little Graces Childcare Centre	Child Care Centre	R	2/DP270876
2	301767	6253873	Baulkham Hills Junior Motorcycle Training Club Inc Blacktown Junior Mini Bike Club	Club	P	113/DP13905
3	302114	6253229	UR Ashur Club	Club	P	D/DP398446
4	300683	6253384	Horsley Park Community Hall	Community Centre	P	2/DP347616
5	300900	6257254	Tower Projects	Construction company	C	2182/DP1222760
6	300395	6258664	Pinegrove Memorial Park	Cremation service	C	2/DP225395
7	300004	6254026	172-176 Delaware Rd	Farm	R	B/DP408710
8	299304	6254660	263-273 Burley Rd	Farm	R	3/DP225031
9	299131	6254500	313 Burley Rd	Farm	R	6/DP225031
10	301881	6258585	47 Pikes Ln	Farm	R	3E/DP436196
11	301000	6253138	Borella Eggs	Farm	R	A/DP364834
12	300963	6254321	133 Walworth Road	Farm	R	6/DP706864
13	301395	6253028	Barter & Sons Hatchery co	Farm	R	1/DP1087334
14	302594	6253841	203 Redmayne Rd	Farm	R	A/DP347034
15	301829	6258564	51 Pikes Lane, Eastern Creek	Farm	R	A/DP323854
16	302918	6257767	Alpha Hotel Eastern Creek	Hotel	R	1/DP1079897
17	300421	6253417	9 Arundel Rd	Industrial	C	3/DP1161205
18	300793	6257404	Costa Logistics	Logistics	C	124/DP1051990
19	300521	6256497	Toll NQX Sydney	Logistics	C	1/DP1194933
20	299787	6257251	Collins Sydney	Logistics	C	271/DP1198561
21	299619	6258027	CEVA logistics	Logistics	C	20/DP1174987
22	300908	6257884	Several Warehouse and logistics	Logistics	C	11/DP1144025
23	300274	6257631	Several Warehouse and logistics	Logistics	C	11/DP1144025
24	300653	6257771	Several Warehouse and logistics	Logistics	C	11/DP1144025
25	300597	6257956	Several Warehouse and logistics	Logistics	C	11/DP1144025
26	300952	6256004	2 Shale Pl, Eastern Creek	Manufacturer	C	351/DP1094500
27	301091	6255875	CRL Australia Pty Ltd	Manufacturer	C	360/DP1094500
28	300644	6256611	Xylem Water Solutions Australia Ltd/Chemson Pacific Pty Ltd	Manufacturer	C	2/DP1194933
29	300737	6257030	Vitex Pharmaceuticals	Manufacturer	C	206/DP1074277
30	299223	6257313	LAPP Australia	Manufacturer	C	13/DP1183816
31	299696	6257683	Alfagomma Australia Pty Ltd	Manufacturer	C	25/DP1199170

Receptor ID	X	Y	Name	Type	Label	Lot
32	303125	6257700	PPG	Manufacturer	C	1/DP1168617
33	303263	6257681	Sentry Medical	Manufacturer	C	4/DP1168618
34	303354	6257670	Boori Australia	Manufacturer	C	5/DP1168618
35	302991	6258112	Arnott's	Manufacturer	C	1/DP866251
36	301308	6254795	2C Burley Rd	Residential	R	34/DP1062703
37	301290	6254661	1A Burley Rd	Residential	R	21/DP1128863
38	301309	6254773	2C Burley Rd	Residential	R	34/DP1062703
39	300427	6254018	82-90 Arundel Rd	Residential	R	1/DP520455
40	300352	6253890	85 Arundel Rd	Residential	R	264/DP17288
41	300341	6253807	71-77 Arundel Rd	Residential	R	265/DP17288
42	301207	6253629	40 Walworth Road	Residential	R	3/DP1154612
43	300788	6254702	182 Walworth Road	Residential	R	249A/DP17288
44	301131	6254100	104 Walworth Road	Residential	R	B/DP345639
45	300735	6254828	66-80 Burley Rd	Residential	R	243/DP13905
46	300780	6254804	58-64 Burley Rd	Residential	R	1/DP523725
47	300909	6254790	48 Burley Rd	Residential	R	A/DP393990
48	301008	6254770	34 Burley Rd	Residential	R	B/DP393990
49	300984	6254702	23 Burley Rd	Residential	R	2482/DP1233287
50	299954	6254313	212-222 Delaware Rd	Residential	R	232D/DP17288
51	299659	6253512	34 Delaware Rd	Residential	R	216A/DP17288
52	300087	6253510	43 Arundel Rd	Residential	R	2/DP600598
53	302197	6253875	143-155 Redmayne Rd	Residential	R	59B/DP362022
54	302438	6253670	152-170 Redmayne Rd	Residential	R	B/DP377249
55	302366	6253686	144-150 Redmayne Rd	Residential	R	A/DP357890
56	302513	6253669	172-180 Redmayne Rd	Residential	R	A/DP377249
57	302648	6253697	200-206 Redmayne Rd	Residential	R	74A/DP17288
58	300319	6254675	134 Burley Rd	Residential	R	2400/DP1090132
59	299810	6254736	198 Burley Rd	Residential	R	237/DP13905
60	299935	6254708	172 Burley Rd	Residential	R	B/DP104673
61	299142	6253879	181 Delaware Rd	Residential	R	3/DP627451
62	299198	6254654	285 Burley Rd	Residential	R	4/DP225031

Receptor ID	X	Y	Name	Type	Label	Lot
63	301400	6254264	319-327 Chandos Rd	Residential	R	117A/DP368009
64	302864	6254174	121-135 Chandos Rd	Residential	R	54/DP13961
65	300467	6257561	Myer Eastern Creek Distribution Centre	Warehouse	C	123/DP1203571
66	300556	6257339	Myer Eastern Creek Distribution Centre	Warehouse	C	123/DP1203571
67	300572	6257283	Hungry Baker	Restaurant	C	123/DP1203571
68	301070	6253180	Our Lady of Victories Horsley Park	Place of worship	P	1/DP816196
69	301183	6253326	Marion Catholic Primary School	School	R	1/DP816196
70	302030	6253878	137-141 Redmayne Rd	Residential	R	B/DP357087
71	299356	6256585	FUJITSU GENERAL (AUST.) PTY LIMITED	Office	C	521/DP1238718
72	300961	6255852	Caruso's Natural Health	Office	C	354/DP1094500
73	300797	6256255	Garmin Australasia	Office	C	344/DP1094500
74	299892	6257413	Cassons	Office	C	7/DP1153686
75	299731	6257798	CH2	Office	C	23/DP1180307
76	300798	6256254	Garmin Australasia	Office	C	344/DP1094500
77	301004	6257396	LG Electronics	Office	C	200/DP1068492
78	303478	6257916	Alfa Laval Australia	Office	C	2/DP857249
79	303338	6258079	Endeavour Energy	Office	C	1/DP857249
80	302904	6257281	Sydney Motorsport Park	Park	P	3/DP1079897
81	302294	6253117	1642 The Horsley Drive, Horsley Park	Petrol Station	C	89B/DP17288
82	300989	6256674	BP	Petrol Station	C	1/DP1198798
83	300310	6254161	Horsley Park Christian Church	Place of worship	P	259/DP17288
84	301298	6254045	Panditarama Sydney Meditation Centre	Place of worship	P	116A/DP349068
85	301543	6253801	Spanish Community Bible Church	Place of worship	P	1/DP541719
86	303015	6256648	Sydney Dragway	Racing track	P	1/DP69882
87	301284	6254721	2A Burley Rd	Residential	R	32/DP1062703
88	300475	6254496	148 Arundel Rd	Residential	R	11/DP577911
89	300389	6254542	151 Arundel Rd	Residential	R	321/DP865964
90	300274	6254395	149 Arundel Rd	Residential	R	31/DP597928
91	300465	6254425	136-146 Arundel Rd	Residential	R	12/DP577911
92	300258	6254349	135 Arundel Rd	Residential	R	42/DP854173
93	300331	6254291	129 Arundel Rd	Residential	R	41/DP854173

Receptor ID	X	Y	Name	Type	Label	Lot
94	300338	6254256	117 Arundel Rd	Residential	R	1/DP534113
95	300431	6254138	112 Arundel Rd	Residential	R	1/DP776557
96	300423	6254188	114-116 Arundel Rd	Residential	R	11/DP1007229
97	300634	6254193	122 Arundel Rd	Residential	R	12/DP1007229
98	300640	6254262	126 Arundel Rd	Residential	R	22/DP1093103
99	300564	6254276	136-146 Arundel Rd	Residential	R	21/DP1093103
100	300373	6254091	105 Arundel Rd	Residential	R	260/DP17288
101	300365	6254022	99 Arundel Rd	Residential	R	261/DP17288
102	300419	6254056	98 Arundel Rd	Residential	R	3/DP776557
103	300411	6253901	74-76 Arundel Rd	Residential	R	2/DP520455
104	300415	6253877	72 Arundel Rd	Residential	R	1/DP1017215
105	300412	6253828	66-68 Arundel Rd	Residential	R	2/DP1017215
106	300455	6253772	64 Arundel Rd	Residential	R	2/DP1023538
107	300411	6253682	40 Arundel Rd	Residential	R	1/DP1023538
108	300328	6253742	69 Arundel Rd	Residential	R	266A/DP346254
109	300306	6253682	55 Arundel Rd	Residential	R	266B/DP346254
110	300380	6253558	31 Arundel Rd	Residential	R	1/DP1164659
111	300326	6253499	33 Arundel Rd	Residential	R	2/DP1164659
112	300450	6253614	30 Arundel Rd	Residential	R	E/DP388234
113	300483	6253574	26 Arundel Rd	Residential	R	1/DP1111601
114	300498	6253542	20 Arundel Rd	Residential	R	2/DP1111601
115	300402	6253478	17 Arundel Rd	Residential	R	2/DP1161205
116	300825	6253423	1801 The Horsley Dr	Residential	R	1/DP1012568
117	300849	6253417		Residential	R	135B/DP419274
118	300804	6253596	1799 The Horsley Dr	Residential	R	2/DP1012568
119	300952	6253398	1791 The Horsley Dr	Residential	R	2/DP619581
120	301109	6253667	35-43 Walworth Road	Residential	R	132/DP13905
121	301093	6253793	52 Walworth Road	Residential	R	1/DP881065
122	301131	6253757	52 Walworth Road	Residential	R	1/DP881065
123	301149	6253709	52 Walworth Road	Residential	R	1/DP1154612
124	301285	6253738	54 Walworth Road	Residential	R	2/DP881065

Receptor ID	X	Y	Name	Type	Label	Lot
125	301058	6253759	63 Walworth Road	Residential	R	131A/DP401832
126	301047	6253860	65-73 Walworth Road	Residential	R	4/DP579458
127	301110	6253859	64 Walworth Road	Residential	R	C/DP348656
128	301123	6253933	78 Walworth Road	Residential	R	B/DP348656
129	301131	6253958	88 Walworth Road	Residential	R	A/DP348656
130	301274	6253989	88 Walworth Road	Residential	R	A/DP348656
131	301084	6253991	87 Walworth Road	Residential	R	129A/DP349480
132	301100	6254041	87 Walworth Road	Residential	R	129A/DP349480
133	301362	6253905	10-20 Walworth Road	Residential	R	105B/DP327970
134	301457	6254206	727 Walworth Road	Residential	R	117B/DP368009
135	301535	6254536	741 Walworth Road	Residential	R	112/DP1067650
136	301418	6254458	310 Chandos Rd	Residential	R	12/DP1033429
137	301538	6254639	749-761 Walworth Road	Residential	R	22/DP1128863
138	300718	6254717	231 Walworth Road	Residential	R	20/DP1016912
139	300734	6254658	211-221 Walworth Road	Residential	R	21/DP1016912
140	300767	6254552	189-209 Walworth Road	Residential	R	3/DP706864
141	300813	6254478	163 Walworth Road	Residential	R	51/DP1095736
142	300933	6254452	166 Walworth Road	Residential	R	51/DP1071120
143	300836	6254401	157 Walworth Road	Residential	R	52/DP1095736
144	300747	6254335	151 Walworth Road	Residential	R	53/DP1095736
145	301026	6254294	134 Walworth Road	Residential	R	1253/DP870457
146	300682	6254445	187 Walworth Road	Residential	R	4/DP706864
147	300985	6254202	123 Walworth Road	Residential	R	3/DP547963
148	301029	6254241	112-124 Walworth Road	Residential	R	A/DP345639
149	301159	6254068	1 Redmayne Rd	Residential	R	1/DP366621
150	300755	6254064	104 Arundel Rd	Residential	R	2/DP776557
151	300593	6254646	23 Burley Rd	Residential	R	1/DP706864
152	301055	6254764	32 Burley Rd	Residential	R	246/DP13905
153	301118	6254614	13-17 Burley Rd	Residential	R	1/DP1063378
154	301085	6254559	19-21 Burley Rd	Residential	R	2/DP1063378
155	301430	6254741	2B Burley Rd	Residential	R	33/DP1062703

Receptor ID	X	Y	Name	Type	Label	Lot
156	299850	6254605	411 Delaware Rd	Residential	R	24/DP867511
157	299839	6254567	401 Delaware Rd	Residential	R	23/DP867511
158	299913	6254581	258 Delaware Rd	Residential	R	232A/DP17288
159	299978	6253774	134 Delaware Rd	Residential	R	12/DP867049
160	299682	6253677	114-118 Delaware Rd	Residential	R	71/DP568924
161	299671	6253638	108-112 Delaware Rd	Residential	R	72/DP568924
162	299710	6253587	104 Delaware Rd	Residential	R	10/DP880088
163	299659	6253544	100 Delaware Rd	Residential	R	2/DP605025
164	299915	6253542	102 Delaware Rd	Residential	R	11/DP880088
165	299831	6253346	68 Delaware Rd	Residential	R	2151/DP1120549
166	300158	6253612	53 Arundel Rd	Residential	R	11/DP1170257
167	300070	6253617	54 Arundel Rd	Residential	R	10/DP1170257
168	300327	6253405	19-27 Arundel Rd	Residential	R	1/DP1161205
169	301225	6254076	13 Redmayne Rd	Residential	R	1/DP668960
170	301281	6254056	13 Redmayne Rd	Residential	R	1/DP668960
171	302206	6253687	134 Redmayne Rd	Residential	R	77/DP13961
172	302288	6253833	157-165 Redmayne Rd	Residential	R	59A/DP362022
173	302420	6253916	167-183 Redmayne Rd	Residential	R	1/DP505934
174	302443	6253875	185-193 Redmayne Rd	Residential	R	2/DP505934
175	302466	6253854	185-193 Redmayne Rd	Residential	R	2/DP505934
176	302486	6253747	195-201 Redmayne Rd	Residential	R	61B/DP17288
177	302511	6253734	195-201 Redmayne Rd	Residential	R	61B/DP17288
178	302584	6253674	182 Redmayne Rd	Residential	R	74B/DP17288
179	302180	6253222	1671 The Horsley Dr	Residential	R	78B/DP347873
180	302244	6253194	1667 The Horsley Dr	Residential	R	79A/DP17288
181	302285	6253187	1657 The Horsley Dr	Residential	R	79B/DP17288
182	300945	6254523	168 Walworth Rd	Residential	R	1/DP876153
183	300327	6254796	138 Burley Rd	Residential	R	2401/DP1090132
184	300338	6254872	142 Burley Rd	Residential	R	2402/DP1090132
185	300346	6254949	144 Burley Rd	Residential	R	2403/DP1090132
186	300356	6255003	146 Burley Rd	Residential	R	2404/DP1090132

Receptor ID	X	Y	Name	Type	Label	Lot
187	300053	6254416	143 Delaware Rd	Residential	R	4/DP1174904
188	300084	6254250	143 Delaware Rd	Residential	R	5/DP1174904
189	300145	6254557	143 Delaware Rd	Residential	R	2/DP1174904
190	300237	6254559	131 Burley Rd	Residential	R	320/DP865964
191	299122	6254699	321 Burley Rd	Residential	R	70/DP883089
192	299119	6254547	315 Burley Rd	Residential	R	71/DP883089
193	299039	6254107	253-255 Delaware Rd	Residential	R	141/DP880131
194	299185	6254083	257 Delaware Rd	Residential	R	142/DP880131
195	299262	6254060	265 Delaware Rd	Residential	R	150/DP882466
196	299420	6254036	271 Delaware Rd	Residential	R	151/DP882466
197	299163	6253984	243 Delaware Rd	Residential	R	132/DP1066469
198	299244	6253972	235 Delaware Rd	Residential	R	121/DP868608
199	299371	6253935		Residential	R	122/DP868608
200	299392	6253848	193 Delaware Rd	Residential	R	2/DP627451
201	299178	6254491	287-299 Burley Rd	Residential	R	5/DP225031
202	299399	6254650	259 Burley Rd	Residential	R	21/DP1050695
203	299440	6254661	251-255 Burley Rd	Residential	R	22/DP1050695
204	302285	6254196	211 Chandos Rd	Residential	R	58B/DP17288
205	302474	6254229	187-201 Chandos Rd	Residential	R	57/DP13961
206	302576	6254217	171-185 Chandos Rd	Residential	R	56/DP13961
207	302884	6254232	126 Chandos Rd	Residential	R	7/DP30290
208	302692	6254259	150-154 Chandos Rd	Residential	R	3/DP30290
209	302579	6254293	Chandos Rd	Residential	R	93/DP752041
210	301669	6258683	41 Pikes Ln	Residential	R	1/DP723214
211	299584	6253854	213 Delaware Rd	Residential	R	101/DP851315
212	299624	6253781	205-209 Delaware Rd	Residential	R	102/DP851315
213	299655	6254030	281 Delaware Rd	Residential	R	1/DP879934
214	299637	6253983	279 Delaware Rd	Residential	R	2/DP879934
215	299701	6254271	371 Delaware Rd	Residential	R	231B/DP17288
216	299678	6254208	321 Delaware Rd	Residential	R	A/DP393203
217	299663	6254112	289 Delaware Rd	Residential	R	B/DP393203

Receptor ID	X	Y	Name	Type	Label	Lot
218	299742	6254215		Residential	R	251/DP17288
219	299733	6254098	180 Delaware Rd	Residential	R	C/DP408710
220	299714	6253984	229-266 Delaware Rd	Residential	R	A/DP350184
221	301151	6253070	51-61 Felton St	Residential	R	112/DP884486
222	301118	6253062	71 Felton St	Residential	R	151/DP13905
223	301064	6253100	73 Felton St	Residential	R	150/DP13905
224	301195	6253089	51 Felton St	Residential	R	153/DP13905
225	301023	6253199	58 Felton St	Residential	R	170/DP13905
226	300999	6253251	68 Felton St	Residential	R	171/DP13905
227	300910	6253292	1816 The Horsley Dr	Residential	R	145/DP13905
228	300886	6253330	1816B The Horsley Dr	Residential	R	144/DP13905
229	301012	6253430	1789 The Horsley Dr	Residential	R	189/DP13905
230	301069	6253320	1806 The Horsley Dr	Residential	R	173/DP13905
231	301274	6253233	14-16 Felton St	Residential	R	163/DP13905
232	301259	6253205	18-20 Felton St	Residential	R	1/DP632483
233	301272	6253144	32 Felton St	Residential	R	165/DP13905
234	301272	6253174	22-24 Felton St	Residential	R	2/DP632483
235	301336	6253188	19 Felton St	Residential	R	2/DP126778
236	301390	6253137	553 Wallgrove Rd	Residential	R	A/DP377502
237	301082	6253414	1785 The Horsley Dr	Residential	R	187/DP13905
238	301179	6253442	1779 The Horsley Dr	Residential	R	185/DP13905
239	301118	6253425	1783 The Horsley Dr	Residential	R	186/DP13905
240	301254	6252994	41 Felton St	Residential	R	154/DP13905
241	299089	6253987	247 Delaware Rd	Residential	R	131/DP1066469
242	301205	6253188	34-38 Felton St	Residential	R	166/DP13905
243	301303	6253268	1770 The Horsley Dr	Residential	R	179/DP13905
244	301531	6254781	783 Walworth Road	Residential	R	31/DP1062703
245	300478	6254691	106 Burley Rd	Residential	R	1/DP1021715
246	299717	6253864	150 Delaware Rd	Residential	R	B/DP350184
247	299688	6253813	132 Delaware Rd	Residential	R	11/DP867049
248	299684	6253779	120-128 Delaware Rd	Residential	R	2/DP507105

Receptor ID	X	Y	Name	Type	Label	Lot
249	299722	6254015	166 Delaware Rd	Residential	R	A/DP408710
250	300726	6253110	24-28 Horsley Rd	Residential	R	30/DP1159000
251	300972	6253162	93 Felton St	Residential	R	148/DP13905
252	301041	6253325	1808 The Horsley Dr	Residential	R	172/DP13905
253	300944	6253265	113 Felton Street	Residential	R	146/DP13905
254	301292	6253065	37 Felton St	Residential	R	12/DP621469
255	301404	6253069	551 Wallgrove Rd	Residential	R	B/DP377502
256	303376	6253942		Residential	R	38A/DP13961
257	303238	6254027	117 Ferrers Rd	Residential	R	50C/DP348693
258	302490	6253284	1627 The Horsley Dr	Residential	R	81A/DP348110
259	302530	6253276	1627 The Horsley Dr	Residential	R	81A/DP348110
260	302397	6253088	1624 The Horsley Dr	Residential	R	88/DP13961
261	300125	6253368	1906 The Horsley Dr	Residential	R	61/DP1081261
262	300117	6253237	Jamieson Cl	Residential	R	60/DP1081261
263	300232	6253225	59 Jamieson Cl	Residential	R	7/DP240509
264	300259	6253114	60 Jamieson Cl	Residential	R	8/DP240509
265	300307	6253112	65-69 Jamieson Cl	Residential	R	9/DP240509
266	300401	6253285	65-69 Jamieson Cl	Residential	R	9/DP240509
267	301297	6253950		Residential	R	105A/DP327970
268	300363	6256430	2 Southridge St	Warehouse & Store	C	3/DP270876
269	300362	6256429	2 Southridge St	Warehouse & Store	C	3/DP270876
270	300699	6255633	Spec Unit - M7 Business Hub	Warehouse	C	101/DP1168236
271	301273	6253429	Horsley Park Public School	School	R	2/DP818186
272	300751	6253325	Horsley Park Gun Shop	Store	C	2/DP242872
273	299776	6256674	Dart Shop Sydney	Store	C	1/DP1243688
274	300298	6257356	Nover & Co Pty Ltd	Supplier	C	125/DP1051990
275	300936	6257401	2 Beach St, Eastern Creek	Supplier	C	201/DP1068492
276	300716	6257280	Macsim	Supplier	C	208/DP1074277
277	301077	6255796	Century Yuasa Batteries	Supplier	C	358/DP1094500
278	300953	6257004	ALSPEC Sydney	Supplier	C	12/DP1197531
279	300988	6257113	Ontex Industries International	Supplier	C	13/DP1197531

Receptor ID	X	Y	Name	Type	Label	Lot
280	301055	6257223	Brighton-Best International	Supplier	C	217/DP1076826
281	300799	6257265	Dynamic Supplies Pty Ltd The Moving Box Company	Supplier	C	2181/DP1222760
282	300833	6257222	Dynamic Supplies Pty Ltd The Moving Box Company	Supplier	C	2181/DP1222760
283	299339	6257754	Aggreko	Supplier	C	19/DP1171048
284	299328	6257628	Layher	Supplier	C	18/DP1183885
285	299270	6257549	AJ Baker & Sons Pty Ltd	Supplier	C	17/DP1187697
286	299294	6257481	Alemlube	Supplier	C	15/DP1183911
287	303408	6257684	Extal Aluminium	Supplier	C	4/DP1122038
288	303462	6257633	36 Peter Brock Dr	Supplier	C	67/DP1175863
289	303407	6257652	Electra-Loom PTY Ltd.	Supplier	C	5/DP1122038
290	303521	6257631	House of Stone	Supplier	C	8/DP1122038
291	303563	6257629	Hardmetals	Supplier	C	9/DP1122038
292	303597	6257632	Hardmetals	Supplier	C	10/DP1122038
293	303642	6257628	Eastern Creek Automotive	Supplier	C	/SP86135
294	300809	6257599	Manassen Foods	Supplier	C	22/DP1142490
295	302078	6256577		Industrial	C	21/DP1205425
296	301686	6255572	Austral Bricks Horsley Park	Manufacturer	C	7/DP1059698
297	301686	6255572	Brickworks Building Products	Manufacturer	C	7/DP1059698
298	301688	6255537	Austral Masonry Horsley Park	Park	P	7/DP1059698
299	302107	6255431	Austral Bricks Plant 1	Manufacturer	C	7/DP1059698
300	300942	6255799	TLD	Warehouse	C	355/DP1094500
301	300974	6256176	Kärcher Eastern Creek	Warehouse	C	347/DP1094500
302	300911	6256287	PremiAir Hire	Warehouse	C	343/DP1094500
303	300688	6255876	CCA	Warehouse	C	251/DP1082988
304	299552	6256109	Coles NDC	Warehouse	C	553/DP1110447
305	299421	6258033	DB Schenker	Warehouse	C	1/DP1214843
306	299494	6257405	Kmart DC	Warehouse	C	8/DP1155742
307	299003	6257580	Rhino-Rack	Warehouse	C	62/DP1234758
308	298584	6255017		Warehouse	C	3/DP1237058
309	301053	6257629	Asics	Warehouse	C	21/DP1142490
310	300453	6257294		Warehouse	C	2201/DP1097247

Receptor ID	X	Y	Name	Type	Label	Lot
311	301100	6258590	Calibre by Mirvac	Warehouse	C	100/DP1240519
312	302550	6258588		Warehouse	C	332/DP1193405
313	300885	6256116	Trendtile	Warehouse & Store	C	349/DP1094500
314	300900	6256162	Marbletrend Bathroom Industries	Warehouse & Store	C	346/DP1094500
315	300277	6256223	Rust-Oleum (And other suppliers)	Warehouse & Store	C	13/DP1195577
316	299519	6257840	Best and Less DC…	Warehouse & Store	C	3/DP1149138
317	300217	6256491	Rust-Oleum (And other suppliers)	Warehouse & Store	C	13/DP1195577
318	300672	6257474	Superior Active Wear	Warehouse & Store	C	23/DP1142490
319	301519	6255882	Global Renewables	Waste treatment facility	C	10/DP1048435
320	301497	6256296	SUEZ Eastern Creek Resource Recovery Park	Waste treatment facility	C	2/DP1073820

Appendix E

NO_x Analysis

NO_x analysis

The NSW EPA's Janssen method "Level 2 assessment - Contemporaneous impact and background" approach was applied to estimate the NO_X to NO_2 conversion ratio at all locations in the domain to assess potential impacts in accordance with the NSW EPA Approved Methods; refer to the worked example on Page 40 of the Approved Method (NSW DEC, 2005).

This method consists of calculating the ratio of NO_2 to NO_X as determined by the atmospheric conditions and distance from the maximum recorded level to the source, per the following equation:

$$NO_2 / NO_x = A(1 - \exp(-\alpha x))$$

where:

x = the distance from the source

A and α are classified according to O_3 concentration, wind speed and season (Janssen et al. (1988) provides values for A and α).

In simple terms, the contemporaneous assessment involves applying an estimated the NO_x to NO_2 ratio to the maximum predicted 1-hour average NO_2 ground level concentration for each hour and adding 1-hour average background concentrations representing the same period.

The maximum total NO_2 concentration was determined by applying a ratio of NO_2 to NO_x to the predicted maximum one-hour average NO_x concentrations and adding the result to the maximum one-hour average background NO_2 concentrations.

The potential effects of the Next Generation Energy from Waste Facility with ambient (background) NO_2 concentration data corresponding with the year of modelling (2015) from the NSW OEH monitoring site at Prospect have been applied in this case to represent the prevailing background levels in the vicinity of the proposal and at representative receptor locations surrounding the proposal.

Table E-1 below provides an excerpt from the first ten hours as a worked example to illustrate.

Table E-1: NO_x to NO_2 analysis example

Date	NG NO_x (100%)	x (km) from stack	A	α	NO_2/NO_x ratio	NG NO_2	Max proposal NO_x	x (km) from stack	A	α	NO_2/NO_x ratio	proposal NO_2	BG NO_2	BG + proposal NO_2	BG + proposal + NG NO_2
1/01/2015 0:00	0.00	4.02	0.67	0.1	22.17%	0.00	0.44	1.21	0.67	0.1	7.61%	0.03	10.25	10.28	10.28
1/01/2015 1:00	0.00	0.83	0.67	0.1	5.32%	0.00	0.12	3.96	0.67	0.1	21.91%	0.03	22.6	0.03	0.03
1/01/2015 2:00	0.00	0.83	0.67	0.1	5.32%	0.00	0.01	0.73	0.67	0.1	4.71%	0	22.55	22.55	22.55
1/01/2015 3:00	0.00	0.45	0.67	0.1	2.94%	0.00	0.02	3.39	0.67	0.1	19.24%	0	20.5	20.5	20.5
1/01/2015 4:00	0.00	0.45	0.67	0.1	2.94%	0.00	0.07	3.08	0.67	0.1	17.77%	0.01	20.5	20.51	20.51
1/01/2015 5:00	0.00	4.22	0.67	0.1	23.07%	0.00	1.37	5.56	0.67	0.1	28.57%	0.39	20.5	20.89	20.89
1/01/2015 6:00	5.03	1.17	0.67	0.1	7.40%	0.37	50.71	0.87	0.67	0.1	5.56%	2.82	14.35	17.17	17.54
1/01/2015 7:00	5.75	3.24	0.67	0.1	18.53%	1.07	33.22	1.12	0.67	0.1	7.10%	2.36	4.1	6.46	7.52
1/01/2015 8:00	5.62	1.49	0.67	0.1	9.27%	0.52	59.23	0.22	0.67	0.1	1.44%	0.85	4.1	4.95	5.47
1/01/2015 9:00	6.57	0.99	0.67	0.1	6.99%	0.46	93.32	0.32	0.67	0.1	2.09%	1.95	2.05	4.00	4.46

Appendix F

Further detail regarding 24-hour $PM_{2.5}$ and PM_{10} analysis

Further detail regarding 24-hour average $PM_{2.5}$ and PM_{10} analysis

The analysis below provides a cumulative 24-hour $PM_{2.5}$ and a 24-hour PM_{10} impact assessment in accordance with the NSW EPA Approved Methods; refer to the worked example on Page 46 to 47 of the Approved Methods.

The background level is the ambient level at from the Next Generation Energy from Waste Facility combined with the Prospect monitoring station for $PM_{2.5}$ and PM_{10}.

The predicted increment is the predicted level to occur at the receptor due to the proposal.

The total is the sum of the background level and the predicted level. The totals may have minor discrepancies due to rounding.

Tables F-1 to **F-24** assesses one receptor and shows the predicted maximum cumulative levels at selective representative receptors near the proposal for scenario 2, LP1, without and with contributions from the Next Generation Energy from Waste Facility.

Tables F-25 to **F-48** assesses one receptor and shows the predicted maximum cumulative levels at selective representative receptors near the proposal for scenario 2, Max LP, without and with contributions from the Next Generation Energy from Waste Facility.

Tables F-49 to **F72** assesses one receptor and shows the predicted maximum cumulative levels at selective representative receptors near the proposal for scenario 4, Max LP 24-hour, without and with contributions from the Next Generation Energy from Waste Facility.

The left half of the table examines the cumulative impact during the periods of highest background levels and the right half of the table examines the cumulative impact during the periods of highest contribution from the proposal.

The green shading represents days ranked per the highest background level but below the criteria.

The blue shading represents days ranked per the highest predicted increment level but below the criteria.

The orange shading represents days where the measured background level is already over the criteria.

Any value above the $PM_{2.5}$ criterion of 25µg/m^3 or above the PM_{10} criterion of 50µg/m^3 is in **bold red.**

Scenario 2, LP1

Table F-1: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R1, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.00	29.60				
5/07/2015	24.90	0.00	24.90	21/11/2015	7.00	0.37	7.37
4/07/2015	21.50	0.00	21.50	5/02/2015	6.70	0.27	6.97
7/06/2015	21.20	0.00	21.20	13/02/2015	6.40	0.26	6.66
21/08/2015	20.50	0.00	20.50	17/10/2015	12.10	0.24	12.34
25/05/2015	20.10	0.00	20.10	4/04/2015	3.20	0.23	3.43
14/06/2015	19.30	0.01	19.31	18/10/2015	8.40	0.22	8.62
9/07/2015	18.40	0.00	18.40	9/02/2015	11.90	0.22	12.12
27/06/2015	17.10	0.00	17.10	11/01/2015	2.80	0.21	3.01
7/10/2015	17.10	0.00	17.10	21/12/2015	12.40	0.20	12.60
6/06/2015	16.90	0.00	16.90	5/09/2015	8.50	0.19	8.69

Table F-2: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R27, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.01	29.61				
5/07/2015	24.90	0.00	24.90	17/10/2015	12.10	0.39	12.49
4/07/2015	21.50	0.00	21.50	15/12/2015	12.70	0.19	12.89
7/06/2015	21.20	0.00	21.20	21/12/2015	12.40	0.17	12.57
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	0.15	10.15
25/05/2015	20.10	0.00	20.10	21/02/2015	4.10	0.15	4.25
14/06/2015	19.30	0.03	19.33	6/01/2015	7.10	0.14	7.24
9/07/2015	18.40	0.01	18.41	5/01/2015	9.30	0.14	9.44
27/06/2015	17.10	0.00	17.10	4/02/2015	7.70	0.13	7.83
7/10/2015	17.10	0.00	17.10	29/12/2015	3.60	0.13	3.73
6/06/2015	16.90	0.00	16.90	10/10/2015	10.60	0.12	10.72

Table F-3: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R37, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.03	29.63				
5/07/2015	24.90	0.00	24.90	23/05/2015	9.40	0.25	9.65
4/07/2015	21.50	0.02	21.52	22/05/2015	5.00	0.21	5.21
7/06/2015	21.20	0.00	21.20	29/01/2015	3.10	0.19	3.29
21/08/2015	20.50	0.00	20.50	16/05/2015	6.10	0.17	6.27
25/05/2015	20.10	0.01	20.11	19/07/2015	7.30	0.16	7.46
14/06/2015	19.30	0.03	19.33	20/07/2015	8.80	0.16	8.96
9/07/2015	18.40	0.04	18.44	27/02/2015	4.40	0.16	4.56
27/06/2015	17.10	0.00	17.10	20/06/2015	6.70	0.16	6.86
7/10/2015	17.10	0.00	17.10	22/04/2015	1.50	0.15	1.65
6/06/2015	16.90	0.01	16.91	29/04/2015	3.70	0.15	3.85

Table F-4: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R46, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.04	29.64				
5/07/2015	24.90	0.01	24.91	21/08/2015	20.50	0.13	20.63
4/07/2015	21.50	0.00	21.50	23/03/2015	5.80	0.12	5.92
7/06/2015	21.20	0.07	21.27	26/12/2015	6.50	0.11	6.61
21/08/2015	20.50	0.13	20.63	20/12/2015	12.70	0.11	12.81
25/05/2015	20.10	0.01	20.11	16/02/2015	7.30	0.11	7.41
14/06/2015	19.30	0.02	19.32	25/11/2015	10.50	0.10	10.60
9/07/2015	18.40	0.10	18.50	9/07/2015	18.40	0.10	18.50
27/06/2015	17.10	0.00	17.10	30/10/2015	6.30	0.09	6.39
7/10/2015	17.10	0.00	17.10	17/11/2015	5.00	0.09	5.09
6/06/2015	16.90	0.00	16.90	31/10/2015	5.90	0.09	5.99

Table F-5: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R277, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.01	29.61				
5/07/2015	24.90	0.00	24.90	17/10/2015	12.10	0.47	12.57
4/07/2015	21.50	0.00	21.50	15/12/2015	12.70	0.20	12.90
7/06/2015	21.20	0.00	21.20	6/01/2015	7.10	0.20	7.30
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	0.16	10.16
25/05/2015	20.10	0.00	20.10	6/12/2015	5.00	0.16	5.16
14/06/2015	19.30	0.03	19.33	10/10/2015	10.60	0.15	10.75
9/07/2015	18.40	0.01	18.41	5/01/2015	9.30	0.14	9.44
27/06/2015	17.10	0.00	17.10	30/12/2015	4.80	0.14	4.94
7/10/2015	17.10	0.00	17.10	4/01/2015	9.20	0.12	9.32
6/06/2015	16.90	0.00	16.90	12/03/2015	13.70	0.11	13.81

Table F-6: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R319 , without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.02	29.62				
5/07/2015	24.90	0.01	24.91	19/11/2015	10.80	0.26	11.06
4/07/2015	21.50	0.01	21.51	5/01/2015	9.30	0.20	9.50
7/06/2015	21.20	0.00	21.20	15/02/2015	7.10	0.20	7.30
21/08/2015	20.50	0.00	20.50	15/06/2015	12.60	0.19	12.79
25/05/2015	20.10	0.02	20.12	7/02/2015	9.30	0.18	9.48
14/06/2015	19.30	0.05	19.35	12/09/2015	8.80	0.16	8.96
9/07/2015	18.40	0.05	18.45	18/01/2015	11.00	0.16	11.16
27/06/2015	17.10	0.03	17.13	25/01/2015	7.20	0.16	7.36
7/10/2015	17.10	0.00	17.10	17/10/2015	12.10	0.15	12.25
6/06/2015	16.90	0.02	16.92	8/02/2015	9.00	0.15	9.15

Table F-7: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R1, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.08	48.08	21/11/2015	25.30	0.38	25.68
26/11/2015	45.10	0.00	45.10	5/02/2015	16.00	0.28	16.28
7/10/2015	38.50	0.00	38.50	13/02/2015	13.00	0.27	13.27
17/10/2015	35.30	0.25	35.55	17/10/2015	35.30	0.25	35.55
14/12/2015	34.70	0.09	34.79	4/04/2015	8.50	0.24	8.74
12/12/2015	34.30	0.11	34.41	18/10/2015	26.70	0.23	26.93
15/12/2015	33.40	0.11	33.51	9/02/2015	31.50	0.22	31.72
20/11/2015	32.90	0.04	32.94	11/01/2015	6.00	0.21	6.21
23/11/2015	31.70	0.09	31.79	21/12/2015	27.90	0.21	28.11
9/02/2015	31.50	0.22	31.72	5/09/2015	15.50	0.20	15.70

Table F-8: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R27, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.11	48.11	17/10/2015	35.30	0.40	35.70
26/11/2015	45.10	0.01	45.11	15/12/2015	33.40	0.19	33.59
7/10/2015	38.50	0.00	38.50	21/12/2015	27.90	0.18	28.08
17/10/2015	35.30	0.40	35.70	2/01/2015	26.70	0.16	26.86
14/12/2015	34.70	0.06	34.76	21/02/2015	9.00	0.15	9.15
12/12/2015	34.30	0.07	34.37	6/01/2015	15.30	0.14	15.44
15/12/2015	33.40	0.19	33.59	5/01/2015	25.80	0.14	25.94
20/11/2015	32.90	0.02	32.92	4/02/2015	24.60	0.14	24.74
23/11/2015	31.70	0.12	31.82	29/12/2015	13.90	0.14	14.04
9/02/2015	31.50	0.04	31.54	10/10/2015	28.80	0.13	28.93

Table F-9: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R37, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.03	48.03	23/05/2015	15.60	0.26	15.86
26/11/2015	45.10	0.00	45.10	22/05/2015	8.60	0.22	8.82
7/10/2015	38.50	0.00	38.50	29/01/2015	15.20	0.20	15.40
17/10/2015	35.30	0.02	35.32	16/05/2015	14.70	0.18	14.88
14/12/2015	34.70	0.01	34.71	19/07/2015	13.20	0.17	13.37
12/12/2015	34.30	0.00	34.30	20/07/2015	18.50	0.16	18.66
15/12/2015	33.40	0.00	33.40	27/02/2015		0.16	0.16
20/11/2015	32.90	0.00	32.90	20/06/2015	12.20	0.16	12.36
23/11/2015	31.70	0.01	31.71	22/04/2015		0.15	0.15
9/02/2015	31.50	0.00	31.50	29/04/2015	13.00	0.15	13.15

Table F-10: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R46, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	21/08/2015	28.80	0.13	28.93
26/11/2015	45.10	0.03	45.13	23/03/2015	12.30	0.13	12.43
7/10/2015	38.50	0.00	38.50	26/12/2015	11.20	0.12	11.32
17/10/2015	35.30	0.02	35.32	20/12/2015	24.60	0.11	24.71
14/12/2015	34.70	0.00	34.70	16/02/2015	16.30	0.11	16.41
12/12/2015	34.30	0.01	34.31	25/11/2015	30.50	0.11	30.61
15/12/2015	33.40	0.06	33.46	9/07/2015	20.10	0.11	20.21
20/11/2015	32.90	0.00	32.90	30/10/2015	20.90	0.10	21.00
23/11/2015	31.70	0.00	31.70	17/11/2015	16.40	0.09	16.49
9/02/2015	31.50	0.00	31.50	31/10/2015	17.80	0.09	17.89

Table F-11: Cumulative 24-hour average PM_{10} concentration ($\mu g/m^3$) – Receptor R277, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.11	48.11	17/10/2015	35.30	0.49	35.79
26/11/2015	45.10	0.00	45.10	15/12/2015	33.40	0.21	33.61
7/10/2015	38.50	0.00	38.50	6/01/2015	15.30	0.20	15.50
17/10/2015	35.30	0.49	35.79	2/01/2015	26.70	0.16	26.86
14/12/2015	34.70	0.04	34.74	6/12/2015	15.30	0.16	15.46
12/12/2015	34.30	0.11	34.41	10/10/2015	28.80	0.16	28.96
15/12/2015	33.40	0.21	33.61	5/01/2015	25.80	0.14	25.94
20/11/2015	32.90	0.01	32.91	30/12/2015	14.40	0.14	14.54
23/11/2015	31.70	0.06	31.76	4/01/2015	14.20	0.13	14.33
9/02/2015	31.50	0.00	31.50	12/03/2015	25.00	0.12	25.12

Table F-12: Cumulative 24-hour average PM_{10} concentration ($\mu g/m^3$) – Receptor R319, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.01	68.71				
27/11/2015	48.00	0.00	48.00	19/11/2015	31.00	0.27	31.27
26/11/2015	45.10	0.00	45.10	5/01/2015	25.80	0.21	26.01
7/10/2015	38.50	0.00	38.50	15/02/2015	16.10	0.21	16.31
17/10/2015	35.30	0.16	35.46	15/06/2015	20.20	0.19	20.39
14/12/2015	34.70	0.13	34.83	7/02/2015	17.80	0.18	17.98
12/12/2015	34.30	0.00	34.30	12/09/2015	18.40	0.17	18.57
15/12/2015	33.40	0.01	33.41	18/01/2015	24.30	0.17	24.47
20/11/2015	32.90	0.01	32.91	25/01/2015	15.40	0.16	15.56
23/11/2015	31.70	0.05	31.75	17/10/2015	35.30	0.16	35.46
9/02/2015	31.50	0.00	31.50	8/02/2015	16.50	0.15	16.65

Table F-13: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R1, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.61	0.00	29.61				
5/07/2015	24.91	0.00	24.91	21/11/2015	7.00	0.37	7.37
4/07/2015	21.50	0.00	21.50	5/02/2015	6.70	0.27	6.97
7/06/2015	21.20	0.00	21.20	13/02/2015	6.40	0.26	6.66
21/08/2015	20.50	0.00	20.50	17/10/2015	12.10	0.24	12.34
25/05/2015	20.11	0.00	20.11	4/04/2015	3.20	0.23	3.43
14/06/2015	19.31	0.01	19.32	18/10/2015	8.40	0.22	8.62
9/07/2015	18.40	0.00	18.40	9/02/2015	11.90	0.22	12.12
27/06/2015	17.11	0.00	17.11	11/01/2015	2.80	0.21	3.01
7/10/2015	17.10	0.00	17.10	21/12/2015	12.40	0.20	12.60
6/06/2015	16.90	0.00	16.90	5/09/2015	8.50	0.19	8.69

Table F-14: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R27, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.01	29.61				
5/07/2015	24.91	0.00	24.91	17/10/2015	12.10	0.39	12.49
4/07/2015	21.50	0.00	21.50	15/12/2015	12.70	0.19	12.89
7/06/2015	21.20	0.00	21.20	21/12/2015	12.40	0.17	12.57
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	0.15	10.15
25/05/2015	20.11	0.00	20.11	21/02/2015	4.10	0.15	4.25
14/06/2015	19.30	0.03	19.33	6/01/2015	7.10	0.14	7.24
9/07/2015	18.40	0.01	18.41	5/01/2015	9.30	0.14	9.44
27/06/2015	17.11	0.00	17.11	4/02/2015	7.70	0.13	7.83
7/10/2015	17.10	0.00	17.10	29/12/2015	3.60	0.13	3.73
6/06/2015	16.90	0.00	16.90	10/10/2015	10.60	0.12	10.73

Table F-15: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R37, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.03	29.63				
5/07/2015	24.90	0.00	24.90	23/05/2015	9.40	0.25	9.65
4/07/2015	21.50	0.02	21.52	22/05/2015	5.00	0.21	5.21
7/06/2015	21.20	0.00	21.20	29/01/2015	3.10	0.19	3.29
21/08/2015	20.50	0.00	20.50	16/05/2015	6.10	0.17	6.27
25/05/2015	20.10	0.01	20.12	19/07/2015	7.30	0.16	7.46
14/06/2015	19.30	0.03	19.33	20/07/2015	8.80	0.16	8.96
9/07/2015	18.40	0.04	18.44	27/02/2015	4.40	0.16	4.56
27/06/2015	17.10	0.00	17.10	20/06/2015	6.70	0.16	6.86
7/10/2015	17.10	0.00	17.10	22/04/2015	1.50	0.15	1.65
6/06/2015	16.90	0.01	16.91	29/04/2015	3.70	0.15	3.85

Table F-16: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R46, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.04	29.64				
5/07/2015	24.91	0.01	24.92	21/08/2015	20.50	0.13	20.63
4/07/2015	21.50	0.00	21.50	23/03/2015	5.80	0.12	5.92
7/06/2015	21.20	0.07	21.28	26/12/2015	6.50	0.11	6.62
21/08/2015	20.50	0.13	20.63	20/12/2015	12.70	0.11	12.81
25/05/2015	20.10	0.01	20.12	16/02/2015	7.30	0.11	7.41
14/06/2015	19.30	0.02	19.32	25/11/2015	10.50	0.10	10.60
9/07/2015	18.40	0.10	18.50	9/07/2015	18.40	0.10	18.50
27/06/2015	17.10	0.00	17.10	30/10/2015	6.30	0.09	6.39
7/10/2015	17.10	0.00	17.10	17/11/2015	5.00	0.09	5.09
6/06/2015	16.90	0.00	16.90	31/10/2015	5.90	0.09	5.99

Table F-17: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R277, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.01	29.61				
5/07/2015	24.91	0.00	24.91	17/10/2015	12.10	0.47	12.57
4/07/2015	21.50	0.00	21.50	15/12/2015	12.70	0.20	12.90
7/06/2015	21.20	0.00	21.20	6/01/2015	7.10	0.20	7.30
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	0.16	10.16
25/05/2015	20.11	0.00	20.11	6/12/2015	5.00	0.16	5.16
14/06/2015	19.30	0.03	19.34	10/10/2015	10.60	0.15	10.76
9/07/2015	18.40	0.01	18.41	5/01/2015	9.30	0.14	9.44
27/06/2015	17.11	0.00	17.11	30/12/2015	4.80	0.14	4.94
7/10/2015	17.10	0.00	17.10	4/01/2015	9.20	0.12	9.33
6/06/2015	16.90	0.00	16.90	12/03/2015	13.70	0.11	13.81

Table F-18: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R319 , with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.02	29.63				
5/07/2015	24.91	0.01	24.91	19/11/2015	10.80	0.26	11.07
4/07/2015	21.50	0.01	21.51	5/01/2015	9.30	0.20	9.50
7/06/2015	21.20	0.00	21.20	15/02/2015	7.11	0.20	7.31
21/08/2015	20.50	0.00	20.50	15/06/2015	12.60	0.19	12.79
25/05/2015	20.11	0.02	20.12	7/02/2015	9.30	0.18	9.48
14/06/2015	19.30	0.05	19.36	12/09/2015	8.80	0.16	8.97
9/07/2015	18.40	0.05	18.45	18/01/2015	11.00	0.16	11.16
27/06/2015	17.11	0.03	17.14	25/01/2015	7.20	0.16	7.36
7/10/2015	17.10	0.00	17.10	17/10/2015	12.10	0.15	12.26
6/06/2015	16.90	0.02	16.92	8/02/2015	9.00	0.15	9.15

Table F-19: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R1, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.08	48.08	21/11/2015	25.30	0.38	25.68
26/11/2015	45.10	0.00	45.10	5/02/2015	16.00	0.28	16.28
7/10/2015	38.50	0.00	38.50	13/02/2015	13.00	0.27	13.27
17/10/2015	35.30	0.25	35.55	17/10/2015	35.30	0.25	35.55
14/12/2015	34.70	0.09	34.79	4/04/2015	8.50	0.24	8.74
12/12/2015	34.30	0.11	34.41	18/10/2015	26.70	0.23	26.93
15/12/2015	33.40	0.11	33.51	9/02/2015	31.50	0.22	31.72
20/11/2015	32.92	0.04	32.95	11/01/2015	6.00	0.21	6.22
23/11/2015	31.70	0.09	31.79	21/12/2015	27.90	0.21	28.11
9/02/2015	31.50	0.22	31.72	5/09/2015	15.50	0.20	15.70

Table F-20: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R27, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.11	48.11	17/10/2015	35.30	0.40	35.70
26/11/2015	45.10	0.01	45.11	15/12/2015	33.40	0.19	33.59
7/10/2015	38.50	0.00	38.50	21/12/2015	27.90	0.18	28.08
17/10/2015	35.30	0.40	35.70	2/01/2015	26.70	0.16	26.86
14/12/2015	34.70	0.06	34.77	21/02/2015	9.00	0.15	9.15
12/12/2015	34.30	0.07	34.37	6/01/2015	15.30	0.14	15.44
15/12/2015	33.40	0.19	33.59	5/01/2015	25.80	0.14	25.94
20/11/2015	32.92	0.02	32.94	4/02/2015	24.60	0.14	24.74
23/11/2015	31.70	0.12	31.82	29/12/2015	13.90	0.14	14.04
9/02/2015	31.50	0.04	31.54	10/10/2015	28.80	0.13	28.93

Table F-21: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R37, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.03	48.03	23/05/2015	15.60	0.26	15.86
26/11/2015	45.10	0.00	45.10	22/05/2015	8.60	0.22	8.82
7/10/2015	38.50	0.00	38.50	29/01/2015	15.20	0.20	15.40
17/10/2015	35.30	0.02	35.32	16/05/2015	14.70	0.18	14.88
14/12/2015	34.70	0.01	34.71	19/07/2015	13.20	0.17	13.37
12/12/2015	34.30	0.00	34.30	20/07/2015	18.50	0.16	18.66
15/12/2015	33.40	0.00	33.40	27/02/2015	0.00	0.16	0.16
20/11/2015	32.91	0.00	32.91	20/06/2015	12.20	0.16	12.36
23/11/2015	31.70	0.01	31.71	22/04/2015	0.00	0.15	0.15
9/02/2015	31.50	0.00	31.50	29/04/2015	13.00	0.15	13.15

Table F-22: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R46, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	21/08/2015	28.80	0.13	28.94
26/11/2015	45.10	0.03	45.13	23/03/2015	12.30	0.13	12.43
7/10/2015	38.50	0.00	38.50	26/12/2015	11.20	0.12	11.32
17/10/2015	35.30	0.02	35.32	20/12/2015	24.60	0.11	24.72
14/12/2015	34.70	0.00	34.70	16/02/2015	16.30	0.11	16.41
12/12/2015	34.30	0.01	34.31	25/11/2015	30.50	0.11	30.61
15/12/2015	33.40	0.06	33.46	9/07/2015	20.10	0.11	20.21
20/11/2015	32.90	0.00	32.91	30/10/2015	20.90	0.10	21.00
23/11/2015	31.70	0.00	31.70	17/11/2015	16.40	0.09	16.50
9/02/2015	31.50	0.00	31.50	31/10/2015	17.80	0.09	17.89

Table F-23: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R277, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.11	48.11	17/10/2015	35.30	0.49	35.79
26/11/2015	45.10	0.00	45.10	15/12/2015	33.40	0.21	33.61
7/10/2015	38.50	0.00	38.50	6/01/2015	15.30	0.20	15.51
17/10/2015	35.30	0.49	35.79	2/01/2015	26.70	0.16	26.86
14/12/2015	34.70	0.04	34.74	6/12/2015	15.30	0.16	15.46
12/12/2015	34.30	0.11	34.41	10/10/2015	28.80	0.16	28.96
15/12/2015	33.40	0.21	33.61	5/01/2015	25.80	0.14	25.95
20/11/2015	32.92	0.01	32.92	30/12/2015	14.40	0.14	14.54
23/11/2015	31.70	0.06	31.76	4/01/2015	14.20	0.13	14.33
9/02/2015	31.50	0.00	31.50	12/03/2015	25.00	0.12	25.12

Table F-24: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R319, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.01	68.71				
27/11/2015	48.00	0.00	48.00	19/11/2015	31.00	0.27	31.28
26/11/2015	45.10	0.00	45.10	5/01/2015	25.80	0.21	26.01
7/10/2015	38.50	0.00	38.50	15/02/2015	16.11	0.21	16.31
17/10/2015	35.30	0.16	35.46	15/06/2015	20.20	0.19	20.39
14/12/2015	34.71	0.13	34.84	7/02/2015	17.80	0.18	17.98
12/12/2015	34.30	0.00	34.30	12/09/2015	18.40	0.17	18.57
15/12/2015	33.40	0.01	33.41	18/01/2015	24.30	0.17	24.47
20/11/2015	32.91	0.01	32.92	25/01/2015	15.40	0.16	15.56
23/11/2015	31.70	0.05	31.75	17/10/2015	35.30	0.16	35.46
9/02/2015	31.50	0.00	31.50	8/02/2015	16.50	0.15	16.65

Scenario 2, Max LP

Table F-25: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R1, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.00	29.60				
5/07/2015	24.90	0.00	24.90	21/11/2015	7.00	0.40	7.40
4/07/2015	21.50	0.00	21.50	13/02/2015	6.40	0.29	6.69
7/06/2015	21.20	0.00	21.20	5/02/2015	6.70	0.29	6.99
21/08/2015	20.50	0.00	20.50	17/10/2015	12.10	0.26	12.36
25/05/2015	20.10	0.00	20.10	4/04/2015	3.20	0.25	3.45
14/06/2015	19.30	0.01	19.31	18/10/2015	8.40	0.24	8.64
9/07/2015	18.40	0.00	18.40	9/02/2015	11.90	0.24	12.14
27/06/2015	17.10	0.00	17.10	11/01/2015	2.80	0.23	3.03
7/10/2015	17.10	0.00	17.10	21/12/2015	12.40	0.22	12.62
6/06/2015	16.90	0.00	16.90	5/09/2015	8.50	0.21	8.71

Table F-26: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R27, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.01	29.61				
5/07/2015	24.90	0.00	24.90	17/10/2015	12.10	0.44	12.54
4/07/2015	21.50	0.00	21.50	15/12/2015	12.70	0.20	12.90
7/06/2015	21.20	0.00	21.20	21/12/2015	12.40	0.19	12.59
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	0.17	10.17
25/05/2015	20.10	0.00	20.10	21/02/2015	4.10	0.17	4.27
14/06/2015	19.30	0.03	19.33	6/01/2015	7.10	0.15	7.25
9/07/2015	18.40	0.01	18.41	5/01/2015	9.30	0.15	9.45
27/06/2015	17.10	0.00	17.10	4/02/2015	7.70	0.15	7.85
7/10/2015	17.10	0.00	17.10	29/12/2015	3.60	0.14	3.74
6/06/2015	16.90	0.00	16.90	10/10/2015	10.60	0.14	10.74

Table F-27: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R37, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.04	29.64				
5/07/2015	24.90	0.03	24.93	18/04/2015		0.25	0.25
4/07/2015	21.50	0.00	21.50	26/12/2015	6.50	0.23	6.73
7/06/2015	21.20	0.09	21.29	20/12/2015	12.70	0.20	12.90
21/08/2015	20.50	0.17	20.67	23/03/2015	5.80	0.19	5.99
25/05/2015	20.10	0.04	20.14	1/12/2015	7.50	0.18	7.68
14/06/2015	19.30	0.03	19.33	25/11/2015	10.50	0.18	10.68
9/07/2015	18.40	0.16	18.56	16/02/2015	7.30	0.17	7.47
27/06/2015	17.10	0.01	17.11	21/08/2015	20.50	0.17	20.67
7/10/2015	17.10	0.00	17.10	9/07/2015	18.40	0.16	18.56
6/06/2015	16.90	0.00	16.90	1/04/2015		0.16	0.16

Table F-28: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R46, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.03	29.63				
5/07/2015	24.90	0.00	24.90	29/11/2015	7.20	0.31	7.51
4/07/2015	21.50	0.00	21.50	22/11/2015	6.00	0.24	6.24
7/06/2015	21.20	0.00	21.20	13/01/2015	3.00	0.20	3.20
21/08/2015	20.50	0.00	20.50	23/02/2015	5.10	0.20	5.30
25/05/2015	20.10	0.00	20.10	5/11/2015	4.50	0.20	4.70
14/06/2015	19.30	0.03	19.33	3/01/2015	8.30	0.19	8.49
9/07/2015	18.40	0.06	18.46	13/12/2015	6.50	0.19	6.69
27/06/2015	17.10	0.00	17.10	15/12/2015	12.70	0.18	12.88
7/10/2015	17.10	0.00	17.10	14/03/2015	6.80	0.18	6.98
6/06/2015	16.90	0.00	16.90	6/12/2015	5.00	0.17	5.17

Table F-29: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R277, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.01	29.61				
5/07/2015	24.90	0.00	24.90	17/10/2015	12.10	0.55	12.65
4/07/2015	21.50	0.00	21.50	6/01/2015	7.10	0.22	7.32
7/06/2015	21.20	0.00	21.20	15/12/2015	12.70	0.21	12.91
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	0.18	10.18
25/05/2015	20.10	0.00	20.10	6/12/2015	5.00	0.17	5.17
14/06/2015	19.30	0.03	19.33	10/10/2015	10.60	0.17	10.77
9/07/2015	18.40	0.01	18.41	5/01/2015	9.30	0.16	9.46
27/06/2015	17.10	0.00	17.10	30/12/2015	4.80	0.15	4.95
7/10/2015	17.10	0.00	17.10	4/01/2015	9.20	0.14	9.34
6/06/2015	16.90	0.00	16.90	12/03/2015	13.70	0.13	13.83

Table F-30: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R319 , without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.03	29.63				
5/07/2015	24.90	0.01	24.91	15/02/2015	7.10	0.29	7.39
4/07/2015	21.50	0.01	21.51	19/11/2015	10.80	0.28	11.08
7/06/2015	21.20	0.00	21.20	7/02/2015	9.30	0.18	9.48
21/08/2015	20.50	0.00	20.50	12/09/2015	8.80	0.18	8.98
25/05/2015	20.10	0.02	20.12	5/01/2015	9.30	0.18	9.48
14/06/2015	19.30	0.06	19.36	18/01/2015	11.00	0.18	11.18
9/07/2015	18.40	0.05	18.45	25/01/2015	7.20	0.17	7.37
27/06/2015	17.10	0.05	17.15	31/12/2015	6.60	0.17	6.77
7/10/2015	17.10	0.00	17.10	5/10/2015	9.20	0.16	9.36
6/06/2015	16.90	0.02	16.92	8/02/2015	9.00	0.16	9.16

Table F-31: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R1, E without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.09	48.09	21/11/2015	25.30	0.41	25.71
26/11/2015	45.10	0.00	45.10	13/02/2015	13.00	0.30	13.30
7/10/2015	38.50	0.00	38.50	5/02/2015	16.00	0.30	16.30
17/10/2015	35.30	0.27	35.57	17/10/2015	35.30	0.27	35.57
14/12/2015	34.70	0.09	34.79	4/04/2015	8.50	0.26	8.76
12/12/2015	34.30	0.12	34.42	18/10/2015	26.70	0.25	26.95
15/12/2015	33.40	0.12	33.52	9/02/2015	31.50	0.24	31.74
20/11/2015	32.90	0.04	32.94	11/01/2015	6.00	0.23	6.23
23/11/2015	31.70	0.10	31.80	21/12/2015	27.90	0.22	28.12
9/02/2015	31.50	0.24	31.74	5/09/2015	15.50	0.21	15.71

Table F-32: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R27, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.12	48.12	17/10/2015	35.30	0.45	35.75
26/11/2015	45.10	0.01	45.11	15/12/2015	33.40	0.21	33.61
7/10/2015	38.50	0.00	38.50	21/12/2015	27.90	0.19	28.09
17/10/2015	35.30	0.45	35.75	2/01/2015	26.70	0.18	26.88
14/12/2015	34.70	0.07	34.77	21/02/2015	9.00	0.17	9.17
12/12/2015	34.30	0.08	34.38	6/01/2015	15.30	0.16	15.46
15/12/2015	33.40	0.21	33.61	5/01/2015	25.80	0.16	25.96
20/11/2015	32.90	0.03	32.93	4/02/2015	24.60	0.15	24.75
23/11/2015	31.70	0.13	31.83	29/12/2015	13.90	0.15	14.05
9/02/2015	31.50	0.04	31.54	10/10/2015	28.80	0.14	28.94

Table F-33: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R37, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	18/04/2015	16.50	0.26	16.76
26/11/2015	45.10	0.11	45.21	26/12/2015	11.20	0.23	11.43
7/10/2015	38.50	0.00	38.50	20/12/2015	24.60	0.21	24.81
17/10/2015	35.30	0.02	35.32	23/03/2015	12.30	0.20	12.50
14/12/2015	34.70	0.00	34.70	1/12/2015	23.00	0.19	23.19
12/12/2015	34.30	0.01	34.31	25/11/2015	30.50	0.19	30.69
15/12/2015	33.40	0.06	33.46	16/02/2015	16.30	0.18	16.48
20/11/2015	32.90	0.01	32.91	21/08/2015	28.80	0.17	28.97
23/11/2015	31.70	0.00	31.70	9/07/2015	20.10	0.17	20.27
9/02/2015	31.50	0.00	31.50	1/04/2015	10.80	0.17	10.97

Table F-34: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R46, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	29/11/2015	25.40	0.32	25.72
26/11/2015	45.10	0.00	45.10	22/11/2015	22.10	0.24	22.34
7/10/2015	38.50	0.00	38.50	13/01/2015	9.10	0.21	9.31
17/10/2015	35.30	0.04	35.34	23/02/2015	10.80	0.21	11.01
14/12/2015	34.70	0.00	34.70	5/11/2015	9.80	0.20	10.00
12/12/2015	34.30	0.02	34.32	3/01/2015	15.70	0.20	15.90
15/12/2015	33.40	0.19	33.59	13/12/2015	26.50	0.20	26.70
20/11/2015	32.90	0.00	32.90	15/12/2015	33.40	0.19	33.59
23/11/2015	31.70	0.00	31.70	14/03/2015	13.80	0.18	13.98
9/02/2015	31.50	0.00	31.50	6/12/2015	15.30	0.18	15.48

Table F-35: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R277, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.12	48.12	17/10/2015	35.30	0.57	35.87
26/11/2015	45.10	0.00	45.10	6/01/2015	15.30	0.23	15.53
7/10/2015	38.50	0.00	38.50	15/12/2015	33.40	0.22	33.62
17/10/2015	35.30	0.57	35.87	2/01/2015	26.70	0.19	26.89
14/12/2015	34.70	0.04	34.74	6/12/2015	15.30	0.18	15.48
12/12/2015	34.30	0.12	34.42	10/10/2015	28.80	0.18	28.98
15/12/2015	33.40	0.22	33.62	5/01/2015	25.80	0.16	25.96
20/11/2015	32.90	0.01	32.91	30/12/2015	14.40	0.16	14.56
23/11/2015	31.70	0.06	31.76	4/01/2015	14.20	0.14	14.34
9/02/2015	31.50	0.00	31.50	12/03/2015	25.00	0.13	25.13

Table F-36: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R319, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.01	68.71				
27/11/2015	48.00	0.00	48.00	15/02/2015	16.10	0.30	16.40
26/11/2015	45.10	0.00	45.10	19/11/2015	31.00	0.28	31.28
7/10/2015	38.50	0.00	38.50	7/02/2015	17.80	0.19	17.99
17/10/2015	35.30	0.15	35.45	12/09/2015	18.40	0.19	18.59
14/12/2015	34.70	0.15	34.85	5/01/2015	25.80	0.19	25.99
12/12/2015	34.30	0.00	34.30	18/01/2015	24.30	0.18	24.48
15/12/2015	33.40	0.01	33.41	25/01/2015	15.40	0.18	15.58
20/11/2015	32.90	0.01	32.91	31/12/2015	17.70	0.18	17.88
23/11/2015	31.70	0.05	31.75	5/10/2015	20.70	0.17	20.87
9/02/2015	31.50	0.00	31.50	8/02/2015	16.50	0.16	16.66

Table F-37: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R1, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.61	0.00	29.61				
5/07/2015	24.91	0.00	24.91	21/11/2015	7.00	0.40	7.40
4/07/2015	21.50	0.00	21.50	13/02/2015	6.40	0.29	6.69
7/06/2015	21.20	0.00	21.20	5/02/2015	6.70	0.29	6.99
21/08/2015	20.50	0.00	20.50	17/10/2015	12.10	0.26	12.36
25/05/2015	20.11	0.00	20.11	4/04/2015	3.20	0.25	3.45
14/06/2015	19.31	0.01	19.32	18/10/2015	8.40	0.24	8.64
9/07/2015	18.40	0.00	18.40	9/02/2015	11.90	0.24	12.14
27/06/2015	17.11	0.00	17.11	11/01/2015	2.80	0.23	3.03
7/10/2015	17.10	0.00	17.10	21/12/2015	12.40	0.22	12.62
6/06/2015	16.90	0.00	16.90	5/09/2015	8.50	0.21	8.71

Table F-38: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R27, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.01	29.61				
5/07/2015	24.91	0.00	24.91	17/10/2015	12.10	0.44	12.54
4/07/2015	21.50	0.00	21.50	15/12/2015	12.70	0.20	12.90
7/06/2015	21.20	0.00	21.20	21/12/2015	12.40	0.19	12.59
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	0.17	10.17
25/05/2015	20.11	0.00	20.11	21/02/2015	4.10	0.17	4.27
14/06/2015	19.30	0.03	19.33	6/01/2015	7.10	0.15	7.25
9/07/2015	18.40	0.01	18.41	5/01/2015	9.30	0.15	9.45
27/06/2015	17.11	0.00	17.11	4/02/2015	7.70	0.15	7.85
7/10/2015	17.10	0.00	17.10	29/12/2015	3.60	0.14	3.74
6/06/2015	16.90	0.00	16.90	10/10/2015	10.60	0.14	10.74

Table F-39 Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R37, License limit scenario, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.04	29.64				
5/07/2015	24.90	0.03	24.93	18/04/2015	0.00	0.25	0.25
4/07/2015	21.50	0.00	21.50	26/12/2015	6.50	0.23	6.73
7/06/2015	21.20	0.09	21.29	20/12/2015	12.70	0.20	12.90
21/08/2015	20.50	0.17	20.67	23/03/2015	5.80	0.19	5.99
25/05/2015	20.10	0.04	20.14	1/12/2015	7.51	0.18	7.69
14/06/2015	19.30	0.03	19.34	25/11/2015	10.50	0.18	10.68
9/07/2015	18.40	0.16	18.56	16/02/2015	7.30	0.17	7.47
27/06/2015	17.10	0.01	17.11	21/08/2015	20.50	0.17	20.67
7/10/2015	17.10	0.00	17.10	9/07/2015	18.40	0.16	18.56
6/06/2015	16.90	0.00	16.90	1/04/2015	0.00	0.16	0.16

Table F-40: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R46, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.03	29.63				
5/07/2015	24.91	0.00	24.91	29/11/2015	7.20	0.31	7.51
4/07/2015	21.50	0.00	21.50	22/11/2015	6.00	0.24	6.24
7/06/2015	21.20	0.00	21.21	13/01/2015	3.00	0.20	3.21
21/08/2015	20.50	0.00	20.51	23/02/2015	5.10	0.20	5.30
25/05/2015	20.10	0.00	20.11	5/11/2015	4.50	0.20	4.70
14/06/2015	19.30	0.03	19.34	3/01/2015	8.30	0.19	8.49
9/07/2015	18.40	0.06	18.46	13/12/2015	6.50	0.19	6.69
27/06/2015	17.10	0.00	17.10	15/12/2015	12.70	0.18	12.88
7/10/2015	17.10	0.00	17.10	14/03/2015	6.80	0.18	6.98
6/06/2015	16.90	0.00	16.90	6/12/2015	5.00	0.17	5.17

Table F-41: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R277, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.01	29.61				
5/07/2015	24.91	0.00	24.91	17/10/2015	12.10	0.55	12.66
4/07/2015	21.50	0.00	21.50	6/01/2015	7.10	0.22	7.32
7/06/2015	21.20	0.00	21.20	15/12/2015	12.70	0.21	12.91
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	0.18	10.18
25/05/2015	20.11	0.00	20.11	6/12/2015	5.00	0.17	5.17
14/06/2015	19.30	0.03	19.34	10/10/2015	10.60	0.17	10.78
9/07/2015	18.40	0.01	18.41	5/01/2015	9.30	0.16	9.46
27/06/2015	17.11	0.00	17.11	30/12/2015	4.80	0.15	4.95
7/10/2015	17.10	0.00	17.10	4/01/2015	9.20	0.14	9.34
6/06/2015	16.90	0.00	16.90	12/03/2015	13.70	0.13	13.83

Table F-42: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R319 , with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.03	29.63				
5/07/2015	24.91	0.01	24.91	15/02/2015	7.11	0.29	7.40
4/07/2015	21.50	0.01	21.51	19/11/2015	10.80	0.28	11.08
7/06/2015	21.20	0.00	21.20	7/02/2015	9.30	0.18	9.49
21/08/2015	20.50	0.00	20.50	12/09/2015	8.80	0.18	8.98
25/05/2015	20.11	0.02	20.13	5/01/2015	9.30	0.18	9.48
14/06/2015	19.30	0.06	19.36	18/01/2015	11.00	0.18	11.18
9/07/2015	18.40	0.05	18.45	25/01/2015	7.20	0.17	7.37
27/06/2015	17.11	0.05	17.16	31/12/2015	6.60	0.17	6.77
7/10/2015	17.10	0.00	17.10	5/10/2015	9.20	0.16	9.36
6/06/2015	16.90	0.02	16.93	8/02/2015	9.00	0.16	9.16

Table F-43: Cumulative 24-hour average PM_{10} concentration (μg/m³) – Receptor R1, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.09	48.09	21/11/2015	25.30	0.41	25.71
26/11/2015	45.10	0.00	45.10	13/02/2015	13.00	0.30	13.30
7/10/2015	38.50	0.00	38.50	5/02/2015	16.00	0.30	16.30
17/10/2015	35.30	0.27	35.57	17/10/2015	35.30	0.27	35.57
14/12/2015	34.70	0.09	34.80	4/04/2015	8.50	0.26	8.76
12/12/2015	34.30	0.12	34.42	18/10/2015	26.70	0.25	26.95
15/12/2015	33.40	0.12	33.52	9/02/2015	31.50	0.24	31.74
20/11/2015	32.92	0.04	32.96	11/01/2015	6.00	0.23	6.23
23/11/2015	31.70	0.10	31.80	21/12/2015	27.90	0.22	28.13
9/02/2015	31.50	0.24	31.74	5/09/2015	15.50	0.21	15.71

Table F-44: Cumulative 24-hour average PM_{10} concentration (μg/m³) – Receptor R27, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.12	48.12	17/10/2015	35.30	0.45	35.75
26/11/2015	45.10	0.01	45.11	15/12/2015	33.40	0.21	33.61
7/10/2015	38.50	0.00	38.50	21/12/2015	27.90	0.19	28.09
17/10/2015	35.30	0.45	35.75	2/01/2015	26.70	0.18	26.88
14/12/2015	34.70	0.07	34.77	21/02/2015	9.00	0.17	9.17
12/12/2015	34.30	0.08	34.38	6/01/2015	15.30	0.16	15.46
15/12/2015	33.40	0.21	33.61	5/01/2015	25.80	0.16	25.96
20/11/2015	32.92	0.03	32.94	4/02/2015	24.60	0.15	24.75
23/11/2015	31.70	0.13	31.83	29/12/2015	13.90	0.15	14.05
9/02/2015	31.50	0.04	31.54	10/10/2015	28.80	0.14	28.94

Table F-45: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R37, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	18/04/2015	16.50	0.26	16.76
26/11/2015	45.10	0.11	45.21	26/12/2015	11.20	0.23	11.43
7/10/2015	38.50	0.00	38.50	20/12/2015	24.60	0.21	24.81
17/10/2015	35.30	0.02	35.32	23/03/2015	12.30	0.20	12.50
14/12/2015	34.70	0.00	34.70	1/12/2015	23.01	0.19	23.20
12/12/2015	34.30	0.01	34.31	25/11/2015	30.50	0.19	30.69
15/12/2015	33.40	0.06	33.46	16/02/2015	16.30	0.18	16.48
20/11/2015	32.91	0.01	32.91	21/08/2015	28.80	0.17	28.98
23/11/2015	31.70	0.00	31.70	9/07/2015	20.10	0.17	20.27
9/02/2015	31.50	0.00	31.50	1/04/2015	10.80	0.17	10.97

Table F-46: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R46, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	29/11/2015	25.40	0.32	25.72
26/11/2015	45.10	0.00	45.10	22/11/2015	22.10	0.24	22.34
7/10/2015	38.50	0.00	38.50	13/01/2015	9.10	0.21	9.31
17/10/2015	35.30	0.04	35.34	23/02/2015	10.80	0.21	11.01
14/12/2015	34.70	0.00	34.71	5/11/2015	9.80	0.20	10.00
12/12/2015	34.30	0.02	34.32	3/01/2015	15.70	0.20	15.90
15/12/2015	33.40	0.19	33.59	13/12/2015	26.50	0.20	26.70
20/11/2015	32.90	0.00	32.91	15/12/2015	33.40	0.19	33.59
23/11/2015	31.70	0.00	31.70	14/03/2015	13.80	0.18	13.99
9/02/2015	31.50	0.00	31.50	6/12/2015	15.30	0.18	15.48

Table F-47: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R277, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.12	48.12	17/10/2015	35.30	0.57	35.87
26/11/2015	45.10	0.00	45.10	6/01/2015	15.30	0.23	15.53
7/10/2015	38.50	0.00	38.50	15/12/2015	33.40	0.22	33.62
17/10/2015	35.30	0.57	35.87	2/01/2015	26.70	0.19	26.89
14/12/2015	34.70	0.04	34.75	6/12/2015	15.30	0.18	15.48
12/12/2015	34.30	0.12	34.42	10/10/2015	28.80	0.18	28.98
15/12/2015	33.40	0.22	33.62	5/01/2015	25.80	0.16	25.96
20/11/2015	32.92	0.01	32.92	30/12/2015	14.40	0.16	14.56
23/11/2015	31.70	0.06	31.76	4/01/2015	14.20	0.14	14.35
9/02/2015	31.50	0.00	31.50	12/03/2015	25.00	0.13	25.13

Table F-48: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R319, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.01	68.71				
27/11/2015	48.00	0.00	48.00	15/02/2015	16.11	0.30	16.41
26/11/2015	45.10	0.00	45.10	19/11/2015	31.00	0.28	31.29
7/10/2015	38.50	0.00	38.50	7/02/2015	17.80	0.19	17.99
17/10/2015	35.30	0.15	35.45	12/09/2015	18.40	0.19	18.59
14/12/2015	34.71	0.15	34.85	5/01/2015	25.80	0.19	25.99
12/12/2015	34.30	0.00	34.30	18/01/2015	24.30	0.18	24.48
15/12/2015	33.40	0.01	33.41	25/01/2015	15.40	0.18	15.58
20/11/2015	32.91	0.01	32.92	31/12/2015	17.70	0.18	17.88
23/11/2015	31.70	0.05	31.75	5/10/2015	20.70	0.17	20.87
9/02/2015	31.50	0.00	31.50	8/02/2015	16.50	0.16	16.67

Scenario 4, Max LP 24-hour

Table F-49: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R1, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.02	29.60				
5/07/2015	24.90	0.00	24.90	21/11/2015	7.00	2.37	7.40
4/07/2015	21.50	0.00	21.50	13/02/2015	6.40	1.74	6.69
7/06/2015	21.20	0.00	21.20	5/02/2015	6.70	1.73	6.99
21/08/2015	20.50	0.00	20.50	17/10/2015	12.10	1.56	12.36
25/05/2015	20.10	0.00	20.10	4/04/2015	3.20	1.51	3.45
14/06/2015	19.30	0.08	19.31	18/10/2015	8.40	1.46	8.64
9/07/2015	18.40	0.01	18.40	9/02/2015	11.90	1.41	12.14
27/06/2015	17.10	0.00	17.10	11/01/2015	2.80	1.36	3.03
7/10/2015	17.10	0.03	17.10	21/12/2015	12.40	1.31	12.62
6/06/2015	16.90	0.00	16.90	5/09/2015	8.50	1.23	8.71

Table F-50: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R27, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.04	29.61				
5/07/2015	24.90	0.00	24.90	17/10/2015	12.10	2.63	12.54
4/07/2015	21.50	0.01	21.50	15/12/2015	12.70	1.19	12.90
7/06/2015	21.20	0.00	21.20	21/12/2015	12.40	1.13	12.59
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	1.04	10.17
25/05/2015	20.10	0.02	20.10	21/02/2015	4.10	0.99	4.27
14/06/2015	19.30	0.18	19.33	6/01/2015	7.10	0.93	7.25
9/07/2015	18.40	0.05	18.41	5/01/2015	9.30	0.90	9.45
27/06/2015	17.10	0.02	17.10	4/02/2015	7.70	0.88	7.85
7/10/2015	17.10	0.01	17.10	29/12/2015	3.60	0.87	3.74
6/06/2015	16.90	0.00	16.90	10/10/2015	10.60	0.81	10.74

Table F-51: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R37, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.23	29.64				
5/07/2015	24.90	0.18	24.93	18/04/2015		1.52	0.25
4/07/2015	21.50	0.00	21.50	26/12/2015	6.50	1.35	6.73
7/06/2015	21.20	0.55	21.29	20/12/2015	12.70	1.21	12.90
21/08/2015	20.50	1.01	20.67	23/03/2015	5.80	1.17	5.99
25/05/2015	20.10	0.22	20.14	1/12/2015	7.50	1.09	7.68
14/06/2015	19.30	0.20	19.33	25/11/2015	10.50	1.08	10.68
9/07/2015	18.40	0.97	18.56	16/02/2015	7.30	1.02	7.47
27/06/2015	17.10	0.04	17.11	21/08/2015	20.50	1.01	20.67
7/10/2015	17.10	0.00	17.10	9/07/2015	18.40	0.97	18.56
6/06/2015	16.90	0.01	16.90	1/04/2015		0.96	0.16

Table F-52: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R46, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.17	29.63				
5/07/2015	24.90	0.00	24.90	29/11/2015	7.20	1.88	7.51
4/07/2015	21.50	0.00	21.50	22/11/2015	6.00	1.42	6.24
7/06/2015	21.20	0.03	21.20	13/01/2015	3.00	1.23	3.20
21/08/2015	20.50	0.02	20.50	23/02/2015	5.10	1.23	5.30
25/05/2015	20.10	0.01	20.10	5/11/2015	4.50	1.17	4.70
14/06/2015	19.30	0.20	19.33	3/01/2015	8.30	1.16	8.49
9/07/2015	18.40	0.33	18.46	13/12/2015	6.50	1.14	6.69
27/06/2015	17.10	0.00	17.10	15/12/2015	12.70	1.10	12.88
7/10/2015	17.10	0.00	17.10	14/03/2015	6.80	1.07	6.98
6/06/2015	16.90	0.00	16.90	6/12/2015	5.00	1.03	5.17

Table F-53: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R277, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.04	29.61				
5/07/2015	24.90	0.00	24.90	17/10/2015	12.10	3.32	12.65
4/07/2015	21.50	0.00	21.50	6/01/2015	7.10	1.32	7.32
7/06/2015	21.20	0.00	21.20	15/12/2015	12.70	1.29	12.91
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	1.09	10.18
25/05/2015	20.10	0.02	20.10	6/12/2015	5.00	1.04	5.17
14/06/2015	19.30	0.21	19.33	10/10/2015	10.60	1.03	10.77
9/07/2015	18.40	0.05	18.41	5/01/2015	9.30	0.94	9.46
27/06/2015	17.10	0.03	17.10	30/12/2015	4.80	0.92	4.95
7/10/2015	17.10	0.00	17.10	4/01/2015	9.20	0.83	9.34
6/06/2015	16.90	0.00	16.90	12/03/2015	13.70	0.76	13.83

Table F-54: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R319 , without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.15	29.63				
5/07/2015	24.90	0.05	24.91	15/02/2015	7.10	1.77	7.39
4/07/2015	21.50	0.07	21.51	19/11/2015	10.80	1.65	11.08
7/06/2015	21.20	0.00	21.20	7/02/2015	9.30	1.10	9.48
21/08/2015	20.50	0.00	20.50	12/09/2015	8.80	1.10	8.98
25/05/2015	20.10	0.14	20.12	5/01/2015	9.30	1.08	9.48
14/06/2015	19.30	0.35	19.36	18/01/2015	11.00	1.07	11.18
9/07/2015	18.40	0.29	18.45	25/01/2015	7.20	1.04	7.37
27/06/2015	17.10	0.28	17.15	31/12/2015	6.60	1.02	6.77
7/10/2015	17.10	0.00	17.10	5/10/2015	9.20	0.97	9.36
6/06/2015	16.90	0.14	16.92	8/02/2015	9.00	0.95	9.16

Table F-55: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R1, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.54	48.54	21/11/2015	25.30	2.45	27.75
26/11/2015	45.10	0.01	45.11	13/02/2015	13.00	1.80	14.80
7/10/2015	38.50	0.03	38.53	5/02/2015	16.00	1.79	17.79
17/10/2015	35.30	1.61	36.91	17/10/2015	35.30	1.61	36.91
14/12/2015	34.70	0.57	35.27	4/04/2015	8.50	1.56	10.06
12/12/2015	34.30	0.70	35.00	18/10/2015	26.70	1.50	28.20
15/12/2015	33.40	0.72	34.12	9/02/2015	31.50	1.46	32.96
20/11/2015	32.90	0.22	33.12	11/01/2015	6.00	1.40	7.40
23/11/2015	31.70	0.59	32.29	21/12/2015	27.90	1.35	29.25
9/02/2015	31.50	1.46	32.96	5/09/2015	15.50	1.27	16.77

Table F-56: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R27, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.72	48.72	17/10/2015	35.30	2.71	38.01
26/11/2015	45.10	0.08	45.18	15/12/2015	33.40	1.23	34.63
7/10/2015	38.50	0.01	38.51	21/12/2015	27.90	1.16	29.06
17/10/2015	35.30	2.71	38.01	2/01/2015	26.70	1.07	27.77
14/12/2015	34.70	0.40	35.10	21/02/2015	9.00	1.03	10.03
12/12/2015	34.30	0.47	34.77	6/01/2015	15.30	0.96	16.26
15/12/2015	33.40	1.23	34.63	5/01/2015	25.80	0.93	26.73
20/11/2015	32.90	0.16	33.06	4/02/2015	24.60	0.90	25.50
23/11/2015	31.70	0.77	32.47	29/12/2015	13.90	0.89	14.79
9/02/2015	31.50	0.26	31.76	10/10/2015	28.80	0.84	29.64

Table F-57: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R37, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	18/04/2015	16.50	1.57	18.07
26/11/2015	45.10	0.65	45.75	26/12/2015	11.20	1.40	12.60
7/10/2015	38.50	0.00	38.50	20/12/2015	24.60	1.24	25.84
17/10/2015	35.30	0.14	35.44	23/03/2015	12.30	1.20	13.50
14/12/2015	34.70	0.02	34.72	1/12/2015	23.00	1.13	24.13
12/12/2015	34.30	0.04	34.34	25/11/2015	30.50	1.11	31.61
15/12/2015	33.40	0.34	33.74	16/02/2015	16.30	1.05	17.35
20/11/2015	32.90	0.05	32.95	21/08/2015	28.80	1.05	29.85
23/11/2015	31.70	0.01	31.71	9/07/2015	20.10	1.00	21.10
9/02/2015	31.50	0.00	31.50	1/04/2015	10.80	0.99	11.79

Table F-58: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R46, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	29/11/2015	25.40	1.94	27.34
26/11/2015	45.10	0.00	45.10	22/11/2015	22.10	1.47	23.57
7/10/2015	38.50	0.00	38.50	13/01/2015	9.10	1.27	10.37
17/10/2015	35.30	0.24	35.54	23/02/2015	10.80	1.27	12.07
14/12/2015	34.70	0.03	34.73	5/11/2015	9.80	1.21	11.01
12/12/2015	34.30	0.10	34.40	3/01/2015	15.70	1.20	16.90
15/12/2015	33.40	1.14	34.54	13/12/2015	26.50	1.17	27.67
20/11/2015	32.90	0.02	32.92	15/12/2015	33.40	1.14	34.54
23/11/2015	31.70	0.00	31.70	14/03/2015	13.80	1.11	14.91
9/02/2015	31.50	0.00	31.50	6/12/2015	15.30	1.06	16.36

Table F-59: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R277, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.71	48.71	17/10/2015	35.30	3.42	38.72
26/11/2015	45.10	0.00	45.10	6/01/2015	15.30	1.36	16.66
7/10/2015	38.50	0.00	38.50	15/12/2015	33.40	1.33	34.73
17/10/2015	35.30	3.42	38.72	2/01/2015	26.70	1.12	27.82
14/12/2015	34.70	0.25	34.95	6/12/2015	15.30	1.07	16.37
12/12/2015	34.30	0.70	35.00	10/10/2015	28.80	1.07	29.87
15/12/2015	33.40	1.33	34.73	5/01/2015	25.80	0.97	26.77
20/11/2015	32.90	0.04	32.94	30/12/2015	14.40	0.95	15.35
23/11/2015	31.70	0.39	32.09	4/01/2015	14.20	0.86	15.06
9/02/2015	31.50	0.01	31.51	12/03/2015	25.00	0.78	25.78

Table F-60: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R319, without contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.05	68.75				
27/11/2015	48.00	0.00	48.00	15/02/2015	16.10	1.83	17.93
26/11/2015	45.10	0.00	45.10	19/11/2015	31.00	1.71	32.71
7/10/2015	38.50	0.00	38.50	7/02/2015	17.80	1.13	18.93
17/10/2015	35.30	0.87	36.17	12/09/2015	18.40	1.13	19.53
14/12/2015	34.70	0.88	35.58	5/01/2015	25.80	1.11	26.91
12/12/2015	34.30	0.01	34.31	18/01/2015	24.30	1.10	25.40
15/12/2015	33.40	0.09	33.49	25/01/2015	15.40	1.07	16.47
20/11/2015	32.90	0.03	32.93	31/12/2015	17.70	1.05	18.75
23/11/2015	31.70	0.30	32.00	5/10/2015	20.70	1.00	21.70
9/02/2015	31.50	0.00	31.50	8/02/2015	16.50	0.98	17.48

Table F-61: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R1, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	**29.61**	0.02	**29.63**				
5/07/2015	24.91	0.00	24.91	21/11/2015	7.00	2.37	7.40
4/07/2015	21.50	0.00	21.50	13/02/2015	6.40	1.74	6.69
7/06/2015	21.20	0.00	21.20	5/02/2015	6.70	1.73	6.99
21/08/2015	20.50	0.00	20.50	17/10/2015	12.10	1.56	12.36
25/05/2015	20.11	0.00	20.11	4/04/2015	3.20	1.51	3.45
14/06/2015	19.31	0.08	19.32	18/10/2015	8.40	1.46	8.64
9/07/2015	18.40	0.01	18.40	9/02/2015	11.90	1.41	12.14
27/06/2015	17.11	0.00	17.11	11/01/2015	2.80	1.36	3.03
7/10/2015	17.10	0.03	17.10	21/12/2015	12.40	1.31	12.62
6/06/2015	16.90	0.00	16.90	5/09/2015	8.50	1.23	8.71

Table F-62: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R27, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	**29.60**	0.04	**29.61**				
5/07/2015	24.91	0.00	24.91	17/10/2015	12.10	2.63	12.54
4/07/2015	21.50	0.01	21.50	15/12/2015	12.70	1.19	12.90
7/06/2015	21.20	0.00	21.20	21/12/2015	12.40	1.13	12.59
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	1.04	10.17
25/05/2015	20.11	0.02	20.11	21/02/2015	4.10	0.99	4.27
14/06/2015	19.30	0.18	19.33	6/01/2015	7.10	0.93	7.25
9/07/2015	18.40	0.05	18.41	5/01/2015	9.30	0.90	9.45
27/06/2015	17.11	0.02	17.11	4/02/2015	7.70	0.88	7.85
7/10/2015	17.10	0.01	17.10	29/12/2015	3.60	0.87	3.74
6/06/2015	16.90	0.00	16.90	10/10/2015	10.60	0.81	10.74

Table F-63: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R37, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.23	29.64				
5/07/2015	24.90	0.18	24.93	18/04/2015	0.00	1.52	0.25
4/07/2015	21.50	0.00	21.50	26/12/2015	6.50	1.35	6.73
7/06/2015	21.20	0.55	21.29	20/12/2015	12.70	1.21	12.90
21/08/2015	20.50	1.01	20.67	23/03/2015	5.80	1.17	5.99
25/05/2015	20.10	0.22	20.14	1/12/2015	7.51	1.09	7.69
14/06/2015	19.30	0.20	19.34	25/11/2015	10.50	1.08	10.68
9/07/2015	18.40	0.97	18.56	16/02/2015	7.30	1.02	7.47
27/06/2015	17.10	0.04	17.11	21/08/2015	20.50	1.01	20.67
7/10/2015	17.10	0.00	17.10	9/07/2015	18.40	0.97	18.56
6/06/2015	16.90	0.01	16.90	1/04/2015	0.00	0.96	0.16

Table F-64: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R46, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.17	29.63				
5/07/2015	24.91	0.00	24.91	29/11/2015	7.20	1.88	7.51
4/07/2015	21.50	0.00	21.50	22/11/2015	6.00	1.42	6.24
7/06/2015	21.20	0.03	21.21	13/01/2015	3.00	1.23	3.21
21/08/2015	20.50	0.02	20.51	23/02/2015	5.10	1.23	5.30
25/05/2015	20.10	0.01	20.11	5/11/2015	4.50	1.17	4.70
14/06/2015	19.30	0.20	19.34	3/01/2015	8.30	1.16	8.49
9/07/2015	18.40	0.33	18.46	13/12/2015	6.50	1.14	6.69
27/06/2015	17.10	0.00	17.10	15/12/2015	12.70	1.10	12.88
7/10/2015	17.10	0.00	17.10	14/03/2015	6.80	1.07	6.98
6/06/2015	16.90	0.00	16.90	6/12/2015	5.00	1.03	5.17

Table F-65: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R277, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.04	29.61				
5/07/2015	24.91	0.00	24.91	17/10/2015	12.10	3.32	12.66
4/07/2015	21.50	0.00	21.50	6/01/2015	7.10	1.32	7.32
7/06/2015	21.20	0.00	21.20	15/12/2015	12.70	1.29	12.91
21/08/2015	20.50	0.00	20.50	2/01/2015	10.00	1.09	10.18
25/05/2015	20.11	0.02	20.11	6/12/2015	5.00	1.04	5.17
14/06/2015	19.30	0.21	19.34	10/10/2015	10.60	1.03	10.78
9/07/2015	18.40	0.05	18.41	5/01/2015	9.30	0.94	9.46
27/06/2015	17.11	0.03	17.11	30/12/2015	4.80	0.92	4.95
7/10/2015	17.10	0.00	17.10	4/01/2015	9.20	0.83	9.34
6/06/2015	16.90	0.00	16.90	12/03/2015	13.70	0.76	13.83

Table F-66: Cumulative 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R319 , with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
28/06/2015	29.60	0.15	29.63				
5/07/2015	24.91	0.05	24.91	15/02/2015	7.11	1.77	7.40
4/07/2015	21.50	0.07	21.51	19/11/2015	10.80	1.65	11.08
7/06/2015	21.20	0.00	21.20	7/02/2015	9.30	1.10	9.49
21/08/2015	20.50	0.00	20.50	12/09/2015	8.80	1.10	8.98
25/05/2015	20.11	0.14	20.13	5/01/2015	9.30	1.08	9.48
14/06/2015	19.30	0.35	19.36	18/01/2015	11.00	1.07	11.18
9/07/2015	18.40	0.29	18.45	25/01/2015	7.20	1.04	7.37
27/06/2015	17.11	0.28	17.16	31/12/2015	6.60	1.02	6.77
7/10/2015	17.10	0.00	17.10	5/10/2015	9.20	0.97	9.36
6/06/2015	16.90	0.14	16.93	8/02/2015	9.00	0.95	9.16

Table F-67: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R1, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.54	48.09	21/11/2015	25.30	2.45	25.71
26/11/2015	45.10	0.01	45.10	13/02/2015	13.00	1.80	13.30
7/10/2015	38.50	0.03	38.50	5/02/2015	16.00	1.79	16.30
17/10/2015	35.30	1.61	35.57	17/10/2015	35.30	1.61	35.57
14/12/2015	34.70	0.57	34.80	4/04/2015	8.50	1.56	8.76
12/12/2015	34.30	0.70	34.42	18/10/2015	26.70	1.50	26.95
15/12/2015	33.40	0.72	33.52	9/02/2015	31.50	1.46	31.74
20/11/2015	32.92	0.22	32.96	11/01/2015	6.00	1.40	6.23
23/11/2015	31.70	0.59	31.80	21/12/2015	27.90	1.35	28.13
9/02/2015	31.50	1.46	31.74	5/09/2015	15.50	1.27	15.71

Table F-68: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R27, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.72	48.12	17/10/2015	35.30	2.71	35.75
26/11/2015	45.10	0.08	45.11	15/12/2015	33.40	1.23	33.61
7/10/2015	38.50	0.01	38.50	21/12/2015	27.90	1.16	28.09
17/10/2015	35.30	2.71	35.75	2/01/2015	26.70	1.07	26.88
14/12/2015	34.70	0.40	34.77	21/02/2015	9.00	1.03	9.17
12/12/2015	34.30	0.47	34.38	6/01/2015	15.30	0.96	15.46
15/12/2015	33.40	1.23	33.61	5/01/2015	25.80	0.93	25.96
20/11/2015	32.92	0.16	32.94	4/02/2015	24.60	0.90	24.75
23/11/2015	31.70	0.77	31.83	29/12/2015	13.90	0.89	14.05
9/02/2015	31.50	0.26	31.54	10/10/2015	28.80	0.84	28.94

Table F-69: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R37, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	18/04/2015	16.50	1.57	16.76
26/11/2015	45.10	0.65	45.21	26/12/2015	11.20	1.40	11.43
7/10/2015	38.50	0.00	38.50	20/12/2015	24.60	1.24	24.81
17/10/2015	35.30	0.14	35.32	23/03/2015	12.30	1.20	12.50
14/12/2015	34.70	0.02	34.70	1/12/2015	23.01	1.13	23.20
12/12/2015	34.30	0.04	34.31	25/11/2015	30.50	1.11	30.69
15/12/2015	33.40	0.34	33.46	16/02/2015	16.30	1.05	16.48
20/11/2015	32.91	0.05	32.91	21/08/2015	28.80	1.05	28.98
23/11/2015	31.70	0.01	31.70	9/07/2015	20.10	1.00	20.27
9/02/2015	31.50	0.00	31.50	1/04/2015	10.80	0.99	10.97

Table F-70: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R46, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.00	48.00	29/11/2015	25.40	1.94	25.72
26/11/2015	45.10	0.00	45.10	22/11/2015	22.10	1.47	22.34
7/10/2015	38.50	0.00	38.50	13/01/2015	9.10	1.27	9.31
17/10/2015	35.30	0.24	35.34	23/02/2015	10.80	1.27	11.01
14/12/2015	34.70	0.03	34.71	5/11/2015	9.80	1.21	10.00
12/12/2015	34.30	0.10	34.32	3/01/2015	15.70	1.20	15.90
15/12/2015	33.40	1.14	33.59	13/12/2015	26.50	1.17	26.70
20/11/2015	32.90	0.02	32.91	15/12/2015	33.40	1.14	33.59
23/11/2015	31.70	0.00	31.70	14/03/2015	13.80	1.11	13.99
9/02/2015	31.50	0.00	31.50	6/12/2015	15.30	1.06	15.48

Table F-71: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R277, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.00	68.70				
27/11/2015	48.00	0.71	48.12	17/10/2015	35.30	3.42	35.87
26/11/2015	45.10	0.00	45.10	6/01/2015	15.30	1.36	15.53
7/10/2015	38.50	0.00	38.50	15/12/2015	33.40	1.33	33.62
17/10/2015	35.30	3.42	35.87	2/01/2015	26.70	1.12	26.89
14/12/2015	34.70	0.25	34.75	6/12/2015	15.30	1.07	15.48
12/12/2015	34.30	0.70	34.42	10/10/2015	28.80	1.07	28.98
15/12/2015	33.40	1.33	33.62	5/01/2015	25.80	0.97	25.96
20/11/2015	32.92	0.04	32.92	30/12/2015	14.40	0.95	14.56
23/11/2015	31.70	0.39	31.76	4/01/2015	14.20	0.86	14.35
9/02/2015	31.50	0.01	31.50	12/03/2015	25.00	0.78	25.13

Table F-72: Cumulative 24-hour average PM_{10} concentration (µg/m³) – Receptor R319, with contributions from the Next Generation Energy from Waste Facility

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	68.70	0.05	68.71				
27/11/2015	48.00	0.00	48.00	15/02/2015	16.11	1.83	16.41
26/11/2015	45.10	0.00	45.10	19/11/2015	31.00	1.71	31.29
7/10/2015	38.50	0.00	38.50	7/02/2015	17.80	1.13	17.99
17/10/2015	35.30	0.87	35.45	12/09/2015	18.40	1.13	18.59
14/12/2015	34.71	0.88	34.85	5/01/2015	25.80	1.11	25.99
12/12/2015	34.30	0.01	34.30	18/01/2015	24.30	1.10	24.48
15/12/2015	33.40	0.09	33.41	25/01/2015	15.40	1.07	15.58
20/11/2015	32.91	0.03	32.92	31/12/2015	17.70	1.05	17.88
23/11/2015	31.70	0.30	31.75	5/10/2015	20.70	1.00	20.87
9/02/2015	31.50	0.00	31.50	8/02/2015	16.50	0.98	16.67