ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2021

MAYFIELD 4 BERTH

29 MARCH 2022

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Document	Annual Environmental Management Report 2021 Mayfield 4 Berth
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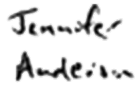
B	29/03/2022	Final for DPE submission	 Jennifer Anderson – Senior Manager Property Environment & Planning

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CONTENTS

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LEVEL 4, 251 WHARF ROAD
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Table of Figures

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1. INTRODUCTION

1.1. General

The following document presents the Annual Environmental Management Report (AEMR) for the 2021 operational year of Mayfield 4 Berth (the site). The report has been prepared by Port of Newcastle (PON) for submission to the Department of Planning and Environment (DPE, or the Department) in accordance with the requirements of the Development Approval (DA, DA-293-08-00). The site is located at Selwyn Street Mayfield NSW.

1.2. AEMR Details

Table 1 presents the details for Port of Newcastle's AEMR.

Table 1: Port of Newcastle's AEMR information

Item	Response
Land in respect of	Land described as the "Closure Area" being Lot 221 DP 1013964, Industrial Drive, Mayfield.
Operator / proponent	Port of Newcastle (Original application made by Broken Hill Proprietary [BHP] Company Limited)
Development consent / Project Approval number(s)	DA-293-08-00
Holder of development consent	Port of Newcastle
Operational year	2021

1.3. Objectives

In accordance with the requirements detailed under Section 9.2 of DA (DA-293-08-00-MOD9) for the site, Port of Newcastle (PON) is required to submit an AEMR for each calendar year to the Director General of DPE and the NSW Environment Protection Authority (EPA). The reporting requirements as set out in the DA include the following:

a) Identify all standards, performance measures and statutory requirements the development is required to comply with;
b) Review the environmental performance of the development to determine whether it is complying with these standards, performance measures and statutory requirements;
c) Identify all occasions during the previous year when these standards, performance measures and statutory requirements have not been complied with;
d) Include a summary of any complaints made about the development and indicate what actions were taken (are being taken) to address these complaints;
e) Include the detailed reporting from the Environmental Monitoring Program (see Condition 8.1), and identify any trends in the monitoring over the life of the project; and
f) Where non-compliance is occurring, describe what actions will be taken to ensure compliance, who will be responsible for carrying out these actions and when these actions will be implemented.

1.4. Background

Operations commenced at Mayfield 4 Berth in January 2010. Mayfield 4 Berth is approximately 1.5 hectares in size, constructed as part of the refurbishment of the former BHP Wharf 5 and is located within an area known as the Closure Area in Mayfield NSW.

The site is a common user berth that is owned by PON under a 98-year lease agreement with the NSW Government, and operated by stevedoring companies under a Stevedore Licence Agreement. The site comprises of a general cargo handling wharf facility that is adjacent to a hardstand area.

In accordance with Condition 9.3 under Schedule 2 of the Consent, the Department requests the following information be included:

> *"Date of approval expiry as of the end of the reporting period, as determined by Schedule 2 condition 1.1A and 1.1B."*
>
> *1.1A - The approval for the General Cargo Handling Facility under MOD-56-7-2008 shall operate for a maximum period of ten years from the date of this modification, or as otherwise agreed to by the Director-General.*
>
> *1.1B - At five yearly intervals following commencement of operation of the General Cargo Handling Facility, the applicant shall submit a report to the Director–General on the need or otherwise for the General Cargo Handling Facility to be retained on site and to remain operational. The report must include supporting justification.*

The approval for the General Cargo Handling Facility (GHF) under DA 293-08-00 MOD9 expires in November 2023. Report '*General Cargo Handling Facility Condition 1.1B Report 2022*' has been provided to DPE in February 2022 to comply with Condition 1.1B of the DA for the development of a Multi-Purpose Terminal (MPT) at the Mayfield Site, covering the period 1 January 2017 to 1 December 2021. For further details regarding the ongoing need for the GHF it is requested to reference the submitted report.

1.5. Update from 2020 AEMR

A summary of actions from the previous year's AEMR is summarised here.

The 2020 AEMR generally identified no non-compliances with the standards, performance measures and statutory requirements for the development with the exception of three PM_{10} 24 hour exceedances and a PM_{10} annual average above the annual criterion.

PM_{10} 24 hour exceedances were similar to elevated levels report by the DPE (formerly DPIE) Lower Hunter Air Quality Monitoring network, suggesting that factors external to M4 operations were likely contributing to elevated readings at this site. PM_{10} Annual Average was similar to the previous year and considered to represent background fine atmospheric particulates in the Newcastle industrial area.

2. SITE IDENTIFICATION AND LOCATION

2.1. Location

The Mayfield 4 Berth is located on the South Arm of the Lower Hunter River approximately 2.5 km north of the city of Newcastle. The site is identified as a portion of Lot 35 DP 1191723, which is labelled as Mayfield No. 4 Berth in Figure 1 and Figure 2. The Mayfield 4 Berth incorporates the berth and adjacent hardstand. The berth is located within the 155-hectare Closure Area of the former BHP Steel Works site constituting approximately 1% of the Area. The site was remediated in accordance with the Voluntary Remediation Agreement for the broader BHP Steel Works Closure Area. The site is located within an existing industrial port area and surrounding land uses include industrial activities and associated infrastructure.

Please also refer to the Site Plan in Appendix A.

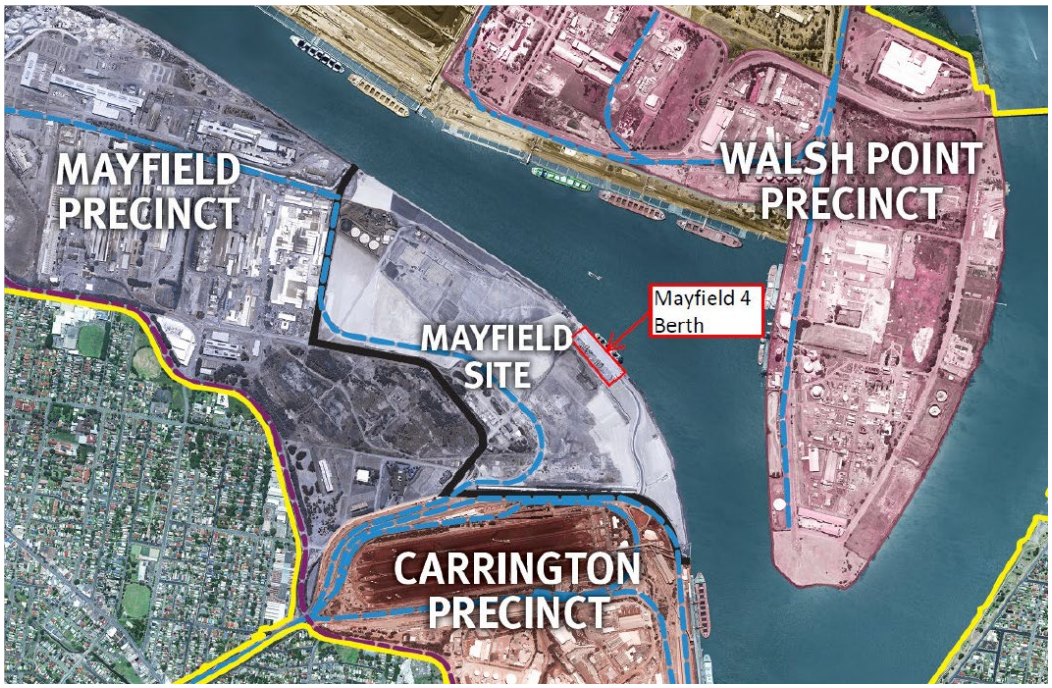


Figure 1: Mayfield 4 Berth Location in relation to surroundings

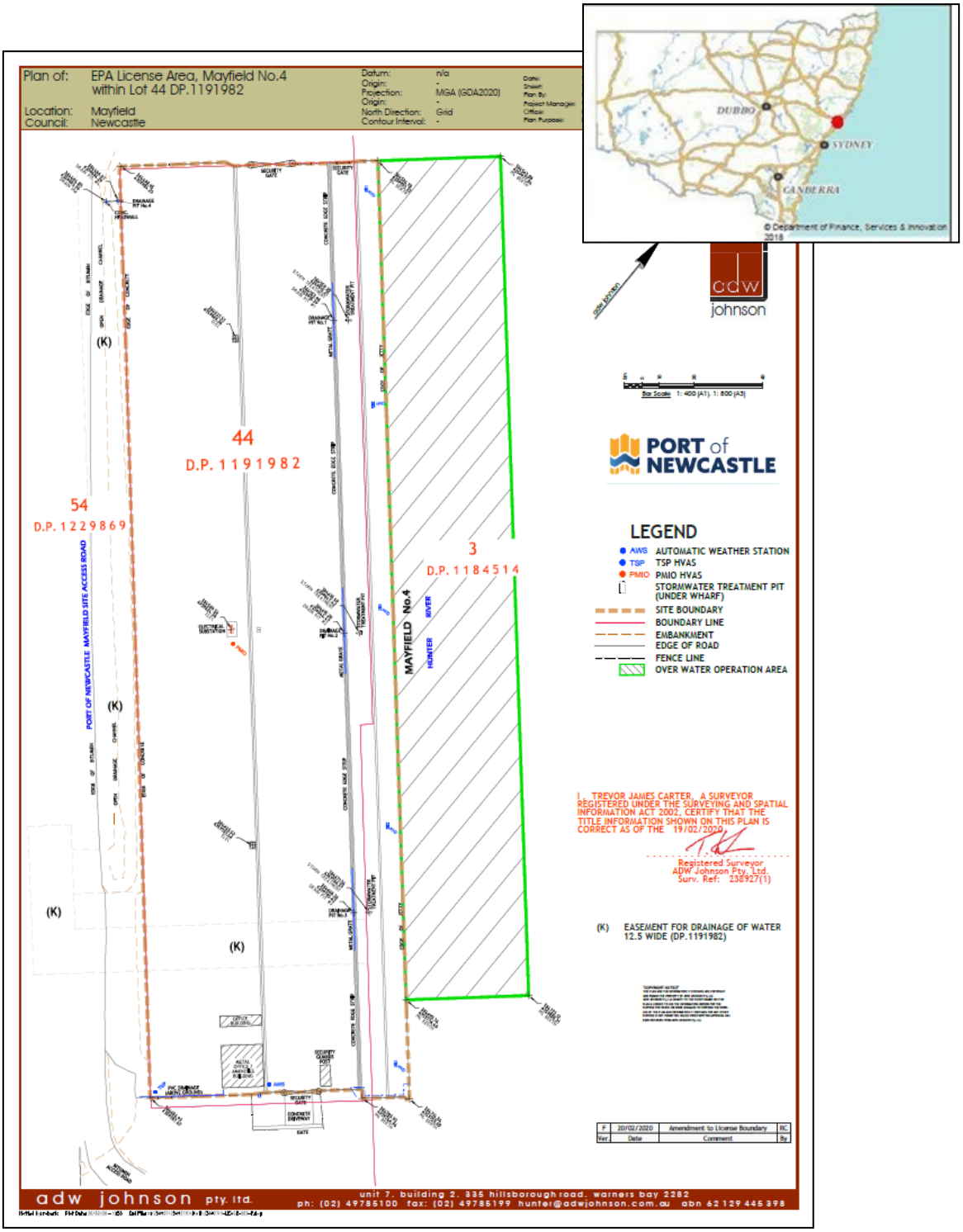


Figure 2: Mayfield 4 Berth schematic

2.2. Operations Overview

Mayfield 4 Berth is a multi-purpose common use berth for bulk shipping operations. DA-293-08-00 applies to '*the remediation of the closure area, removal of structures and the development of a Multi-Purpose Terminal comprising a container terminal and a general cargo handling facility and associated road rail and wharf infrastructure*'. Mayfield 4 Berth (the '*general cargo handling facility*') is the only component of the 'Multi-Purpose Terminal' that has been completed and operations commenced in January 2010. The berth comprises a concrete area, a hardstand covered with bituminous material used for temporary shipping container storage, a site office, security guard hut and amenities. The berth and hardstand have been fully remediated in compliance with the Voluntary Remediation Agreement requirements and is now isolated from the remainder of the site in terms of stormwater and groundwater.

The M4 berth generally operates Monday to Friday during standard business hours, and when ships are in berth M4 can operate 24-hours a day, seven days a week during loading or unloading activities. During loading and unloading activities, mobile equipment such as cranes, forklifts and mobile conveyors are used. Potential cargos for the berth include project cargos (for example wind turbines, transformers, mining equipment and materials), break bulk (inert materials only), general containerized freight, bulk cargoes, and ammonium nitrate in containers or bulker bags.

2.3. Site Infrastructure

The wharf comprises of a concrete area with hardstand covered with bituminous material as shown in the Site Plan in Appendix A. A site office, security guard hut and amenities are located at the southern end of the site. At times, shipping containers may be temporarily stored on the bitumen hardstand area. During loading and unloading activities mobile equipment such as cranes, forklifts and mobile conveyors are used. Operational buildings on the site are limited facilities for stevedoring operations, offices, first aid room, meal room and amenities block located on the eastern end of the hardstand. The employee car parking is located adjacent to the buildings and caters for up to 60 vehicles. A guardhouse building is located at the site entrance.

The adjacent facility operated by Stolthaven is a bulk liquids pipeline that became operational towards the end of 2013, with the first bulk fuel shipment occurring on 19 November 2013. This pipeline is managed under a separate DA and EPL, and therefore does not form part of the AEMR.

2.4. Topography and Drainage

The site is predominantly flat with shallow slopes and contouring to direct and facilitate the collection of stormwater runoff. The stormwater catchment is predominantly limited to rainfall that falls directly on the property. During particularly heavy rainfall, the site can be affected by runoff from the adjacent BHP Closure Area.

The runoff from the wharf area is directed into a central drainage line that channels into three separate collection pits identified as Pits 1, 2 and 3 (EPL 13181 Monitoring Points 4, 5 and 6). At the time of construction, the pits were each fitted with HumeCeptor systems intended to act as separation devices to remove suspended solids and other pollutants from the incoming stormwater. The internal structure of the HumeCeptors was removed in 2013 and the pits retrofitted to improve function. The upgrade involved insertion of a baffle and weir system to slow water flow and increase sediment deposition, as well as filter socks and baskets to capture remaining suspended solids.

To minimise the amount of sediment collecting in the central drain several areas were filled in leaving 50 metres of grated drain either side of each collection point. The grated drain areas have been fitted with filter socks to assist in the removal of TSS prior to entering the collection point.

Pit 4 is located upgradient from operations and does not contain a HumeCeptor. This pit can be influenced by run-on water from the neighbouring land. The locations of the pits are detailed in the site plan EPA Licence Area, Mayfield No 4 located in Appendix A.

2.5. Surrounding Land Uses

The site is located within an industrial precinct with surrounding uses predominantly related to port operations. Development on surrounding properties included large storage buildings, railway yards and tracks, coal loading gantry cranes, stockpiles etc. The port operations of Kooragang Island are located directly across the Hunter River from the site. In this regard the surrounding industrial landscape is highly visually modified and intensively disturbed.

As discussed earlier, the site is within the Mayfield Closure Area that has undergone substantial remediation works in previous years. The site was under the control of the former Hunter Development Corporation (HDC, now Hunter and Central Coast Development Corporation [HCCDC]) for the entire remediation works period. Remediation works were completed for Stage 1 and 2 (approximately 90 hectares) on 24 October 2012 and was followed by a 13-week maintenance period. The former Newcastle Port Corporation (NPC) took possession as owners of the site in February 2013.

A further 10 hectares was transferred to NPC (now PON) under the 98-year lease and is known as the '*Intermodal site*'. The Intermodal site was remediated in full by HDC in 2016, involving installation of capping, land forming and stormwater controls.

Stolthaven received approval from the Department of Planning on 15 December 2016 for Stage 3 of its development. Works include the construction and operation of additional bulk storage and distribution terminal capacity, and a marine loading arm and pipeline. Stolthaven has also completed the construction of Mayfield 7 (M7), a designated bulk liquids berth.

3. STATUTORY REQUIREMENTS

3.1. Requirements applicable to the development

Table 2 presents the approvals, licences and relevant statutory requirements held by PON in relation to the area covered by the DA. PON holds other relevant approvals as necessary for other operational areas which are not applicable to the scope of the AEMR.

Table 2: Relevant approvals, licences and notices

Type and number	Authority / Regulator	Comment / Note
Environmental Protection Licence (EPL) 13181	NSW EPA	Scheduled Activity Shipping in Bulk >100,000 – 500,000 t per year.
Development consent DA-293-08-00	DPE	Please see summary below table.
Major Project Application 09_0096 Mayfield Concept Approval	DPE	Please see summary below table.
Remediation Notice No 20142802	NSW EPA under Section 28 of the Contaminated Land Management Act 1997	Covered by S28 annual review report.

The operation of Mayfield 4 Berth is subject to the conditions of consent issued by the Minister for Urban Affairs and Planning to Broken Hill Proprietary Company Limited on 06 April 2001 (DA293-08-00) for land described as the 'Closure Area' being Lot 221 DP 1013964, Industrial Drive, Mayfield, NSW. PON incurred the responsibilities under the DA upon becoming the owner of the site.

Condition 9.2 of the DA requires PON to submit an AEMR to the Director-General of the Department of Planning and to the EPA 12 months after the commencement of operations at the Mayfield 4 Berth and annually thereafter. It should be noted that while the DA applies to the 100ha parcel of land, the Mayfield 4 Berth only consists of approximately 1.5 hectares within this area.

Since the completion of the remediation works by former HDC (now HCCDC) on 24 October 2012, 90 hectares of remediated land and 10 hectares of unremediated land has been handed over to PON and will be developed under Major Project Application 09_0096, the Concept Approval endorsed by the Minister for Planning and Infrastructure on 16.07.12. As per Section 1.6 of the Concept Plan it does not apply to berths, berthing or harbour operations. It also does not apply to activities approved or legally operating at the site in accordance with other project approvals at the date of the Concept Plan Approval.

3.2. Roles and responsibilities

The Environmental Manager is the key person responsible for the facilitation of the following items as per Condition 9.1 of the DA:

- preparation of the OEMP;
- considering and advising on matters specified in the conditions of the consent and advising on compliance with such matters;
- responsible for receiving and responding to complaints;
- facilitate an induction and training program for all persons involved with site preparation and construction activities; and
- advise the Site Manager to require reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts and failing the effectiveness of such steps, to stop work immediately if an adverse impact on the environment is likely to occur.

The Site Manager reports to the Environmental Manager regarding berth operations.

The berth is owned by PON under a 98-year lease and is operated by stevedoring companies under a Stevedore Licence Agreement with PON. Stevedores working under the berth report to the Site Manager and PON Wharf Officer(s) regarding operations.

4. MONITORING REQUIREMENTS

Monitoring requirements of the DA and EPL 13181 that apply to the Mayfield 4 Berth area during operation are summarised in the following report sections and include:

- Air quality monitoring (Conditions 8.9 and 8.10);
- Noise monitoring (Condition 5.11);
- Groundwater monitoring (Condition 8.14); and
- Surface water monitoring (Condition 8.16).

5. REVIEW OF AIR QUALITY MONITORING AND MANAGEMENT

5.1. Assessment Criteria

The assessment criteria applicable in NSW for the assessment of Particulate Matter <10 micrometres in diameter (PM_{10}) and Total Suspended Particles (TSP) in ambient air are described in Table 1 Schedule 2 of the *National Environmental Protection (Ambient Air Quality) Measure*. The relevant assessment criteria are provided in Table 3.

Table 3: Air Quality Monitoring Requirements

Analyte	Averaging Period	Criteria	Units
Particulate Matter (<10 micrometres in diameter; PM_{10})	24 hours	50	µg/m³
	Annual	25	µg/m³
Total Suspended Particles (TSP)	N/A	N/A	N/A

Conditions 3A and 3D of Section 18 of the National *Environmental Protection (Ambient Air Quality) Measure* identifies that for the purpose of reporting compliance against PM_{10} for 1 day and 1 year average standards, all measured data should be included, including monitoring data that is directly associated with an exceptional event. For the 1 day average standard an exceptional event (as per the definition below) shall be identified and described.

> ***Exceptional event*** *means a fire or dust occurrence that adversely affects air quality at a particular location and causes an exceedance of 1 day average standards in excess of normal historical fluctuations and background levels, and is directly related to: bushfire; jurisdiction authorized hazard reduction burning; or continental scale windblown dust.*

It should be noted that in October 2016 as part of a licence variation for 13181, EPA removed the condition to monitor air quality at the site. The removal of this condition was based on the low-risk nature of the site and PON's contribution to the establishment and ongoing running costs of the EPA's Lower Hunter Air Quality monitoring network. For due diligence PON continues to monitor air quality and provides a comprehensive summary as part of the AEMR.

5.2. Sampling methodology and frequency

A High-Volume Air Sampler (HVAS) for PM_{10} and TSP were operated in accordance with the following required methods:

- PM_{10} - AS/NZS3580.9.6:2003: *Methods for sampling and analysis of ambient air – method 9.6: Determination of suspended particulate matter – PM_{10} Total high-volume sampler with size selective inlet - gravimetric method.*
- TSP - AS/NZS3580.9.3:2003: *Methods for sampling and analysis of ambient air – method 9.3: Determination of suspended particulate matter – Total Suspended Particulate Matter (TSP) - gravimetric method.*

The HVASs were operated in accordance with the required six (6) day run schedule. A total of 61 samples out of a possible 70 samples were collected during the period. Assessment criteria was shown previously in Table 3.

5.3. Quality Assurance and Quality Control

The PM_{10} unit was installed in accordance with the general guidelines provided in AS/NZS3580.1.1:2007, however due to site restrictions caused by constant heavy vehicle traffic and the need for safety of the field staff and equipment, the HVAS was re-installed approximately 600mm from a permanent structure and inside a metal guard rail. As such the selected location does not meet the following general guidelines in the standard:

- Minimum 1 m distance to a wall or supporting structure
- 120° clear sky angle

The clear sky angle guideline is met for approximately 300 degrees surrounding the unit facing the berth, with only a minor portion or the angle obstructed as the part obstructed faces away from the berth. All other general guidelines are met. Due to the previously stated restrictions the selected location is considered appropriate for the monitoring equipment.

The TSP unit was installed in accordance with the guidelines provided in AS/NZS3580.1.1:2007 *Methods for sampling and analysis of ambient air – Part 1.1: Guide to siting air monitoring equipment.*

5.4. Results of air monitoring

5.4.1. PM_{10}

The rolling annual average for PM_{10} and the 24-hour average results along with relevant limits are shown graphically in Figure 3. The contracted laboratory analytical reports, field sheets and laboratory analysis certificates are retained by PON and are available upon request. A summary of historic air quality results is contained in Appendix E.

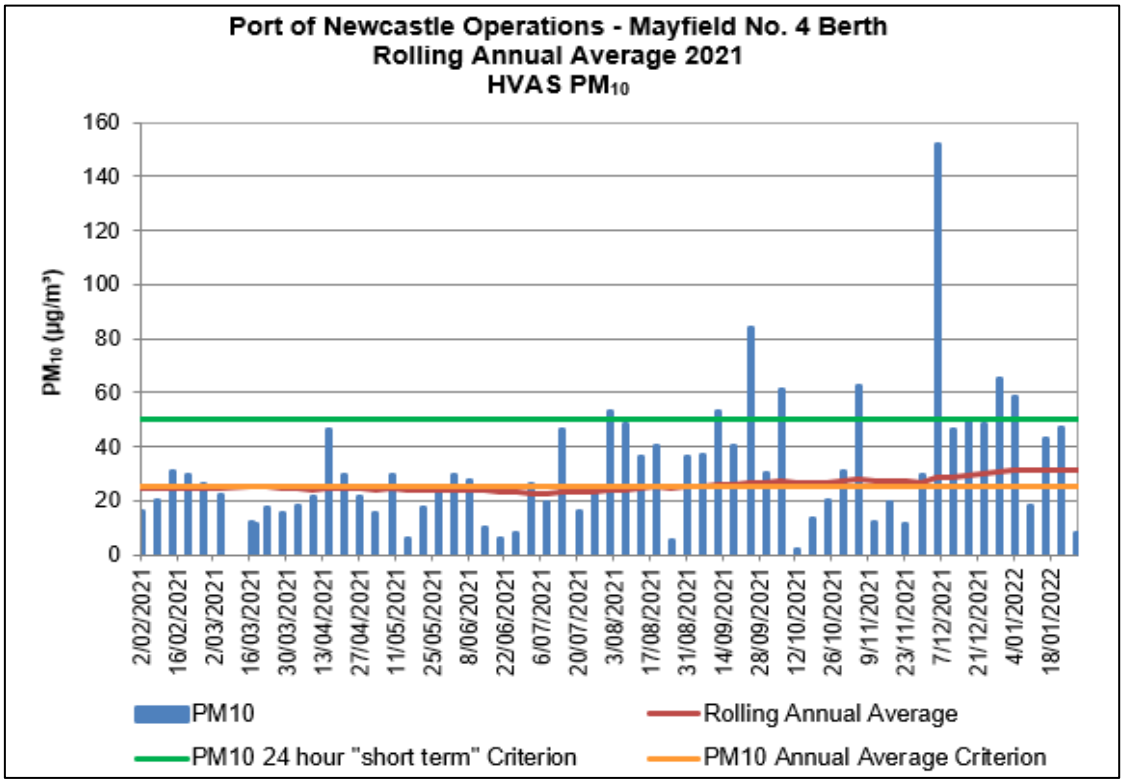


Figure 3: Rolling Annual Average (2 Feb 2021 – 27 Jan 2022) HVAS PM_{10}

It can be seen from the results in Figure 3 that during the 12 months to January 2022 the PM_{10} annual rolling average appeared to remain stable over the year, however with a reduction noted in January 2022. The consistently stable pattern has been observed since the commencement of monitoring at the site.

As an example, the historical annual averages from 2009 to date are presented in Figure 4 and is considered to represent the background fine particulate component of total suspended particulates in the Newcastle industrial area. There is a general trend of a reduction in the rolling annual average over the six years that monitoring has been conducted at the site.

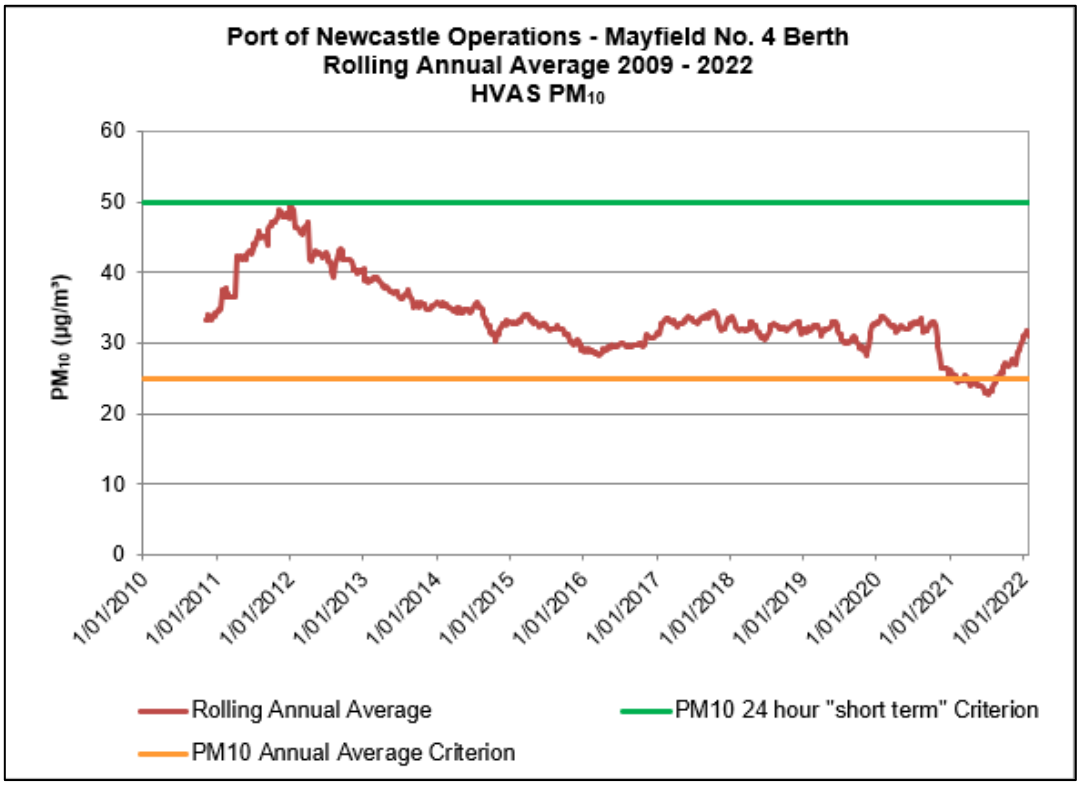


Figure 4: Rolling Annual Average 2009 to date HVAS PM_{10}

There were seven (7) occurrences of the 24-hour PM_{10} exceeding the criterion of 50 µg/m^3 during the reporting period which ranged from 53 µg/m^3 to 152 µg/m^3. Individual events that exceeded the 24hr criterion are presented in Table 4.

Table 4: PM_{10} HVAS 24hr Exceedances 2021 - 2022

Date	Conc. 24-h (µg/m³)	Rainfall (mm)	Predominant Wind Direction	Wind Speed Avg (m/s)	Vessel operating	Vessel type
01/08/2021	53	1.0	North West	4.8	Yes	Iron and steel products
12/09/2021	53	0	North West	4.7	Yes	Ammonia Nitrate

Date	Conc. 24-h (µg/m³)	Rainfall (mm)	Predominant Wind Direction	Wind Speed Avg (m/s)	Vessel operating	Vessel type
24/09/2021	84	0	West North West	6.2	Yes	Iron and steel products
05/11/2021	62	0	West North West	6.1	No	NA
05/12/2021	152	0.2	East South East	7.1	Yes	Iron and steel products
29/12/2021	65	1.2	East South East	4.1	Yes	Industrial machinery equipment
4/01/2022	58	0	South South East	9.3	No	NA

All exceedances with the exception of concentrations reported on 5 November 2021 and 4 January 2022 coincided with the berth being operational. However, no exceedances coincided with PON's licensed activity of 'shipping in bulk' at M4 on the day of the exceedances. A complete list of vessel movements at Mayfield No. 4 Berth for 2021 is provided in Appendix D.

In order to provide a comparison to PON data at the time of the exceedances, the air quality data published by DPE for the Lower Hunter and Newcastle sites was referenced using the Data Download facility. The dates where the PON site experienced exceedances as shown in Table 4 were searched at locations near to the Mayfield site for the daily (24 hour) average PM_{10} concentrations and are presented in Table 5, and supporting data is provided in Appendix F.

Table 5: DPE Air Quality Monitoring Network Results PM_{10}

	PM 10 Conc. 24-h average (µg/m³) for identified sites					
Date*	Wallsend	Carrington	Stockton	Newcastle	Mayfield	Beresfield
01/08/2021	19.8	29.4	38.3	23.8	24.1	21.4
12/09/2021	23.9	38.1	56.1	28.1	28.5	26.9
24/09/2021	17.6	29.4	43.6	22.0	22.9	24.2
05/11/2021	9.5	19.4	46.1	17.0	22.5	7.7
05/12/2021	18.3	22.0	34.0	25.4	22.5	19.6
29/12/2021	-	13.4	20.5	11.4	10.9	10.7
04/01/2022	15.5	20.2	52.6	34.2	20.8	18.2

* Obtained from DPE's data available at https://www.dpie.nsw.gov.au/air-quality/air-quality-data-services/data-download-facility

Evaluation of the M4 berth elevated average concentrations for PM_{10} in Table 4 against the DPE data within the Lower Hunter Air Quality network identifies comparable elevated readings on 1 August, 12 September, 5 November 2021 and 4 January 2022 especially in the Stockton area. The comparison for these dates appears to indicate that factors external to M4 operations were likely contributing to the elevated readings at the measurement site on these dates.

Elevated PM_{10} concentrations remained for dates of 24 September, 5 December and 29 December 2021 which exceeded the criterion of 50 µg/m^3. Wind direction was East South East (5 and 29 December 2021) to West North West (24 September 2021) respectively. The concentrations measured on these dates are not consistent with DPE's Lower Hunter Air Quality Monitoring Network data, suggesting that sources were closer to the site. During the monitoring events it was noted that the cargo itself was unlikely to have contributed to the particulate concentrations on the berth, unless breakages occurred. The ambient dust concentrations may have been associated with vehicle and machinery movements onsite, including heavy vehicles and forklifts. The sampling team noted that while no visible dust was observed, patches of dirt were evident in some locations on the bitumen surface where movement was occurring. A number of measures are already undertaken at the site as a method of best practice and will be continued, including environmental inspections, twenty-four-hour anemometer monitoring and shift inspections of each ship in port.

To complement the above information, DPE publishes *Air Quality Monitoring Network* newsletters each quarter available at https://www.environment.nsw.gov.au/topics/air/monitoring-air-quality/lower-hunter-and-central-coast/lower-hunter-and-central-coast-air-quality-reports.

The DPE's air quality monitoring newsletters were referenced for Winter 2021, as no additional reports were available for the year at the time of writing the report. The information provided is summarised as follows:

- Levels of nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and ammonia (NH_3) were good, all remaining below national benchmark concentrations and assessment goals.
- Daily average levels of fine particulate matter $PM_{2.5}$ (particles less than or equal to 2.5 microns in diameter) remained below the national benchmark of 25 micrograms per cubic metre (µg/m^3).
- Daily average levels of particulate matter PM_{10} (particles less than or equal to 10 microns in diameter) were above the 50 µg/m^3 national benchmark on 2 days (2 June and 9 August 2021), both occurring at Stockton. Regional maximum daily PM_{10} levels on these days ranged from 53.7 to 60.2 µg/m^3.
- At Stockton, elevated hourly PM_{10} levels (> 75 µg/m^3) predominantly occurred under onshore north-easterly to south-easterly winds (67% of the time that levels were elevated). The events on 2 June and 9 August 2021 were likely due to sea salt with light winds coming onshore from the northeast on both occasions.
- Stockton recorded the regional daily PM_{10} maximum concentration on 86% of winter days in 2021.

It therefore appears that elevated PM_{10} levels experienced in the greater region were also influenced by fire activity, sea spray and light winds and significant weather events. The available newsletter reports are provided in Appendix F.

5.4.2. Total Suspended Particulates (TSP)

The rolling annual average for TSP and the 24-hour average results along with relevant limits are shown graphically in Figure 5. The contracted laboratory analytical reports, field sheets and laboratory analysis certificates are retained by PON and are available upon request. A summary of historic air quality results is contained in Appendix E.

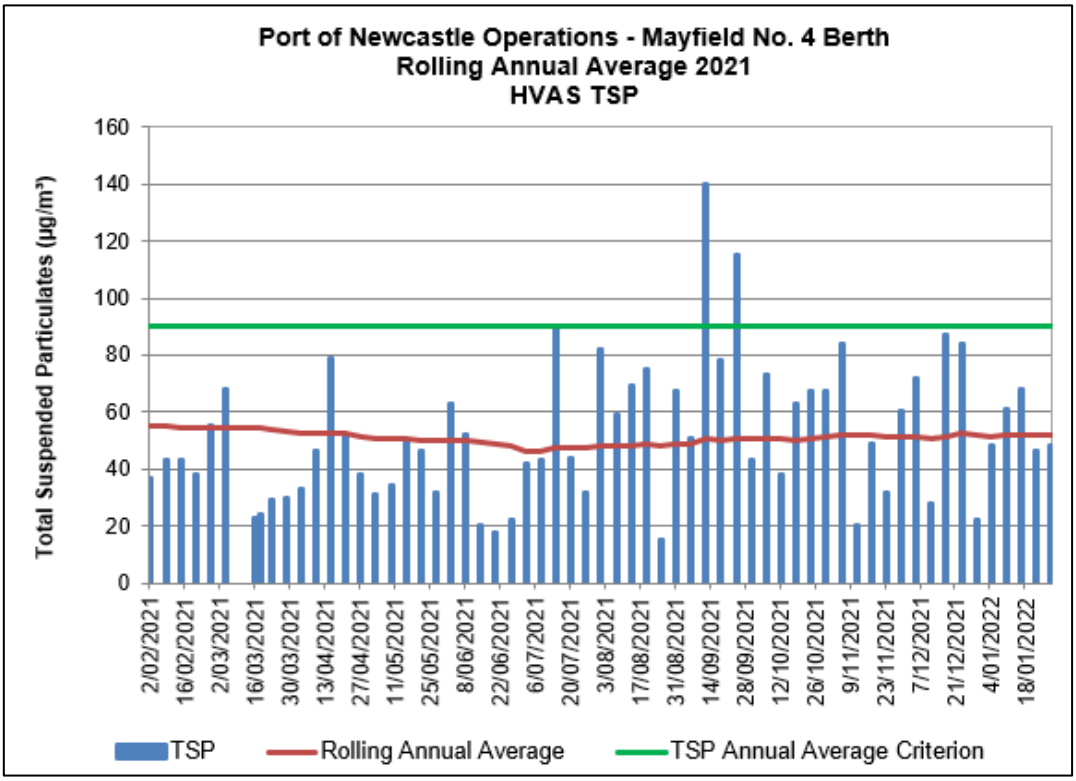


Figure 5: Rolling Annual Average HVAS TSP

During the 12 months to 27 January 2021 the TSP annual rolling average is shown to be generally below the annual average criterion of 90 µg/m^3.

For purposes of discussion, there were two (2) notable elevated results during the reporting period Individual events that exceeded the 24hr criterion of are presented in Table 6. The results are described as 'elevations' as the measurements were performed over 24 hours, and the TSP criterion available is over the annual period.

Table 6: TSP HVAS Elevations 2021

Date	Conc. 24-h (µg/m^3)	Rainfall (mm)	Predominant Wind Direction	Wind Speed Avg (m/s)	Vessel operating	Vessel type
12/09/2021	140	0.0	North West	3.5	Yes	Ammonia Nitrate
24/09/2021	115	0.5	West North West	6.1	Yes	Iron and Steel Products

The two (2) elevations coincide with the berth being operational, however, none coincided with PON's licensed activity of 'shipping in bulk' with a berth at M4 on the day of the exceedance.

The elevations for September 2021 coincide with the date of exceedances for PM_{10}. As explained in Section 5.4.1, the concentrations measured on these dates are not consistent with DPE's Lower Hunter Air Quality Monitoring Network data. During the monitoring events it was noted that the cargo itself was unlikely to have contributed to the particulate concentrations on the berth, unless breakages occurred.

The ambient dust concentrations are more likely to have been associated with vehicle and machinery movements onsite, including heavy vehicles and forklifts. The sampling team noted that while no visible dust was observed, patches of dirt were evident in some locations on the bitumen surface where movement was occurring. A number of measures are already undertaken at the site as a method of best practice and will be continued, including environmental inspections, twenty-four-hour anemometer monitoring and shift inspections of each ship in port.

6. REVIEW OF ENVIRONMENTAL NOISE MONITORING & MANAGEMENT

6.1. Assessment Criteria

The recommended noise management levels for each of the identified receivers is provided in condition 5.11 of the Development Application DA 293-08-00, dated 23 August 2013 (MOD-9), Condition 5.11 of the Consent Condition requires that the facility demonstrates compliance with site noise limits at various noise sensitive receivers near the facility. It is not possible to directly measure the impact of noise arising from operations at Mayfield No. 4 Berth due to the influence from extraneous noise sources at nearby receiver locations. The compliance assessment was therefore carried out using SoundPLAN noise modelling software. This method of noise compliance assessment is in accordance with Chapter 11 of the NSW Environment Protection Authority's (EPA) *Industrial Noise Policy*.

Condition 5.11 of the DA outlines that noise generated by the facility's operations shall not exceed the noise impact assessment criteria specified in Table 7 for the indicated locations and periods.

Table 7: Noise monitoring locations and criteria

Location	Day [1] $L_{Aeq(15\ minute)}$ dB(A)	Evening [2] $L_{Aeq(15\ minute)}$ dB(A)	Night [3] $L_{Aeq(15\ minute)}$ dB(A)
1. 52 Arthur Street	49	38	38
2. Mayfield East Public School	47	37	37
3. 21 Crebert Street	49	39	39
4. Newcastle TAFE	44	38	38
5. 1 Arthur Street	48	33	33

[1] Day: 7:00am to 6:00pm Monday to Saturday; 8:00am to 6:00pm Sundays and public holidays
[2] Evening: 6:00pm to 10:00pm on any day
[3] Night: 10:00pm to 7:00am Monday to Saturday; 10:00pm to 8:00am Sundays and public holidays

In accordance with Section 11.1.2 (Notes on Noise Monitoring) of the *Industrial Noise Policy* onsite measurements were taken at individual plant items and typical operations at the berth. The plant item sound power levels were determined by attended noise measurements made on site. Based upon the attended measurements, 'reasonable' worst case operational scenarios were established and modelled for the operations during the day, evening and night assessment periods as per the requirements of Condition 5.11. In total three operational scenarios were modelled. The assessment of each scenario considers a 'reasonable' worst case 15-minute operational period. These scenarios are:

- Containers being loaded from ship onto the wharf
- Unloading Ammonium Nitrate Bags from the site
- Container being loaded/unloaded from trucks prior to and after ship arrival/departure (assumes worst case when ship is at the berth, but no ship-based operations occurring)

Previous operational noise compliance assessments undertaken by AECOM have confirmed consistent compliance from these berth operations over these three years, which were presented in the following assessments:

1) Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60223483.RPT02.01, dated 7 October 2011.

2) Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60223483.RPT03.02, dated 21 December 2012.

3) Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60223483.RPT04.01, dated 17 September 2013.

No changes in these operations have taken place during 2021 and so the noise impacts are expected to be the same, and thus comply with the site noise limit requirements.

New bulk fuel operations commenced at Mayfield No. 4 Berth in November 2013. Even though consistent compliance has been demonstrated over several years for the other berth operations, the noise impacts from the new bulk fuel operations require assessment and demonstration of consistency in the noise emissions from the new bulk fuel operations.

Eight previous operational noise compliance assessments have been undertaken by AECOM for the bulk fuel operations, which are presented in the following assessment:

1) Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60333368-RPNV-01_C, dated 24 November 2014.
2) Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60343794-RPNV-02_B, dated 1 November 2015.
3) Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60518192-RPNV-02_B, dated 5 December 2016.
4) Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 605533182-RPNV-02_B, dated 18 December 2017.
5) Mayfield No.4 Berth, Operational Noise Compliance Assessment (2018), 60553318-RPNV-03_B, dated 15 February 2019.
6) Mayfield No.4 Berth, Operational Noise Compliance Assessment (2019), 60620229-RPNV-01_0, dated 19 December 2019.
7) Mayfield No.4 Berth, Operational Noise Compliance Assessment (2020), 60620229-RPNV-06_0, dated 02 March 2021.
8) Mayfield No.4 Berth, Operational Noise Compliance Assessment (2021), 60620229-RPNV-08_0, dated 17 January 2022.

6.2. Environmental Noise Monitoring Results

PON submitted a report for annual noise compliance monitoring to the Department in a submission dated 10 February 2022. Please refer to Appendix G for a copy of this report and detailed description of monitoring methodology and results.

In summary, the day, evening and night-time noise emissions were predicted at each of the required assessment locations and compared against the site noise limits. In accordance with the requirements of Condition 5.11 all scenarios were modelled using a Pasquill stability class of D for the day period and a Pasquill stability class of F for the evening and night periods, and a worst-case source to receiver wind of 3 m/s for the day, evening and night periods was incorporated into the modelling.

The results of the modelling concluded that full compliance was achieved at the five required assessment locations during all assessment periods.

7. REVIEW OF GROUNDWATER MONITORING & MANAGEMENT

7.1. Assessment Criteria

Conditions 8.14 and 8.15 of DA 293-08-00 state:

> *"A number of Groundwater bores from the existing network must be retained and maintained on the site"*; and
>
> "*The applicant must submit a list of proposed parameters to monitor groundwater contaminants to the EPA for approval prior to any cut and fill operations commencing on the site.*"

PON maintain and monitor the groundwater bores every six (6) months which includes a review of data quality, comparison of groundwater levels with previous levels, and identification of any significant changes in hydrology. Groundwater monitoring well locations are shown in Figure 6.

Figure 6: Groundwater bore locations

The groundwater level data has been monitored and assessed since 12 July 2013. The work performed includes:

- Download of existing groundwater loggers (and barometric pressure);
- Manual measurement of groundwater levels during each download;
- Level logger data processing (manipulation and conversions); and
- Compilation of groundwater level report.

7.2. Methodology and Quality Assurance

Data loggers from a total of six (6) groundwater wells comprising three (3) fill wells (MW13-12F, MW05Fa and M14-21F) and three (3) shallow estuarine wells (MW13-12S, MW05Sa and M14-21S) were retrieved for download during the site visit on 28 January 2021. The standing water level was measured with a water level dip meter immediately after the removal of the groundwater loggers at each well.

The groundwater level loggers are downloaded on a quarterly frequency and in the previous twelve (12) months the loggers were downloaded on 21 April 2021, 4 August 2021, 13 October 2021 and 28 January 2022.

7.3. Groundwater Monitoring Results for Fill Monitoring Wells

The following observations of the groundwater level within the fill monitoring wells in the previous twelve months from 1 January 2021 to 28 January 2022 concluded that:

- M13-12F: a stable trend during January – March 2021, followed by increased variability of groundwater levels was observed between March – August 2021. A slight decreasing trend was observed between September – November 2021.
- Due to a battery malfunction, data 1 to 28 January 2021 was not considered valid.
- A decrease in the water level data was noted commencing November 2021 until water level data returned to historical levels by 19 December 2021. It was unknown if the event was representative of a data logging failure, field conditions or an interruption to the data logging.
- There is no data available for the period December 2021 – January 2022, due to failure of the logger. The logger has since been removed and replaced with the contractor for upcoming monitoring events.

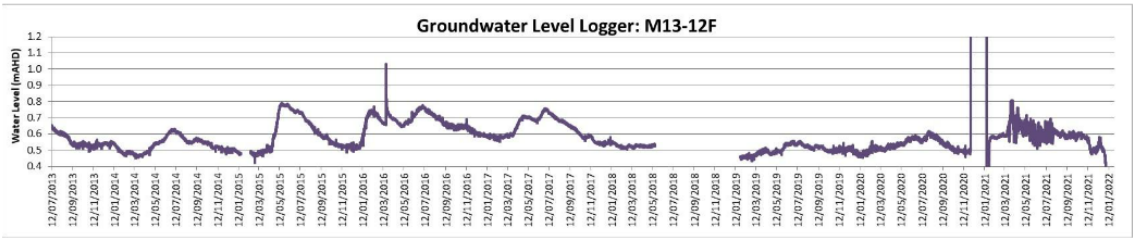


Figure 7: Groundwater Level Logger M13-12F 2013 to date

- MW05Fa: a generally stable trend during January – March 2021, followed by increased variability between March – August 2021. The trend then shows to be decreasing during the period September – November 2021 before stabilising between December 2021 – January 2022.

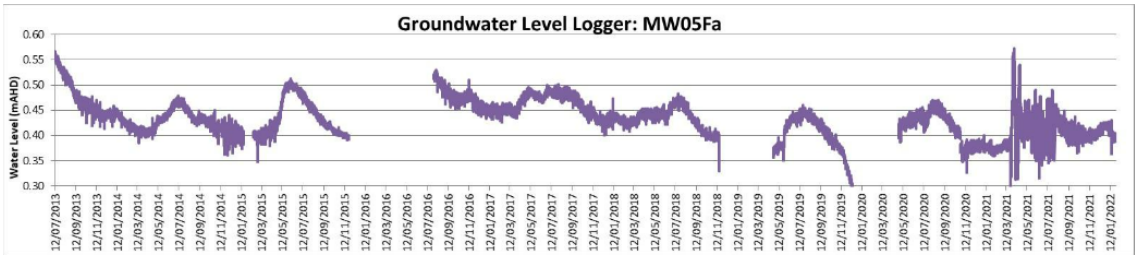


Figure 8: Groundwater Level Logger MW05Fa 2013 to date

- M14-21F: displayed an increasing trend between January – March 2021. The location displayed significant variability between March and August 2021, before overall remaining generally stable between September 2021 – January 2022.

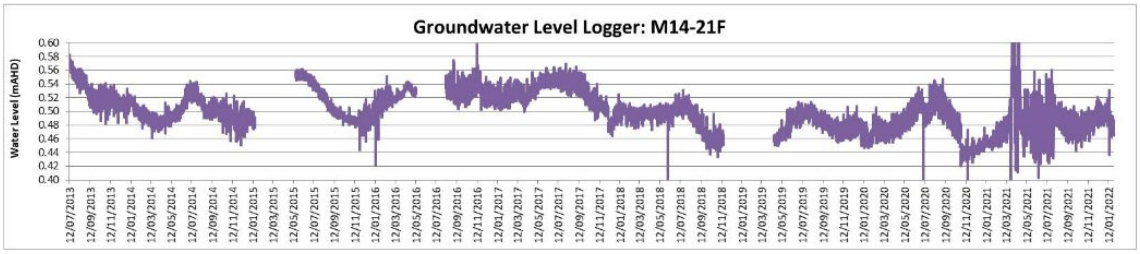


Figure 9: Groundwater Level Logger M14-21F 2013 to date

Long term trends appear to indicate the water level within these three (3) wells are generally stable, however there was an increase in variability between March and August 2021. Following August 2021, data was generally consistent with historical ranges. There was no substantial change in groundwater levels as a response to rainfall events, however, a slight increase/decrease in water level has been observed during periods of sustained decreased rainfall or sustained increased rainfall.

7.4. Groundwater Monitoring Results for Shallow Estuarine Monitoring Wells

The groundwater levels recorded within the shallow estuarine monitoring wells M13-12S, M05FSa and M14-21S show considerable daily fluctuations which are likely due to the impact of tides from the Hunter River.

The following observations of the groundwater level within the shallow estuarine monitoring wells in the previous twelve months (1 January 2021 – 28 January 2022):

- M13-12S: Water level shows an overall stable trend.
-

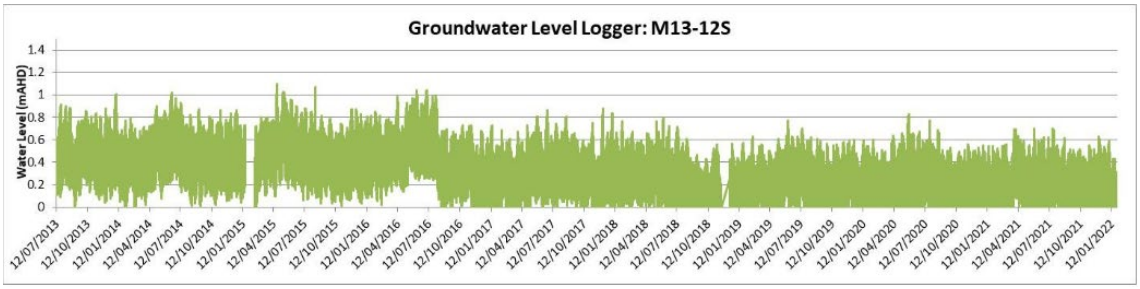


Figure 10: Groundwater Level Logger M13-12S 2013 to date

- MW05Sa: Water level shows an overall stable trend.

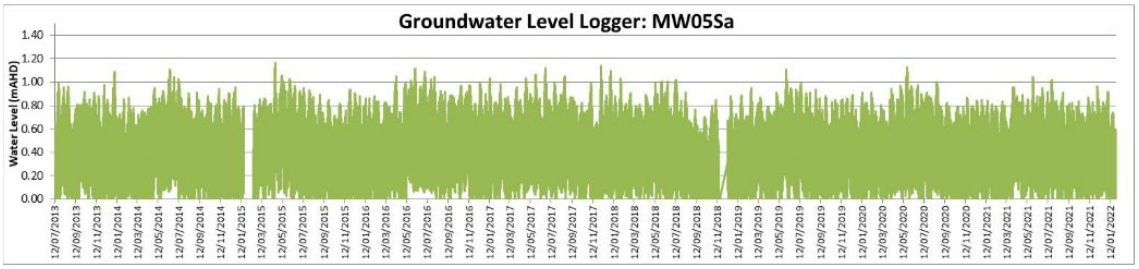


Figure 11: Groundwater Level Logger MW05Sa 2013 to date

- M14-21S: Water level shows an overall stable trend.

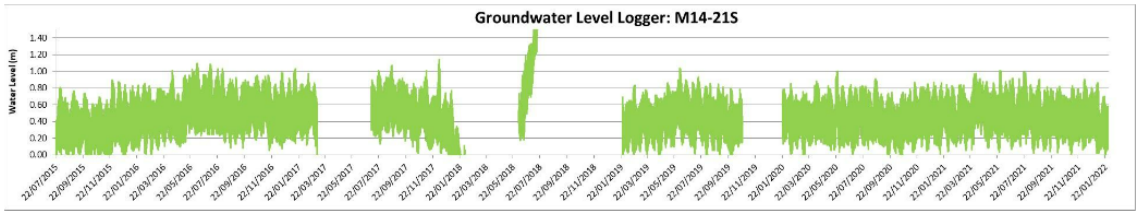


Figure 12: Groundwater Level Logger M14-21S 2013 to date

Therefore, the fill and shallow estuarine aquifers are generally observed to exhibit a minimal response to rainfall events, whilst the shallow estuarine water levels exhibit tidal responses.

8. REVIEW OF SURFACE WATER QUALITY MONITORING AND MANAGEMENT

8.1. Assessment Criteria

Condition 8.16 of DA-293-08-00 specifies that Stormwater from the discharge point of the stormwater detention basin(s) or from stormwater collected in the basin(s) where no discharge is occurring must be monitored in accordance with the criteria sent out in the conditions unless otherwise directed or approved by the EPA.

PON operate Mayfield 4 Berth under Environment Protection Licence (EPL) 13181 issued initally by the EPA on 4 November 2009, which is provided in Appendix B.

In November 2016 EPL 13181 was varied in order to remove monitoring point 9 (pit 4) due to the location not impacted by the handling of loose bulk cargo, and amendment of the frequency of stormwater quality monitoring required from 'monthly during discharge' to being undertaken during '*the first discharge event following a loose bulk cargo operation*'. EPL 13181 was most recently modified 4 August 2020.

Surface water monitoring is conducted in accordance with the criteria stipulated in condition L2 of the EPL and set out in Table 8.

Table 8: EPL 13181 Monitoring Points 4, 5, and 6 Stormwater Quality Monitoring Requirements

Pollutant	Units	Frequency	100%ile Conc. Limit
Nitrogen (Total)	mg/L	The first discharge event following a loose bulk cargo operation	10
Oil and Grease	mg/L	The first discharge event following a loose bulk cargo operation	10
pH	pH	The first discharge event following a loose bulk cargo operation	6.5 – 8.5
Total Suspended Solids	mg/L	The first discharge event following a loose bulk cargo operation	50

8.2. Review of stormwater monitoring results

As no loose bulk cargo was handled during the AEMR period, no surface water monitoring was required to be undertaken and therefore no results are presented.

9. INDEPENDENT ENVIRONMENTAL AUDIT 2020

The Independent Environment Audit (IEA) is a statutory requirement by the Department under Conditions 9.4 and 9.5 of DA-293-08-00. In accordance with Condition 9.4, an Independent Environmental Audit is required to be undertaken within 12 months of commissioning the Multi-Purpose Terminal and every three years thereafter. The previous IEA period ended on 27 August 2017. The audit period covered by the Audit is from 28 August 2017 to 4 November 2020 and the IEA was provided to the Department via the client portal in January 2021.

The IEA assessed the development to be generally compliant with the conditions of Development Consent DA-293-08-00. Five (5) non-compliance issues were identified relating to five conditions, which were considered to be of an administrative nature:

- Condition 3.1 - Minor non-compliances with DA 293-08-00 were identified.
- Condition 7.4 - Prior to 2018, no dangerous goods register for the facility was used. This non-compliance includes from August 2017 which is part of the audit period. A dangerous goods register is included as Appendix H to the 2018 and 2019 Annual Environmental Management Reports (AEMRs). The dangerous goods register did not include:
    - details on the time of arrival/dispatch of all dangerous goods to the site
    - quantities of dangerous goods
    - packaging specifications and UN number.
- Condition 9.1 - A formal notification of the name and contact details of the current Environmental Officer was not provided to the Department following change of personnel. The non-compliance was rectified following review of the Draft Audit report by PON with a letter to the Department.
- Condition 9.2 - There is no evidence that the AEMRs have been submitted to the EPA for the audit period. This was completed following review of the Draft Audit report by PON with immediate submission to EPA.
- Condition 9.3 - An update on the previous Independent Environmental Audit was not provided in the 2019 AEMR. PON committed to providing the information in upcoming AEMRs as has been performed in this report.

The IEA report also included a number of recommendations and observations. Upon submission to the Department PON provided an Action Plan with the IEA report, shown in Table 9.

Table 9: IEA Action Plan provided to DPE with IEA 2020 report

Condition	Description	PON 2020 proposed timeline
3.1	Minor non-compliances identified as detailed in report.	Ongoing for future reports
7.4	Dangerous goods register to be revised to ensure inclusion of necessary details.	July 2021
9.3	Update on previous IEA to be included in AEMRs going forward.	March 2021

Following submission of the IEA report, the Department responded with a Request for Further Information (RFI) in February 2021. The RFI asked for the following information:

> *"…provide a response to the audit* 'Opportunities for Improvement', *including a timeline for implementation."*

PON provided a response letter which included an implementation plan table for the open non-compliances and updated to include the 'Opportunities for Improvement', noting that the non-conformances were previously submitted with the IEA report. In the RFI response letter PON reiterated that the remaining audit non-conformances were rectified and these were noted in the IEA report. The table was updated to include the 'Opportunities for Improvement' as provided in the IEA.

Table 10 shows the implementation plan provided to DPE in February 2021, and the table includes the updated status of each action at the time of writing. It can be seen that all items relating to the 2020 IEA are considered closed.

Table 10: RFI Implementation Plan provided to DPE February 2021 and updated status March 2022

Condition	Item provided in IEA	PON comments and proposed timeline	PON actions	Status
Non-conformances				
3.1	*Minor non-compliances identified as detailed in report.*	Ongoing for future reports	Completed as described in 2020 AEMR.	Closed 2020
7.4	*Dangerous goods register to be revised to ensure inclusion of necessary details.*	Completion by 31 July 2021	Completed and accepted by DPE on 9 August 2021 through Planning Portal.	Closed 2021
9.3	*Update on previous IEA to be included in AEMRs going forward.*	Completion by March 2021	Completed and included in 2020 AEMR onwards.	Closed 2020
Opportunities for Improvement				
4.4	*The next update of the OEMP should include a review of references to ensure they are correct.*	OEMP underwent review in September 2021 and was submitted to DPE on 29 September 2021.	Completed and accepted by DPE on 28 October 2021 through Planning Portal.	Closed 2021
4.4	*Update Section 4.5 of the OEMP with the correct web*	OEMP underwent review in September 2021 and	Completed and accepted by DPE on 28 October	Closed 2021

Condition	Item provided in IEA	PON comments and proposed timeline	PON actions	Status
	address for complaints handling.	was submitted to DPE on 29 September 2021.	2021 through Planning Portal.	
8.9	*Testing of the TSP should be completed at regular intervals in accordance with AS/3760. A schedule should be maintained on a site database to ensure future testing dates are met.*	Reports are provided monthly from contractor as specified in the report. As of December 2020 a *PON Environmental Compliance Calendar* has been developed and is implemented for use.	Completed and in use.	Closed 2020
8.14	*Include a discussion on the groundwater monitoring in the AEMRs.*	Completion by March 2021.	Completed and included in 2020 AEMR onwards.	Closed 2020

10. INDEPENDENT HAZARD AUDIT 2020

Condition 7.11 of the DA requires that an independent hazard audit is to be undertaken twelve (12) months after the commencement of operations and every three (3) years thereafter.

The Hazard Audit was performed in accordance with the *Hazardous Industry Planning Advisory Paper No.5,* '*Hazard Audit Guidelines*' in November and December 2020, and finalised in February 2021. Following completion the hazard audit report was submitted to DPE through the client portal.

The previous audit period ended on 27 August 2017. The audit period covered by the Audit is from 28 August 2017 to 4 November 2020 and the IEA was provided to the Department via the client portal in January 2021.

The audit assessed the development to be generally compliant with the conditions of Development Consent DA-293-08-00 and no non-compliances were recorded. Fifteen (15) recommendations were provided which PON is currently working through in line with a schedule.

For further information regarding the Hazard Audit, please refer to the previously submitted Hazard Audit Report and correspondence with the Department.

11. OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

An OEMP was developed for the Mayfield 4 Berth on 26 November 2009 and subsequently updated on 18 January 2012, as a requirement of the DA (Section 4.4). The updated version was approved by the Department on 21 February 2012 (DPE Letter ref 09/00445-1).

A review of the OEMP was undertaken in September 2018 following feedback from the Department on the 2017 AEMR submission. The OEMP was then submitted to the Secretary General for Approval on 3 October 2018 and approved by the Department on 1 February 2018 (DPE Letter ref 18/924302).

The most recent review of the OEMP was performed in September 2021 following the 2020 Independent Environmental Audit, and the revised document was submitted to DPE on 29 September 2021 through the Planning Portal. The OEMP was accepted by DPE on 28 October 2021. Minor administrative alterations were made to the OEMP in November 2021.

The purpose of the OEMP relevant to the environmental performance of the site is to:

- Describe the proposed operations;
- Identify all the relevant statutory requirements that apply to the operations of the development;
- Set standards and performance measures for each of the relevant environmental issues;
- Describe what actions and measures will be implemented to mitigate the potential impacts of the development, and to ensure that the development meets these standards and performance measures;
- Describe what measures and procedures will be implemented to:
    - Register and respond to complaints
    - Ensure the operational health and safety of the workers; and
    - Respond to potential emergencies such as plant failure
- Describe the role, responsibility, authority and accountability of all the key personnel involved in the operation of the development;
- Incorporate the detailed Environmental Monitoring program (see DA Condition 8.1); and
- Include the following:
    - Stormwater Management Plan (DA Condition 5.30);
    - Capping maintenance Plan (DA Condition 5.20);
    - Contaminated Site Environmental Management Plan (DA Condition 4.1); and
    - Heavy vehicle Route Plan (DA Condition 5.46).

A copy of the OEMP is available on the Port of Newcastle public website at https://www.portofnewcastle.com.au/sustainable-port/environment/.

12. ENVIRONMENTAL PROTECTION LICENCE MONITORING

12.1. Assessment Criteria

Operations at Mayfield 4 Berth are subject to Environment Protection Licence (EPL) 13181 initially issued by the NSW EPA to NPC on 4 November 2009 and provided in Appendix B (current version dated 4 August 2020). The EPL specifies the locations and criteria for discharges to the environment, such as stormwater, and associated monitoring and reporting requirements.

EPL 13181 require the submission of an Annual Return within 60 days of the anniversary of the licence (28 January). The annual return requires that a Statement of Compliance and a summary of monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return submitted to the EPA for the 28 January 2021 to 27 January 2022 monitoring period is provided in Appendix C.

12.2. Meteorological Monitoring

PON are required to monitor weather parameters specified in Table 11.

Table 11: EPL 13181 Meteorological Monitoring Requirements

Parameter	Unit of Measure	Frequency
Sigma Theta	degrees	Continuous
Wind speed or run	m/s	Continuous
Wind direction	degrees	Continuous

In relation to the above requirements, the EPL states that loose bulk cargo operations must cease for a period of at least 15 minutes if the average wind speed exceeds seven metres per second (7 m/s) for a

five-minute period, or if wind gusts exceed 2 m/s. Operations must not recommence until the wind speed limits have not been exceeded for a period of 15 minutes. Wind speed limits do not apply when the following loose bulk cargoes are being loaded or unloaded:

- Cotton seed pellets;
- Ferro-alloys;
- Magnetite;
- Mineral sands;
- Nut coal;
- Urea granules;
- Wet Silica Sands; and
- Whole soya beans.

12.3. Results of Meteorological Monitoring

PON maintains an Automatic Weather Station (AWS) at the Mayfield 4 Berth site in accordance with the requirements of EPL 13181. The weather station has been operating since July 2011.

12.3.1. Rainfall

Monthly rainfall data recorded at the Mayfield 4 AWS is shown in Table 12. Rainfall data was sourced from weathers stations external to the Mayfield 4 Berth AWS for months October 2021 to January 2022 due to suspected failure of equipment at the M4 weather station.

Table 12: 2021 Rainfall Data for the Mayfield 4 Berth Automatic Weather Station over Reporting Period

Month	PON Monthly Rainfall (Mayfield 4, mm)	BOM Monthly Rainfall Nobbys Station* 6.7km Distance (mm)	BOM Monthly Rainfall Newcastle University* 2.4km from Mayfield (mm)
Jan-2021	154	Not available	57.4
Feb-21	159.8	14.2	95.9
Mar-21	117.5	129	82.6
Apr-21	24.3	14.8	6.3
May-21	60.8	Not available	Not available
Jun-21	91.8	66.6	Not available
Jul-21	38.5	25	Not available
Aug-21	90	36.4	Not available
Sep-21	52	67.4	Not available
Oct-21	Not available	59.6	Not available
Nov-21	Not available	233.4	Not available
Dec-21	Not available	27.8	Not available
Jan-22	Not available	45	Not available

* Nobby's data obtained from BOM weather station 61055; University of Newcastle data obtained from BOM weather station 61390.

12.3.2. Wind Speed and Direction

Wind speed and direction are recorded at the Mayfield 4 AWS to assist in interpreting air quality results. Wind Speed and direction data were included in the interpretation of the PM_{10} monitoring data and have not been included in this AEMR.

Section L5.2 of the EPL requires that wind speed is required to be monitored at Mayfield 4 Berth for operational purposes during loading and unloading of bulk cargos other than those listed in the EPL. Restriction requirements are set out in Section L5.2 of the EPL. PON's AWS has been fitted with an alarm and flashing light that are triggered when the specified wind parameters are met.

During the 2021 monitoring period there were no occasions where loose bulk cargo was handled at the site where the stevedores would have been required to comply with the EPL wind restrictions.

12.4. Vessel movements

PON maintains a register of vessel movements. Information included in the register includes the name of the vessel, length of time the vessel is berthed, and the material being handled (or if no material is being handled the reason for berthing). A full copy of the 2021 vessel movement register is provided in Appendix D. A summary of vessel operations is shown in Table 13.

Table 13: Summary of Vessel operations

Material	No. ship visits	% ship visits
Dry containers 20 x 8 x 8.5 ft	1	1.9
Grinding media	6	11.5
Ammonium Nitrate - in Bulker Bags	15	28.8
Steel and iron products	14	26.9
Industry machine equipment	5	9.6
Inorganic chemicals	1	1.9
Motor vehicle parts	1	1.9
Power generation machine equipment	6	11.5
Railway vehicle parts	3	5.8
Loose bulk cargo	0	0
TOTAL	**52**	**-**

There were 52 ship visits during the year, which is an increase of 17 visits compared to the previous year. There were zero bulk cargo handling activities at the berth for the reporting period.

In accordance with Schedule 2 conditions 7.1 to 7.4 of the consent, PON confirms that:

- There have been zero cargos classified as Class 7 Dangerous Goods either received or dispatched at the site during the reporting period.
- There has been no usage or storage (temporarily or otherwise) of any Class 1 dangerous goods at the site during the reporting period.
- All dangerous goods received at the site have been dispatched from the site within 72 hours of receiving those goods.

A copy of the dangerous goods register for the period is provided in Appendix H.

Most of cargo transfer was Ammonium Nitrate in bulker bags at 28.8%, followed by Steel and Iron Products at 26.9%, followed by Power Generation Machine Equipment and Grinding Media at 11.5% each. The total number of containers per annum handled in the reporting period was 20 containers. The remaining balance of cargo is in Table 13.

The total tonnage handled at the berth does not represent loose bulk cargo as defined by the POEO Act and Regulations and does not represent the range of 'scheduled activity' under the EPL.

12.5. Stormwater

Stormwater samples are collected monthly by environmental consultants RCA. The monitoring scope is as follows:

- Collection of surface water samples monthly during discharge, from the sampling points (as per EPL 13181).
- Laboratory analysis of surface water samples, including a field duplicate for quality assurance and quality control (QA/QC). Samples are analysed for pH, oil and grease, phosphate, total suspended solids (TSS), total nitrogen including nitrate plus nitrite as N and total Kjeldahl nitrogen (TKN).
- Inclusion of surface water results in a report.

12.5.1. Sampling Methodology

Prior to each sample collection, the sampling equipment is decontaminated with a phosphate free detergent and then rinsed with water. Surface water samples are collected in accordance with Australian Standard (AS/NZS) 5667.1:1998. Samples are then placed in an ice-filled esky and shipped under strict chain of custody protocol to a National Association of Testing Authorities (NATA) accredited laboratory. Field parameters were also recorded at the time of each sampling event.

Each of the sampling points is fitted with an automated water sampler to enable sample collection during discharge as per EPL 13181. The automated samplers chosen for the site are ISCO GLS type. The sampler was chosen based on physical size allowed to fit inside Pits 1, 2 and 3 on the berth, as due to the operational nature of the site no infrastructure is permitted to protrude above ground. Pit 4 sampler is in a cabinet adjacent to the pit so that the sampling lines are fed into the drain. An example of the automated water sampler is shown in Figure 13.

Figure 13: Automated Water Sampler on berth area

12.5.2. Water Quality Parameters

Analytical results have been assessed against the limits defined in EPL 13181 where a limit is available as per Table 8 of this report.

12.5.3. Frequency of Monitoring

Prior to November 2016, stormwater samples were required to be analysed monthly during discharge from four locations. From 3 November 2016 EPL 13181 was varied to amend the sampling frequency to the first discharge event following a loose bulk cargo operation. The licence variation also included the removal of Pit 4.

12.5.4. Review of Monitoring Results

As no loose bulk cargo was handled during the EPL period of 28 January 2021 to 27 January 2022, no surface water monitoring was required to be undertaken and therefore no results are presented. Please refer to the vessel register information in Appendix D.

12.5.5. Stormwater System Maintenance

Details of maintenance performed on the stormwater system by PON for the monitoring period can be seen in Table 14. Stevedores working under the stevedore licence at the berth also are required to clean the berth thoroughly after each cargo, and the cleaning method depend on cargo type. The clean-up activities are signed off by a PON Wharf Officer prior to the stevedores concluding operations.

Table 14: Stormwater System Maintenance 2021

Month	Pit Maintenance Performed
20 January 2021	Filters changed

Month	Pit Maintenance Performed
23 February 2021	All pits sucked and washed out clean. All filters changed
1 March 2021	Filters changed
28 April 2021	All pits sucked and washed out clean. All filters changed
27 May 2021	Filters Changed
28 June 2021	Filters Changed
30 July 2021	Filters Changed
27 August 2021	All pits sucked and washed out clean. All filters changed
29 September 2021	Filters changed.
29 October 2021	Filters Changed
26 November 2021	Filters Changed
9 December 2021	All pits sucked and washed out clean. All filters changed

13. COMPLAINTS

In accordance with schedule 2, Condition 9.9 of the Development Consent, a complaints register has been maintained throughout the reporting period to record details of complaints received regarding the site. For the 2021 monitoring period no complaints were reported to PON regarding environmental performance and therefore no action was required over the reporting period.

14. COMPLIANCE STATEMENT AND CONCLUSION

Overall, PON compliance with all the standards, performance measures and statutory requirements for the development was of a high standard.

Measures taken by PON to ensure ongoing compliance include:

- Continued maintenance of the stormwater systems, including regular cleaning of the drains (vac truck), filter change and procedures to include contractors entering the pits with a high-powered hose to ensure all sediment is removed during each clean out operation;
- Weekly environmental inspections of the berth;
- Frequent bulk handing inspections throughout the duration of any bulk shipment;
- Additional berth housekeeping inspections after each vessel operation;
- Regular sweeper truck operation to clean wharf areas; and
- Follow up of the Independent Environmental Audit actions until closed.

Table 15 presents a summary statement of compliance for the period.

Table 15: Summary of Compliance

Compliance Item	Result	Comments
Stormwater - pH	Compliant	No monitoring required for reporting period
Stormwater - Nitrogen	Compliant	No monitoring required for reporting period
Stormwater - Oil and Grease	Compliant	No monitoring required for reporting period
Stormwater - Phosphate	Compliant	No monitoring required for reporting period
Stormwater - Total Suspended Solids	Compliant	No monitoring required for reporting period
Sampling monthly during discharge	Compliant	No monitoring required for reporting period
Noise Monitoring	Compliant	No exceedances against criteria observed
PM_{10} 24 hour	7 exceedances out of 60 samples	DPE Lower Hunter Air Quality Monitoring network demonstrated similar elevated levels for 4 dates suggesting that factors external to M4 operations are likely contributing to elevated readings at this site for the 4 dates described. However for 3 remaining dates of 24 September, 5 December and 29 December ambient dust concentrations may have been associated with patches of dirt on the bitumen surface where vehicle movements were occurring. Measures to ameliorate ambient dust will continue to be performed onsite.
PM_{10} Annual Average	Average consistently above the revised annual criterion	The annual average is similar to previous year and considered to represent background fine atmospheric particulates in the Newcastle industrial area. The rolling average annual criterion has reduced. Elevations appeared to coincide with factors external to operations.
TSP Annual Average	Compliant	The decrease in remediation activities and sealing of ground surface on adjacent land is thought to have contributed to the overall improvement in TSP.

Compliance Item	Result	Comments
2020 Independent Environmental Audit outcomes	Ongoing and Compliant	Actions identified have been either closed out or are ongoing.
2020 Hazard Audit outcomes	Ongoing and on time	Actions identified have been either closed out or are on schedule.

The objective of the AEMR is to identify the standards, performance measures and statutory requirements related to operations at the Mayfield 4 Berth, and to assess actual performance relative to the requirements.

Overall, PON compliance with all the standards, performance measures and statutory requirements for the operation was of a high standard. Ongoing compliance has been demonstrated for the annual noise monitoring and no complaints have been received relating to the site during the reporting period. PON continue to improve and implement procedures to effectively manage potential environmental impacts from site operations.

The 2020 Independent Environmental Audit Report showed that the development was generally compliant with the conditions of Development Consent DA-293-08-00. Five (5) non-compliance issues were identified which have been closed out.

The 2020 Hazard Audit Report showed that the development was generally compliant with the DA conditions.

Annual noise monitoring performed at M4 and surrounds showed that no exceedances of the applied criteria were observed.

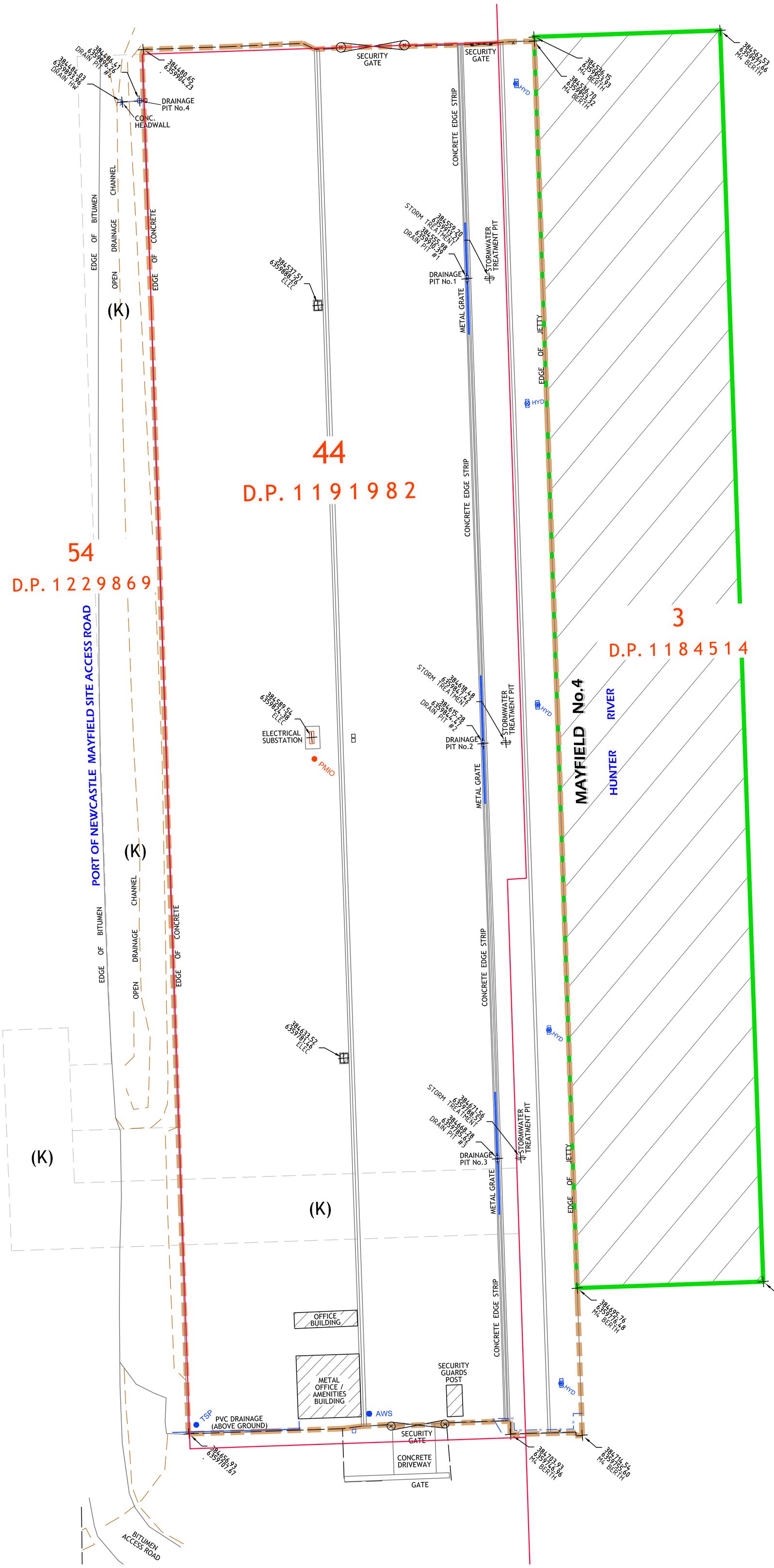
Air quality non-compliances occurred and were identified when the berth was not handling cargo. An analysis of the exceedances showed that the measured PM_{10} levels appear to be influenced by external sources as well as potential ambient dust concentrations been associated with patches of dirt on the bitumen surface where vehicle movements were occurring. TSP levels were well below the annual average criterion of 90 $\mu g/m^3$.

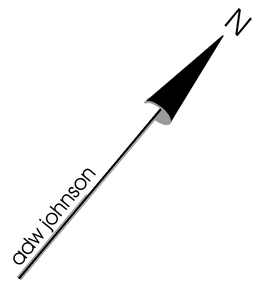
No complaints of an environmental nature were received during the reporting period, which may indicate general community satisfaction with PON environmental performance.

PON has recently completed the Sustainability Report for 2021 which applies to the whole of port area, and will shortly be available on the PON website.

APPENDIX A – SITE PLAN EPL LICENCE AREA MAYFIELD 4

Plan of:	EPA License Area, Mayfield No.4 within Lot 44 DP.1191982	Datum:	n/a	Date:	1/08/2013	Version:	E (19/02/2020)
		Origin:	-	Sheet:	1 of 1	Client:	Port of Newcastle
		Projection:	MGA (GDA2020)	Plan By:	RC	Survey:	12D\238927(1)
Location:	Mayfield	Origin:	-	Project Manager:	TC	AutoCAD:	N:\ . . .\238927(1)-LEASE-002-E
Council:	Newcastle	North Direction:	Grid	Office:	Hunter	Our Ref:	238927 (1)
		Contour Interval:	-	Plan Purpose:	Lease		





adw johnson

0m 5 10 20 40

Bar Scale 1: 400 (A1), 1: 800 (A3)

PORT of NEWCASTLE

LEGEND

- AWS AUTOMATIC WEATHER STATION
- TSP TSP HVAS
- PMIO PMIO HVAS
- STORMWATER TREATMENT PIT (UNDER WHARF)
- SITE BOUNDARY
- BOUNDARY LINE
- EMBANKMENT
- EDGE OF ROAD
- FENCE LINE
- OVER WATER OPERATION AREA

I, TREVOR JAMES CARTER, A SURVEYOR REGISTERED UNDER THE SURVEYING AND SPATIAL INFORMATION ACT 2002, CERTIFY THAT THE TITLE INFORMATION SHOWN ON THIS PLAN IS CORRECT AS OF THE 19/02/2020

. . . . . .

Registered Surveyor
ADW Johnson Pty. Ltd.
Surv. Ref: 238927(1)

(K) EASEMENT FOR DRAINAGE OF WATER 12.5 WIDE (DP.1191982)

Ver.	Date	Comment	By
E	19/02/2020	License Plan	RC

adw johnson pty. ltd.
unit 7, building 2, 335 hillsborough road, warners bay 2282
ph: (02) 49785100 fax: (02) 49785199 hunter@adwjohnson.com.au abn 62 129 445 398

Plotted By: robertc Plot Date: 20/02/20 - 08:57 Cad File: N:\238927\238927(1)\DWG\238927(1)-LEASE-002-E.dwg

APPENDIX B – EPL 13181

Environment Protection Licence

Licence - 13181

Licence Details	
Number:	13181
Anniversary Date:	28-January

Licensee

PORT OF NEWCASTLE OPERATIONS PTY LIMITED

PO BOX 790

NEWCASTLE NSW 2300

Premises

MAYFIELD NO. 4 BERTH

OFF SELWYN STREET

MAYFIELD NORTH NSW 2304

Scheduled Activity

Shipping in bulk

Fee Based Activity	Scale
Shipping in bulk	> 100000-500000 T of annual capacity to load and unload

Region

Metropolitan North - Newcastle

Ground Floor, NSW Govt Offices, 117 Bull Street
NEWCASTLE WEST NSW 2302

Phone: (02) 4908 6800

Fax: (02) 4908 6810

PO Box 488G

NEWCASTLE NSW 2300

Environment Protection Licence

Licence - 13181

Environment Protection Licence

Licence - 13181

Environment Protection Licence

Licence - 13181

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence

Licence - 13181

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

PORT OF NEWCASTLE OPERATIONS PTY LIMITED
PO BOX 790
NEWCASTLE NSW 2300

subject to the conditions which follow.

Environment Protection Licence

Licence - 13181

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Shipping in bulk	Shipping in bulk	> 100000 - 500000 T of annual capacity to load and unload

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
MAYFIELD NO. 4 BERTH
OFF SELWYN STREET
MAYFIELD NORTH
NSW 2304
PREMISES AS MARKED AND SHOWN WITHIN THE ORANGE DASHED LINE IDENTIFIED AS "SITE BOUNDARY" ON THE PLAN TITLED "EPA LICENSE AREA, MAYFIELD NO. 4 WITHIN LOT 44 DP.1191982", PREPARED BY ADW JOHNSON, VERSION F DATED 20/02/2020 (EPA REF. DOC20/137140), HEREAFTER REFERRED TO IN THE LICENCE AS THE 'PREMISES PLAN'. THE PREMISES ALSO INCLUDES THE AREA MARKED AND SHOWN WITHIN THE GREEN LINE ON THE PREMISES PLAN AS "OVER WATER OPERATIONAL AREA" WHENEVER THE SCHEDULED ACTIVITY OF 'SHIPPING IN BULK' IS CARRIED OUT AS AUTHORISED BY THIS LICENCE.

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and

b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
4	Discharge to waters Discharge quality monitoring	Discharge to waters Discharge quality monitoring	Discharge from the northern Humeceptor to the Hunter River marked and shown as "Drainage Pit No. 1" on the Premises Plan.
5	Discharge to waters Discharge quality monitoring	Discharge to waters Discharge quality monitoring	Discharge from the central Humeceptor to the Hunter River marked and shown as "Drainage Pit No. 2" on the Premises Plan.
6	Discharge to waters Discharge quality monitoring	Discharge to waters Discharge quality monitoring	Discharge from the southern Humeceptor to the Hunter River marked and shown as "Drainage Pit No. 3" on the Premises Plan.

P1.2 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

EPA identification no.	Type of monitoring point	Location description
7	Meteorological Station	Automatic weather station marked and shown as "AWS" on the Premises Plan.

P1.3 For the purposes of the above table(s), the 'Premises Plan' is defined in Condition A2.1.

3 Limit Conditions

Environment Protection Licence

Licence - 13181

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 The following concentration limit conditions only apply during for the first discharge event following a loose bulk cargo operation. At all other times condition L1.1 applies.

L2.2 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.3 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.4 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

L2.5 Water and/or Land Concentration Limits

POINT 4,5,6

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Nitrogen (total)	milligrams per litre				10
Oil and Grease	milligrams per litre				10
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50

L3 Waste

L3.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

L3.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.

L4 Potentially offensive odour

L4.1 No condition of this licence identifies a potentially offensive odour for the purposes of Section 129 of the Protection of the Environment Operations Act 1997.

L4.2 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

L5 Other limit conditions

Wind speed limits for loose bulk cargo operations

L5.1 Loose bulk cargo operations must cease for a period of at least 15 minutes:
a) if the average wind speed exceeds 7 metres per second for a 5 minute period, or
b) if a wind gust exceeds 12 metres per second.

After loose bulk cargo operations have ceased, they must not recommence until the above wind speed limits are not exceeded in the preceding 15-minute time period.

L5.2 The wind speed and direction limits specified in Condition L5.1 do not apply when the following loose cargoes are loaded or unloaded from the premises:
a) Cottonseed pellets;
b) Ferro-alloys;
c) Magnetite;
d) Mineral sands;
e) Nut coal;
f) Urea granules;
g) Wet silica sands; and
h) Whole soya beans.

Metals Concentrates

L5.3 The licensee must not receive, store, load or unload Copper, Lead, or Zinc concentrates at the premises.

4 Operating Conditions

Environment Protection Licence

Licence - 13181

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

O3.2 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

O3.3 Trucks entering and leaving the premises that are carrying loads of dust generating materials must have their loads covered at all times, except during loading and unloading.

O4 Emergency response

Note: The licensee must maintain, and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises. The PIRMP must be developed in accordance with the requirements in Part 5.7A of the Protection of the Environment Operations (POEO) Act 1997 and POEO regulations. The licensee must keep the incident response plan on the premises at all times. The incident response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. The PIRMP must be tested at least annually or following a pollution incident.

O5 Waste management

O5.1 The licensee must ensure that any liquid and/or non liquid waste generated and/or stored at the premises is assessed and classified in accordance with the EPA's Waste Classification Guidelines as in force from time to time.

O5.2 The licensee must ensure that waste identified for recycling is stored separately from other waste.

O5.3 All wastewater generated from the on-site treatment of sewage must be removed from the premises by a licensed waste transporter and taken to a facility that is able to lawfully receive it and reuse or dispose of it.

O5.4 The licensee must not dispose of sewage at the premises.

O6 Other operating conditions

Wharf deck loading and unloading requirements

O6.1 Loose bulk cargo to be unloaded onto or loaded from the wharf deck must be fully contained to prevent dust emissions and pollution of waters.

O6.2 Loose bulk cargo must not be stockpiled on the wharf deck for a period exceeding 24 hours prior to the commencement of loose bulk cargo loading operations or for a period exceeding 24 hours after the completion of loose bulk cargo unloading operations.

Tracking of materials

O6.3 The licensee must ensure that activities are conducted in an environmentally satisfactory manner. So as to minimise and prevent the pollution of air and water the licensee must:
a) Ensure that vehicles or containers prior to leaving the premises are clean and sealed in a manner that will not cause materials or wastes used in conducting the activities at the premises to be tracked, thrown from, blown, fall, or cast from any vehicle or container onto a public road.
b) The licensee must have in place and implement procedures to ensure that vehicles and containers exiting the premises are in a condition to ensure that materials are not tracked, thrown, blown, fall or cast onto a public road.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and

d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Water and/ or Land Monitoring Requirements

POINT 4,5,6

Pollutant	Units of measure	Frequency	Sampling Method
Nitrogen (total)	milligrams per litre	Special Frequency 1	Grab sample
Oil and Grease	milligrams per litre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 1	Grab sample
Phosphate	milligrams per litre	Special Frequency 1	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample

M2.3 For the purpose of the table(s) above, Special Frequency 1 means the collection of samples during the first discharge event following a loose bulk cargo operation. Only one discharge event is required to be sampled each calendar month.

M3 Testing methods - concentration limits

M3.1 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Weather monitoring

M4.1 At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.

Environment Protection Licence

Licence - 13181

POINT 7

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Wind Speed at 10 metres	AM-2 & AM-4	metres per second	15 minutes	Continuous
Wind Direction at 10 metres	AM-2 & AM-4	Degrees	15 minutes	Continuous

M5 Recording of pollution complaints

M5.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M5.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M6 Telephone complaints line

M6.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M6.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M6.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M7 Other monitoring and recording conditions

Requirement to record the transfer of the occupation of the berth

M7.1 The licensee must record details of when (i.e. time and date) the occupation of berth is transferred to another person. The licensee must record details of the name and telephone contact of the person that

the berth is transferred to.

Requirement to record shipping and cargo information

M7.2 For the loading and discharge of cargo from ships carried out under the licence, the licensee must record the following information.

a) The time and date that the ship was berthed.
b) The name of the ship.
c) A description of the cargo and tonnage loaded/discharged.
d) The owner and agent of the cargo.
e) An assessment of the capacity of the cargo to generate dust during loading/discharge activities.
f) Dust control measures for the loading/discharge of the cargo.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is

given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;

c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

G2 Contact number for incidents and responsible employees

G2.1 The licensee must nominate to the EPA a representative of the licensee that is available at all times and is capable of providing immediate assistance or response during emergencies or any other incidents at the premises. The name of the nominated representative and their contact details, including their mobile telephone number, must be current at all times. The nomination and contact details must be provided to the EPA at PO Box 488G, Newcastle NSW 2300 or by email to RegOps.MetroRegulation@epa.nsw.gov.au .

G3 Other general conditions

G3.1 **Completed Programs**

Program	Description	Completed Date
PRP 1 - Stormwater Management Systems Upgrade	The licensee must design , install and commission upgrades to the stormwater management system.	16-December-2011

Environment Protection Licence

Licence - 13181

PRP 2- Investigation of Copper Sources	The licensee must investigate and identify potential sources of copper, report and develop a copper management strategy	22-February-2013

Environment Protection Licence

Licence - 13181

Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 13181

flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 mo nths. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

Environment Protection Licence

Licence - 13181

TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Mitchell Bennett

Environment Protection Authority

(By Delegation)

Date of this edition: 04-November-2009

Environment Protection Licence

Licence - 13181

End Notes

1	Licence varied by notice 1109287, issued on 01-Dec-2009, which came into effect on 01-Dec-2009.
2	Licence varied by notice 1111996, issued on 02-Mar-2010, which came into effect on 02-Mar-2010.
3	Licence varied by notice 1128690, issued on 08-Jul-2011, which came into effect on 08-Jul-2011.
4	Licence varied by notice 1501029 issued on 04-Nov-2011
5	Licence varied by notice 1504050 issued on 19-Mar-2012
6	Licence varied by notice 1507488 issued on 04-Mar-2013
7	Licence varied by notice 1515235 issued on 12-Jul-2013
8	Licence varied by notice 1516638 issued on 04-Sep-2013
9	Licence varied by notice 1519040 issued on 20-Dec-2013
10	Licence transferred through application 1520262 approved on 27-Feb-2014 , which came into effect on 28-Feb-2014
11	Licence varied by notice 1521970 issued on 10-Jun-2014
12	Licence varied by notice 1525248 issued on 03-Nov-2014
13	Licence varied by notice 1528564 issued on 18-Feb-2015
14	Licence fee period changed by notice 1531721 on 04-Nov-2015
15	Licence varied by notice 1545383 issued on 03-Nov-2016
16	Licence varied by notice 1591493 issued on 04-Aug-2020

APPENDIX C – EPL 13181 ANNUAL RETURN

Annual Return

PORT OF NEWCASTLE OPERATIONS PTY LIMITED

Licence 13181

A. Statement of Compliance - Licence Details

ALL Licence holders must check that the Licence details in Section A are correct.

If there are changes to any of these details, **you must advise Environment Protection Authority (EPA) and apply as soon as possible for a variation to your Licence or for a Licence transfer.**

Licence variation and transfer application forms are available on the EPA website at: http://www.epa.nsw.gov.au/licensing-and-regulation/licensing or from regional offices of the EPA, or by contacting by telephone 02 9995 5700.

If you are applying to vary or transfer your Licence, you must still complete and submit this Annual Return.

A1. Licence holder

Licence number : 13181

Licence holder : PORT OF NEWCASTLE OPERATIONS PTY LIMITED

Trading name *(if applicable)* :

ABN : 13 165 332 990

ACN : 165 332 990

Reporting period : From: 28-1-2021 To: 27-1-2022

A2. Premises to which Licence Applies (if applicable)

Common name (if any) : MAYFIELD NO. 4 BERTH

Premises : OFF SELWYN STREET MAYFIELD NORTH 2304 NSW

A3. Activities to which Licence Applies

Shipping in bulk

A4. Other Activities (if applicable)

A5. Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Shipping in bulk	> 100,000.00 - 500,000.00	T of annual capacity to load and unload

A6. Assessable Pollutants (if applicable)

Note that the identification of assessable pollutants is used to calculate the **load-based fee.**
The following assessable pollutants are identified for the fee-based activity classifications in the licence:

B. Monitoring and Complaints Summary

B1. Number of Pollution Complaints

Pollution Complaint Category	Complaints
Air	0
Water	0
Noise	0
Waste	0
Other	0
Total complaints recorded by the licensee during the reporting period	**0**

B2. Concentration Monitoring Summary

For each concentration monitoring point identified in your licence, details are displayed below. If concentration monitoring is not required by your licence, **no data** will appear below.
If data was provided from an uploaded file, the file name will be displayed below instead of any data.
Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Discharge & Monitoring Point 4

Discharge to waters
Discharge quality monitoring, Discharge from the northern Humeceptor to the Hunter River marked and shown as "Drainage Pit No. 1" on the Premises Plan.

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Nitrogen (total)	milligrams per litre	0	0	N/A	N/A	N/A
Oil and Grease	milligrams per litre	0	0	N/A	N/A	N/A
pH	pH	0	0	N/A	N/A	N/A
Phosphate	milligrams per litre	0	0	N/A	N/A	N/A
Total suspended solids	milligrams per litre	0	0	N/A	N/A	N/A

Discharge & Monitoring Point 5

Discharge to waters
Discharge quality monitoring, Discharge from the central Humeceptor to the Hunter River marked and shown as "Drainage Pit No. 2" on the Premises Plan.

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Nitrogen (total)	milligrams per litre	0	0	N/A	N/A	N/A
Oil and Grease	milligrams per litre	0	0	N/A	N/A	N/A
pH	pH	0	0	N/A	N/A	N/A
Phosphate	milligrams per litre	0	0	N/A	N/A	N/A
Total suspended solids	milligrams per litre	0	0	N/A	N/A	N/A

Discharge & Monitoring Point 6

Discharge to waters
Discharge quality monitoring, Discharge from the southern Humeceptor to the Hunter River marked and shown as "Drainage Pit No. 3" on the Premises Plan.

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Nitrogen (total)	milligrams per litre	0	0	N/A	N/A	N/A
Oil and Grease	milligrams per litre	0	0	N/A	N/A	N/A
pH	pH	0	0	N/A	N/A	N/A
Phosphate	milligrams per litre	0	0	N/A	N/A	N/A
Total suspended solids	milligrams per litre	0	0	N/A	N/A	N/A

B2 Concentration Monitoring Comments

Monitoring is required at Points 4, 5 and 6 following a loose bulk cargo operation only. No loose bulk cargo operations occurred during the reporting period.

B3. Volume or Mass Monitoring Summary

For each volume or mass monitoring point identified in your licence, details are displayed below. If volume or mass monitoring is not required by your licence, **no data** will appear below.
If data was provided from an uploaded file, the file name will be displayed below instead of any data.
Note that this does not exclude the need to conduct appropriate volume or mass monitoring of assessable pollutants are required by load-based licensing (if applicable).

C. Statement of Compliance - Licence Conditions

C1. Compliance with Licence Conditions

Were all conditions of the licence complied with (including monitoring and reporting requirements)?	**Yes**

D. Statement of Compliance - Load Based Fee Calculation

If you are not required to monitor assessable pollutants by your licence, **no data** will appear below.

If assessable pollutants have been identified on your licence, the following worksheets for each assessable pollutant will determine your load based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been already sent to you with your licence. If you require additional copies, you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

E. Statement of Compliance - Requirement to Prepare PIRMP

Have you prepared a Pollution Incident Response Management Plan (PIRMP) as required under section 153A of the Protection of the Environment Operations (POEO) Act 1997?	**Yes**
Is the PIRMP available at the premises?	**Yes**
Is the PIRMP available in a prominent position on a publicly accessible website?	**Yes**
Address of the web page where the PIRMP can be accessed ▼	
https://www.portofnewcastle.com.au/wp-content/uploads/2019/09/Port-of-Newcastle-PIRMP-Mayfield-4Final-PIRMP-M4-website-copy.pdf	
Has the PIRMP been tested?	**Yes**
The PIRMP was last tested on	**27-5-2021**
Has the PIRMP been updated?	**No**
Number of times the PIRMP was activated in this reporting period?	**0**

The PIRMP was activated on	

F. Statement of Compliance - Requirement to Publish Pollution Monitoring Data

Are there any conditions attached to your licence that require pollution monitoring to be undertaken as required under section 66(6) of the Protection of the Environment Operations (POEO) Act 1997?	**Yes**
Do you operate a website?	**Yes**
Is the pollution monitoring data published on your website in accordance with the EPA's written requirements for publishing pollution monitoring data?	**Yes**
Address of the web page where the pollution monitoring data can be accessed ▼	
https://www.portofnewcastle.com.au/sustainable-port/environment/	

G. Statement of Compliance - Environment Management System and Practices

Do you have an ISO 14001 certified Environmental Management System (EMS) OR any other system that EPA considers is equivalent to the accountability, procedures, documentation and record keeping requirements of an ISO 14001 certified EMS?	**Yes**
When was the last check (As per ISO 14001) of the EMS completed?	**20-8-2018**
Were there any non-conformances related to environmental issues identified in the last check of the EMS?	**No**
If there were non-conformances identified, were these non-conformances rectified?	

H. Signature and Certification

This Annual Return may only be signed by person(s) with legal authority to sign it as set out in following categories: an Individual, a Company, a Public authority or a Local council.

It is an offence under section 66 of the Protection of the Environment Operations Act 1997 to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of $250,000 for a corporation and $120,000 for an individual.

I/We

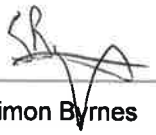
- declare that the information in the Monitoring and Complaints Summary in Section B of this Annual Return application is correct and not false or misleading in a material respect, and
- certify that the information in the Statement and Compliance in sections A, C, D, E, F, G and H and any other pages attached to Section C is correct and not false or misleading in a material respect.

Signature	
Name	Craig Carmody
Position	Chief Executive Officer
Date	23 / 03 / 2022

Declaration

I declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and

I certify that the information in the Statement of Compliance in section A,C,D,E,F and G and any pages attached to Section C is correct and not false or misleading in a material respect.

Signature	
Name	Simon Byrnes
Position	Chief Commercial Officer
Date	14 / 03 / 2022

Declaration

I declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and

I certify that the information in the Statement of Compliance in section A,C,D,E,F and G and any pages attached to Section C is correct and not false or misleading in a material respect.

APPENDIX D – VESSEL MOVEMENT REGISTER

Vessel Name	Material	Load/Unload	Arrival	Time	Departure Date	Time
BBC NAGASAKI	GRINDING MEDIA	Load	6/01/2021	17:50	9/01/2021	11:35
BBC NAGASAKI	IRON AND STEEL PRODUCTS	Load	6/01/2021	17:50	9/01/2021	11:35
JANNES	AMMONIUM NITRATE	Unload	12/01/2021	11:38	13/01/2021	15:48
BBC MARMARA	POWER GEN.MACH. EQUIP.	Unload	30/01/2021	9:24	31/01/2021	21:50
JANNES	AMMONIUM NITRATE	Unload	1/02/2021	12:10	3/02/2021	8:59
HAPPY ROVER	GRINDING MEDIA	Load	12/02/2021	13:49	25/02/2021	11:36
HAPPY ROVER	IRON AND STEEL PRODUCTS	Load	12/02/2021	13:49	25/02/2021	11:36
ASIA PEARL VII	AMMONIUM NITRATE	Unload	18/02/2021	8:55	21/02/2021	11:36
FLORAGRACHT	AMMONIUM NITRATE	Unload	1/03/2021	17:00	5/03/2021	15:25
BBC RUSHMORE	20X8X8.5FT DRY CONTAINER	Unload	10/03/2021	6:58	11/03/2021	16:08
BBC RUSHMORE	POWER GEN.MACH. EQUIP.	Unload	10/03/2021	6:58	11/03/2021	16:08
AAL NEWCASTLE	POWER GEN.MACH. EQUIP.	Unload	15/03/2021	13:00	20/03/2021	18:15
BBC ILLINOIS	POWER GEN.MACH. EQUIP.	Unload	22/03/2021	17:50	23/03/2021	1:23
BBC RUSHMORE	GRINDING MEDIA	Load	24/03/2021	10:16	26/03/2021	14:36
BBC RUSHMORE	IRON AND STEEL PRODUCTS	Load	24/03/2021	10:16	26/03/2021	14:36
BBC RUSHMORE	MOTOR VEHICLE PARTS NES + ACCE	Load	24/03/2021	10:16	26/03/2021	14:36
BBC CARIBBEAN	POWER GEN.MACH. EQUIP.	Load	27/03/2021	6:05	31/03/2021	8:37
SLOMAN DISPATCHER	IRON AND STEEL PRODUCTS	Load	24/04/2021	19:26	27/04/2021	3:46
MOLENGRACHT	AMMONIUM NITRATE	Unload	4/05/2021	8:35	8/05/2021	12:06
AAL PARIS	IRON AND STEEL PRODUCTS	Unload	8/05/2021	16:10	13/05/2021	1:45
BBC ILLINOIS	AMMONIUM NITRATE	Unload	19/05/2021	2:55	25/05/2021	22:28
BBC ILLINOIS	INDUST.MACH. EQUIP. NES.	Load	19/05/2021	2:55	25/05/2021	22:28
BBC ILLINOIS	IRON AND STEEL PRODUCTS	Load	19/05/2021	2:55	25/05/2021	22:28
BBC SKIPPER	POWER GEN.MACH. EQUIP.	Load	19/05/2021	4:04	26/05/2021	23:10
AAL SHANGHAI	INDUST.MACH. EQUIP. NES.	Unload	7/06/2021	8:18	11/06/2021	17:26
MITO	AMMONIUM NITRATE	Unload	14/07/2021	7:25	16/07/2021	12:00
HUDSONGRACHT	IRON AND STEEL PRODUCTS	Unload	28/07/2021	19:25	2/08/2021	4:18
BBC GERMANY	INDUST.MACH. EQUIP. NES.	Unload	2/08/2021	19:26	3/08/2021	20:36
BBC GERMANY	RAILWAY VEH'SPARTS ETC	Unload	2/08/2021	19:26	3/08/2021	20:36
LEANNE AUERBACH	AMMONIUM NITRATE	Unload	4/08/2021	20:02	8/08/2021	1:53
JANNES	GRINDING MEDIA	Load	27/08/2021	13:36	29/08/2021	9:41
MARATHA PRESTIGE	IRON AND STEEL PRODUCTS	Unload	2/09/2021	0:53	9/09/2021	17:00
BRONZE LADY	AMMONIUM NITRATE	Unload	11/09/2021	6:35	13/09/2021	5:35
CHIPOL BAOAN	IRON AND STEEL PRODUCTS	Unload	24/09/2021	5:42	29/09/2021	19:18
BBC PERU	AMMONIUM NITRATE	Unload	29/09/2021	10:48	3/10/2021	6:35
BBC ECHO	GRINDING MEDIA	Unload	3/10/2021	9:58	5/10/2021	15:45
BBC ECHO	RAILWAY VEH'SPARTS ETC	Unload	3/10/2021	9:58	5/10/2021	15:45
ORIENTAL SPIRIT	AMMONIUM NITRATE	Unload	11/10/2021	15:40	14/10/2021	4:33
GARDENIA K	IRON AND STEEL PRODUCTS	Unload	22/10/2021	12:30	3/11/2021	23:20
BBC PERU	AMMONIUM NITRATE	Unload	2/11/2021	13:58	9/11/2021	21:39
ORIENTAL SPIRIT	AMMONIUM NITRATE	Unload	12/11/2021	2:54	14/11/2021	16:07
LIV AUERBACH	AMMONIUM NITRATE	Unload	15/11/2021	03:30	17/11/2021	4:30
DINO	IRON AND STEEL PRODUCTS	Unload	1/12/2021	2:12	8/12/2021	20:55
BBC NAPLES	INDUST.MACH. EQUIP. NES.	Load	9/12/2021	2:00	10/12/2021	22:50
PS VALLETTA	IRON AND STEEL PRODUCTS	Unload	13/12/2021	13:09	22/12/2021	15:30
SHANGHAI SPIRIT	AMMONIUM NITRATE	Unload	22/12/2021	17:03	24/12/2021	16:22
SHANGHAI SPIRIT	INORGANIC CHEMICALS NES	Unload	22/12/2021	17:03	24/12/2021	16:22
BBC GDANSK	GRINDING MEDIA	Unload	25/12/2021	16:40	30/12/2021	3:52
BBC GDANSK	RAILWAY VEH'SPARTS ETC	Unload	25/12/2021	16:40	30/12/2021	3:52
BBC EVEREST	INDUST.MACH. EQUIP. NES.	Load	28/12/2021	20:10	31/12/2021	22:36
ACACIA	IRON AND STEEL PRODUCTS	Unload	6/01/2022	18:20	12/01/2022	11:00
TBC PRIME	IRON AND STEEL PRODUCTS	Unload	12/01/2022	11:17	25/01/2022	5:12
BBC DELAWARE	AMMONIUM NITRATE	Unload	29/01/2022	8:32	1/02/2022	14:34
BBC DIAMOND	RAILWAY VEH'SPARTS ETC	Unload	16/02/2022	19:46	19/02/2022	8:21

APPENDIX E – HISTORICAL AIR QUALITY DATA

Date	24 Hour TSP Concentration (µg/m^3)	24 Hour PM10 Concentration (µg/m^3)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
26/11/2009		60		NA		Baseline Report			90	50	25
2/12/2009		87.4*		SSE		Baseline Report			90	50	25
8/12/2009		N/A		SSW		Baseline Report			90	50	25
14/12/2009		16		ESE		Baseline Report			90	50	25
20/12/2009		33		ENE-SE (clockwise)		Baseline Report			90	50	25
26/12/2009		7		SSW		Baseline Report			90	50	25
1/01/2010		26		NW		Yes			90	50	25
7/01/2010		28		SE		No			90	50	25
13/01/2010		54		SSW		No			90	50	25
19/01/2010		33		SW		No			90	50	25
25/01/2010		45		ESE		No			90	50	25
31/01/2010		44		E		No			90	50	25
6/02/2010		30		ESE		No			90	50	25
12/02/2010		52		WNW		No			90	50	25
18/02/2010		36		SSE		No			90	50	25
24/02/2010		32		ESE		No			90	50	25
2/03/2010		18		SE		No			90	50	25
8/03/2010		41		NNE		Yes			90	50	25
14/03/2010		6		ESE		No			90	50	25
20/03/2010		43		NW		No			90	50	25
26/03/2010		70		NNW		No			90	50	25
1/04/2010		41		SW		No			90	50	25
7/04/2010		19		N		No			90	50	25
13/04/2010		36		NW		No			90	50	25
19/04/2010		45		ESE		Yes			90	50	25
25/04/2010		16		SW		No			90	50	25
1/05/2010		15		WSW		No			90	50	25
7/05/2010		33		NW		No			90	50	25
13/05/2010		39		SW		No			90	50	25
19/05/2010		13		SW		No			90	50	25
25/05/2010		NO DATA							90	50	25
31/05/2010		NO DATA							90	50	25
6/06/2010		8		SW		No			90	50	25
12/06/2010		10		SW		Yes			90	50	25
18/06/2010		23		WNW		No			90	50	25
24/06/2010		26		NE		Yes			90	50	25
30/06/2010		41		WNW		Yes			90	50	25
9/07/2010		7		NW		No			90	50	25
12/07/2010		21		N		No			90	50	25
18/07/2010		35		NW		No			90	50	25
24/07/2010		17		SW		No			90	50	25
30/07/2010		<0.1		NW		No			90	50	25
5/08/2010		47		WNW		No			90	50	25
11/08/2010		72		NW		No			90	50	25
17/08/2010		35		ESE		No			90	50	25
23/08/2010		32		WNW		No			90	50	25
29/08/2010		31		SE		No			90	50	25
4/09/2010		33		NW		No			90	50	25
10/09/2010		52		W		Yes			90	50	25
16/09/2010		101		WNW		No			90	50	25
22/09/2010		22		E		No			90	50	25
28/09/2010		36		SW		No			90	50	25
4/10/2010		22		E		No			90	50	25

Date	24 Hour TSP Concentration (µg/m^3)	24 Hour PM10 Concentration (µg/m^3)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
10/10/2010		37		ENE		No			90	50	25
16/10/2010		26		WNW		No			90	50	25
22/10/2010		49		NNW		Yes			90	50	25
28/10/2010		19		SE		No			90	50	25
3/11/2010		28		E,SE,SWS		No			90	50	25
9/11/2010		33		NE		No		33.3	90	50	25
15/11/2010		40		WSW,SWS		No		33.2	90	50	25
21/11/2010		29		E		No		33.9	90	50	25
27/11/2010		74		NE		No		33.4	90	50	25
3/12/2010		31		ESE		No		33.8	90	50	25
9/12/2010		57		SW,WNW		Yes		33.3	90	50	25
15/12/2010		3		SSE		No		33.9	90	50	25
21/12/2010		53		SSW		No		33.8	90	50	25
27/12/2010		24		S		No		34.3	90	50	25
2/01/2011		*		S		No		34.3	90	50	25
8/01/2011		26		ENE		Yes		34.8	90	50	25
14/01/2011		57		NE		No		34.5	90	50	25
20/01/2011		40		ENE		No		34.8	90	50	25
26/01/2011		50		S AND E		No		36.9	90	50	25
1/02/2011		168		West Northwest		No		36.7	90	50	25
7/02/2011		32		South east		No		36.6	90	50	25
13/02/2011		20		South		No		36.4	90	50	25
19/02/2011		44		North and North East		No		36.7	90	50	25
25/02/2011		51		East		No		36.9	90	50	25
3/02/2011		46		W,E AND SE		No		37.5	90	50	25
9/02/2011		48		NNW		No		37.3	90	50	25
15/02/2011		31		SW	225	No		37.7	90	50	25
21/02/2011		28		NE	45	No		37.2	90	50	25
27/02/2011		15		SE	135	No		36.5	90	50	25
2/04/2011		31		South South East	157.5	No		36.4	90	50	25
8/04/2011		no result		N/A	N/A	N/A		42.0	90	50	25
14/04/2011		339		West South West	292.5	No		42.2	90	50	25
20/04/2011		47		North West	315	No		41.7	90	50	25
26/04/2011		16		East	90	No		42.0	90	50	25
2/05/2011		30	0.0	South West	225	Yes		42.2	90	50	25
8/05/2011		30	0.0	South	180	No		41.9	90	50	25
14/05/2011		16	0.0	South West	225	Yes		41.9	90	50	25
20/05/2011		39	0.0	East North east	67.5	Yes		42.4	90	50	25
26/05/2011		no result	1.6	South West	225	No		41.9	90	50	25
29/05/2011		14	0.2	South west	225	No		41.8	90	50	25
1/06/2011		34	0.8	East	90	Yes		42.2	90	50	25
7/06/2011		32	0.0	West north West	292.5	No		42.8	90	50	25
13/06/2011		no result	0.4	East South East	112.5	No		42.9	90	50	25
19/06/2011		30	0.0	West Nort west	292.5	Yes		43.1	90	50	25
25/06/2011		39	0.0	North West	270	Yes	31.0	42.7	90	50	25
1/07/2011	31	13	1.6	South Southwest	202.5	Yes	57.8	43.2	90	50	25
7/07/2011	85	38	0.0	West Northwest	292.5	No	82.2	44.0	90	50	25
13/07/2011	131	67	0.0	West Northwest	292.5	Yes	74.5	43.9	90	50	25
19/07/2011	51	27	11.0	West	270	No	72.5	44.9	90	50	25
31/07/2011	65	79	0.0	North West	270	Yes	84.2	45.3	90	50	25
2/08/2011	143	67			315		98.3	45.8	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
6/08/2011	183	76	0.0	North West	315	Yes	102.8	44.9	90	50	25
12/08/2011	134	20	2.6	South Southeast	157.5	No	100.1	44.8	90	50	25
18/08/2011	78	25	4.8	West Northwest	292.5	Yes	105.1	45.0	90	50	25
24/08/2011	150	43	0.0	East Northeast	67.5	Yes	109.4	45.0	90	50	25
30/08/2011	153	35	0.0	South Southwest	202.5	Yes	117.6	45.1	90	50	25
5/09/2011	207	39	0.0	East Northeast	67.5	Yes	114.6	44.7	90	50	25
11/09/2011	79	28	0.0	North West	315	Yes	113.5	43.8	90	50	25
17/09/2011	100	48	0.0	North West	315	No	132.9	46.2	90	50	25
23/09/2011	405	161	0.0	North West	315	Yes	132.7	46.5	90	50	25
29/09/2011	129	55	30.0	North West	315	No	128.1	46.7	90	50	25
5/10/2011	55	31	0.0	South East	135	Yes	128.6	47.1	90	50	25
11/10/2011	136	57	0.0	South East	135	No	127.9	47.2	90	50	25
17/10/2011	115	35	2.0	South to Southeast	146.25	Yes	125.5	47.0	90	50	25
23/10/2011	82	39	0.0	North East	45	No	126.3	47.4	90	50	25
29/10/2011	141	37	0.0	North Northwest	337.5	No	125.4	47.6	90	50	25
4/11/2011	106	43	0.0	South East	135	Yes	133.5	48.5	90	50	25
10/11/2011	312	83	0.0	NorthWest	315	No	135.9	48.8	90	50	25
16/11/2011	192	56	20.5	South West	225	Yes	132.3	48.7	90	50	25
22/11/2011	45	27	41.8	South West	225	Yes	130.0	48.0	90	50	25
28/11/2011	72	29	0.0	East	90	Yes	129.8	48.1	90	50	25
4/12/2011	126	43	4.0	South Southwest	202.5	Yes	128.4	47.8	90	50	25
10/12/2011	89	36	0.0	South East	135	Yes	126.6	48.2	90	50	25
16/12/2011	77	30	0.0	South Southeast	157.5	No	123.9	47.8	90	50	25
22/12/2011	46	27	1.0	South East	135	Yes	122.3	47.9	90	50	25
28/12/2011	74	28	0.0	South Southwest	202.5	No	122.0	47.7	90	50	25
3/01/2012	112	35	0.0	East Northeast	67.5	No	137.3	49.6	90	50	25
11/01/2012	628	142	0.0	West Northwest	292.5	No	135.0	49.1	90	50	25
15/01/2012	61	27	19.0	East	90	No	132.9	48.9	90	50	25
21/01/2012	61	30	0.0	South Southeast	157.5	No	131.0	48.8	90	50	25
27/01/2012	65	40	2.5	East Southeast	112.5	Yes	128.7	46.4	90	50	25
2/02/2012	44	30	77.0	South Southwest	202.5	Yes	127.3	46.5	90	50	25
8/02/2012	76	34	4.0	South Southeast	157.5	Yes	125.0	46.4	90	50	25
14/02/2012	39	16	0.5	South Southeast	157.5	Yes	123.1	46.1	90	50	25
20/02/2012	48	24	18.5	South	180	Yes	121.9	45.7	90	50	25
26/02/2012	74	30	0.0	East Northeast	67.5	No	123.0	45.8	90	50	25
3/03/2012	165	50	5.0	East Northeast	67.5	No	122.3	45.4	90	50	25
9/03/2012	93	27	0.0	North West	315	No	123.1	46.2	90	50	25
15/03/2012	161	77	0.0	East Northeast	67.5	Yes	122.1	46.3	90	50	25
21/03/2012	77	33	0.0	East Northeast	67.5	Yes	121.5	46.6	90	50	25
27/03/2012	94	34	0.0	East Northeast/ East SouthEast	112.5	No	121.4	46.8	90	50	25
2/04/2012	115	40	0.0	North West/ South East	135	No	122.8	47.0	90	50	25
8/04/2012	193	64	22.0	East	90	No	121.9	41.9	90	50	25
14/04/2012	78	31	0.0	East Northeast	67.5	No	121.2	41.6	90	50	25
20/04/2012	84	31	0.0	North West	315	Yes	123.5	42.3	90	50	25
26/04/2012	242	56	0.0	North West	315	Yes	122.4	42.2	90	50	25
2/05/2012	64	26	0.0	North Northwest	337.5	No	123.2	42.6	90	50	25
8/05/2012	165	51	0.0	NorthWest	315	No	127.0	43.0	90	50	25
14/05/2012	330	44	0.0	West	270	Yes	125.9	42.8	90	50	25
20/05/2012	67	27	0.0	NorthWest	315	Yes	127.8	42.6	90	50	25
26/05/2012	230	28	0.0	NorthWest	315	No	127.0	42.8	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
1/06/2012	80	29	3.0	East Southeast	112.5	Yes	125.8	42.6	90	50	25
7/06/2012	62	22	15.0	West Southwest	247.5	No	124.4	42.3	90	50	25
13/06/2012	42	10	21.0	South West	225	No	127.6	42.2	90	50	25
19/06/2012	313	36	0.0	Northwest	315	Yes	126.7	42.6	90	50	25
25/06/2012	78	56	0.0	Northwest	315	Yes	127.4	42.6	90	50	25
1/07/2012	165	40	0.0	Northwest	315	Yes	127.9	42.7	90	50	25
7/07/2012	67	22	11.0	Northwest	315	Yes	127.1	42.4	90	50	25
13/07/2012	35	14	16.0	North Northwest	337.5	No	125.9	41.5	90	50	25
19/07/2012	56	14	2.5	West Southwest	247.5	No	126.4	41.6	90	50	25
25/07/2012	78	35	0.0	North Northwest	337.5	No	126.1	40.6	90	50	25
31/07/2012	46	13	3.8	South West	225	No	126.2	40.1	90	50	25
6/08/2012	150	38	0.0	West Northwest	292.5	Yes	124.3	39.2	90	50	25
12/08/2012	65	21	1.0	Southwest	225	Yes	142.1	41.1	90	50	25
18/08/2012	1240	134	0.0	Northwest	315	No	145.7	41.3	90	50	25
24/08/2012	301	40	0.0	Northwest	315	Yes	148.8	41.8	90	50	25
30/08/2012	342	72	0.0	Northwest	315	No	151.9	42.9	90	50	25
5/09/2012	342	105	0.0	North Northwest	337.5	Yes	150.3	43.0	90	50	25
11/09/2012	110	48	0.0	South	180	No	151.1	43.3	90	50	25
17/09/2012	129	46	0.5	South	180	Yes	151.4	43.2	90	50	25
23/09/2012	120	38	0.0	Northwest	315	No	153.6	41.7	90	50	25
29/09/2012	539	74	0.0	Northwest	315	Yes	155.5	41.9	90	50	25
5/10/2012	246	64	0.0	NorthWest	315	No	155.7	41.8	90	50	25
11/10/2012	71	24	4.0	North West	315	Yes	156.1	41.8	90	50	25
17/10/2012	158	62	0.0	South East	145	Yes	156.0	41.9	90	50	25
23/10/2012	108	38	0.0	South	180	Yes	156.9	41.8	90	50	25
29/10/2012	137	34	0.0	East	90	Yes	155.5	41.8	90	50	25
4/11/2012	58	34	0.0	East	93	No	154.6	41.6	90	50	25
10/11/2012	50	32	1.0	South	173	Yes	150.5	40.7	90	50	25
16/11/2012	53	31	9.5	South Southeast	167	Yes	148.8	40.4	90	50	25
22/11/2012	90	36	0.0	South	182	Yes	148.7	40.3	90	50	25
28/11/2012	37	17	5.5	South Southeast	161	Yes	148.6	40.3	90	50	25
4/12/2012	67	29	0.0	South East	145	No	147.1	39.7	90	50	25
10/12/2012	33	11	68.5	South Southwest	202.5	No	148.1	40.1	90	50	25
16/12/2012	150	57	0.0	East	90	Yes	148.2	40.1	90	50	25
22/12/2012	83	31	0.5	South East	145	No	148.7	40.3	90	50	25
28/12/2012	77	40	0.5	South Southwest	202.5	No	148.5	40.3	90	50	25
3/01/2013	64	25	0.0	South	183	No	148.2	40.5	90	50	25
9/01/2013	90	52	0.0	South	175	Yes	138.9	38.8	90	50	25
15/01/2013	51	32	0.0	South	127	No	139.2	38.9	90	50	25
21/01/2013	81	39	9.0	South East	138	No	138.9	38.9	90	50	25
27/01/2013	46	29	2.5	North East	50	No	138.7	38.5	90	50	25
2/02/2013	47	15	41.0	South West	217	Yes	141.0	38.9	90	50	25
8/02/2013	190	52	0.0	East Northeast	59	Yes	140.9	38.7	90	50	25
14/02/2013	67	23	0.0	South East	133	No	141.2	38.9	90	50	25
20/02/2013	59	25	0.0	South East	143	Yes	142.7	39.3	90	50	25
26/02/2013	ND	50	0.0	East	87	Yes	143.8	39.2	90	50	25
4/03/2013	ND	26	0.0	South East	129.5	Yes	143.2	39.1	90	50	25
10/03/2013	125	42	0.0	East Northeast	75.9	Yes	144.0	39.2	90	50	25
16/03/2013	ND	37	3.6	North	0	Yes	143.0	38.7	90	50	25
22/03/2013	98	46	0.0	North West	311.9	No	142.7	38.7	90	50	25
28/03/2013	63	28	11.3	East Northeast	58.2	No	142.0	38.5	90	50	25
3/04/2013	50	24	25.0	South	169.6	No	141.0	38.2	90	50	25
9/04/2013	59	23	15.0	West Southwest	238.1	No	139.6	38.1	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
15/04/2013	110	56	0.5	North Northwest	341.9	No	138.9	37.9	90	50	25
21/04/2013	37	15	0.0	West Southwest	249.9	No	138.8	38.0	90	50	25
27/04/2013	75	39	0.0	North West	324.4	Yes	137.0	37.7	90	50	25
3/05/2013	94	36	0.0	North West	320.2	No	137.5	37.8	90	50	25
9/05/2013	64	36	0.0	North West	312	No	135.8	37.4	90	50	25
15/05/2013	43	23	0.0	North West	315.5	No	130.8	37.3	90	50	25
21/05/2013	31	39	0.0	North West	315.8	Yes	130.2	37.3	90	50	25
27/05/2013	42	26	6.5	North West	316.9	No	127.0	37.1	90	50	25
2/06/2013	29	16	16.5	West Southwest	251.9	Yes	126.1	37.0	90	50	25
8/06/2013	62	24	6.0	South West	236.1	Yes	126.1	37.2	90	50	25
14/06/2013	50	32	0.0	North West	313.8	Yes	126.2	37.2	90	50	25
20/06/2013	24	13	3.5	West Southwest	255.2	No	121.2	37.0	90	50	25
26/06/2013	38	24	4.0	South	169.1	Yes	120.6	36.5	90	50	25
2/07/2013	24	21	0.0	South West	236	Yes	118.1	36.2	90	50	25
8/07/2013	69	21	0.0	North West	316	Yes	118.2	36.2	90	50	25
14/07/2013	46	26	0.0	North North West	334	No	118.4	36.3	90	50	25
20/07/2013	36	16	0.0	North West	317	No	118.0	36.9	90	50	25
26/07/2013	120	53	0.0	North West	320	No	118.7	36.7	90	50	25
1/08/2013	66	25	0.0	West Southwest	241	No	119.1	37.0	90	50	25
7/08/2013	72	28	11.3	South Southeast	161	Yes	117.7	36.9	90	50	25
13/08/2013	74	33	0.0	North West	306	Yes	117.9	37.6	90	50	25
19/08/2013	98	67	0.0	North West	311	Yes	98.2	36.5	90	50	25
25/08/2013	140	63	0.0	North North-West	342	Yes	95.4	36.5	90	50	25
31/08/2013	80	42	0.0	North West	318	Yes	90.9	36.2	90	50	25
6/09/2013	90	55	0.0	North West	316	No	86.5	35.3	90	50	25
12/09/2013	92	47	0.0	North North-West	333	Yes	86.2	35.0	90	50	25
18/09/2013	46	29	0.0	North West	321	Yes	84.8	35.5	90	50	25
24/09/2013	130	78	0.0	North	0	No	85.0	35.8	90	50	25
30/09/2013	97	58	0.0	North North-West	339	No	77.4	35.2	90	50	25
6/10/2013	76	34	0.0	North West	315	Yes	74.4	35.0	90	50	25
12/10/2013	93	53	0.0	East	90	No	74.8	35.8	90	50	25
18/10/2013	120	72	0.0	South East	134	No	74.2	35.9	90	50	25
24/10/2013	98	65	0.0	West North West	292	Yes	74.0	35.6	90	50	25
30/10/2013	58	22	0.0	South South West	202	No	72.6	35.5	90	50	25
5/11/2013	60	29	0.0	South	177	No	72.7	35.3	90	50	25
11/11/2013	46	18	27.5	South Southwest	204	Yes	72.6	34.9	90	50	25
17/11/2013	28	8	126.3	West Southwest	245	No	72.2	34.8	90	50	25
23/11/2013	54	25	18.0	North East	35	No	71.5	34.6	90	50	25
29/11/2013	55	28	55.0	South Southwest	194	No	71.8	34.9	90	50	25
5/12/2013	57	30	2.0	West North West	293	No	71.7	35.1	90	50	25
11/12/2013	83	42	0.0	East South East	118	Yes	72.5	35.3	90	50	25
17/12/2013	52	25	0.0	East	90	No	70.8	35.3	90	50	25
23/12/2013	110	55	0.0	North East	45	No	71.3	35.6	90	50	25
29/12/2013	110	52	0.0	South South West	206	No	71.9	35.5	90	50	25
4/01/2014	83	43	0.0	South West	219	Yes	72.2	35.8	90	50	25
10/01/2014	58	27	0.0	East	84	No	71.7	35.4	90	50	25
16/01/2014	59	35	0.0	East	92	No	71.8	35.5	90	50	25
22/01/2014	42	28	0.0	South South East	161	No	71.1	35.3	90	50	25
28/01/2014	51	28	0.0	North East	51	No	71.2	35.3	90	50	25
3/02/2014	93	40	0.0	East	86	Yes	72.0	35.7	90	50	25
9/02/2014	82	29	0.0	East	87	No	70.1	35.3	90	50	25
15/02/2014	53	24	2.0	North-north east	15	No	69.9	35.3	90	50	25
21/02/2014	56	31	0.0	South	173	Yes	69.8	35.4	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
27/02/2014	53	23	126.3	South	185	No	69.6	35.0	90	50	25
5/03/2014	45	25	18.0	East	99	No	69.2	35.0	90	50	25
11/03/2014	65	41	0.0	East-north-east	76	No	68.2	34.9	90	50	25
17/03/2014	51	26	0.0	West-north-west	283	Yes	67.9	34.8	90	50	25
23/03/2014	62	41	4.5	south-west	227	No	67.3	34.7	90	50	25
29/03/2014	38	23	23.2	West-north-west	302	No	66.9	34.6	90	50	25
4/04/2014	43	26	51.8	South West	225	Yes	66.8	34.6	90	50	25
10/04/2014	84	49	0.0	East North East	68	No	67.2	35.0	90	50	25
16/04/2014	30	14	16.8	West South West	242	Yes	65.9	34.4	90	50	25
22/04/2014	85	50	0.0	North West	309	No	66.6	34.9	90	50	25
28/04/2014	53	30	4.3	North East	45	Yes	66.3	34.8	90	50	25
4/05/2014	20	9	6.5	North west	303	Yes	65.1	34.3	90	50	25
10/05/2014	49	33	0.0	North-north-west	232	Yes	64.8	34.3	90	50	25
16/05/2014	63	40	0.0	North-north-west	327	No	65.1	34.6	90	50	25
22/05/2014	88	52	0.0	North-north-west	320	No	66.1	34.8	90	50	25
28/05/2014	53	28	0.0	North west	322	No	66.3	34.8	90	50	25
3/06/2014	29	17	0.0	North west	314	No	66.3	34.8	90	50	25
9/06/2014	28	19	8.8	North west	312	Yes	65.7	34.8	90	50	25
15/06/2014	19	7	0.0	North west	312	Yes	65.2	34.3	90	50	25
21/06/2014	45	29	0.0	North west	323	No	65.5	34.6	90	50	25
27/06/2014	64	31	0.0	North west	305	No	66.0	34.7	90	50	25
3/07/2014	63	41	0.0	North North West	334	Yes	66.6	35.0	90	50	25
9/07/2014	77	47	0.0	North North West	311	No	66.7	35.5	90	50	25
15/07/2014	51	35	2.0	North North West	0	No	66.8	35.6	90	50	25
21/07/2014	41	20	0.0	West South West	248	Yes	66.9	35.7	90	50	25
27/07/2014	33	21	0.0	North West	304	Yes	65.5	35.2	90	50	25
2/08/2014	34	17	3.0	south-west	214	Yes	65.0	35.0	90	50	25
8/08/2014	53	29	0.0	North-north-west	324	Yes	64.6	35.0	90	50	25
14/08/2014	37	21	0.0	South	187	No	64.0	34.9	90	50	25
20/08/2014	24	12	26.5	South-west	230	No	62.8	34.0	90	50	25
26/08/2014	30	31	16.5	South-east	199	Yes	61.0	33.4	90	50	25
1/09/2014	55	36	0.0	North-North-West	338	No	60.6	33.3	90	50	25
7/09/2014	26	12	9.5	South-South-East	158	No	59.6	32.6	90	50	25
13/09/2014	41	24	0.0	East-north-east	68	Yes	58.7	32.2	90	50	25
19/09/2014	72	38	0.0	North-west	315	Yes	59.1	32.4	90	50	25
25/09/2014	49	26	2.5	South-west	225	Yes	57.8	31.5	90	50	25
1/10/2014	105	39	0.0	South	180	No	58.0	31.2	90	50	25
7/10/2014	93	43	0.0	North-North-West & South Eas	337.5	No	58.2	31.4	90	50	25
13/10/2014	83	40	6.0	North-North-West	337.5	Yes	58.1	31.2	90	50	25
19/10/2014	87	45	0.0	East	90	No	57.5	30.7	90	50	25
25/10/2014	64	37	0.5	South	180	No	57.0	30.3	90	50	25
31/10/2014	140	81	0.0	North-North-West	337.5	Yes	58.3	31.2	90	50	25
6/11/2014	68	35	36.5	South	180	Yes	58.4	31.3	90	50	25
12/11/2014	56	40	0.0	East	90	Yes	58.6	31.7	90	50	25
18/11/2014	63	37	0.0	South-South-East	158	No	59.2	32.2	90	50	25
24/11/2014	65	45	1.5	South-South-East	158	Yes	59.4	32.5	90	50	25
30/11/2014	65	43	0.1	East	90	No	59.5	32.7	90	50	25
6/12/2014	47	28	0.5	South-East	135	Yes	59.4	32.7	90	50	25
12/12/2014	50	31	0.5	South	180	Yes	58.8	32.5	90	50	25
18/12/2014	95	64	0.0	East	90	Yes	59.5	33.2	90	50	25
24/12/2014	73	43	0.5	South-South-West	203	No	58.9	33.0	90	50	25
30/12/2014	97	58	0.0	South-East	135	No	58.7	33.1	90	50	25
5/01/2015	47	42	0.0	South	180	No	58.1	33.0	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
11/01/2015	18	9	13.5	South-South-West	203	No	57.5	32.8	90	50	25
17/01/2015	47	32	0.0	North West	315	No	57.3	32.7	90	50	25
23/01/2015	79	48	0.0	East	90	Yes	57.9	33.0	90	50	25
29/01/2015	33	17	0.0	South West	225	No	57.6	32.9	90	50	25
4/02/2015	45	29	0.5	South South East	158	Yes	56.8	32.7	90	50	25
10/02/2015	63	36	1.0	East	90	Yes	56.5	32.8	90	50	25
16/02/2015	61	54	4.0	East	90	Yes	56.6	33.3	90	50	25
22/02/2015	22	14	ND	ND	ND	Yes	56.0	33.0	90	50	25
28/02/2015	62	36	ND	ND	ND	No	56.2	33.2	90	50	25
6/03/2015	115	54	0.0	West South West	248	No	57.3	33.7	90	50	25
12/03/2015	65	43	0.0	South South East	158	Yes	57.3	33.7	90	50	25
18/03/2015	78	49	0.0	North	0	Yes	57.8	34.1	90	50	25
24/03/2015	59	33	46.5	South	180	No	57.7	34.0	90	50	25
30/03/2015	60	31	13.3	North North East	23	No	58.1	34.1	90	50	25
5/04/2015	27	15	1.0	South	180	No	57.8	33.9	90	50	25
11/04/2015	35	15	0.0	South South West	158	No	57.0	33.4	90	50	25
17/04/2015	47	26	0.0	South	180	No	57.3	33.6	90	50	25
23/04/2015	36	17	0.0	West South West	248	Yes	56.5	33.0	90	50	25
29/04/2015	20	11	0.0	South	180	No	56.0	32.7	90	50	25
5/05/2015	51	32	0.2	West	270	No	56.5	33.1	90	50	25
11/05/2015	38	32	0.0	South West	225	Yes	56.3	33.1	90	50	25
17/05/2015	43	21	26.2	West South West	248	Yes	56.0	32.8	90	50	25
23/05/2015	35	31	22.6	South	180	Yes	55.1	32.4	90	50	25
29/05/2015	45	21	0.0	North West	315	No	55.0	32.3	90	50	25
4/06/2015	59	26	0.5	West South West	248	Yes	55.5	32.4	90	50	25
10/06/2015	41	18	0.0	South	180	No	55.7	32.4	90	50	25
16/06/2015	44	21	0.0	North North West	338	Yes	56.1	32.7	90	50	25
22/06/2015	53	29	0.0	South West	225	Yes	56.2	32.7	90	50	25
28/06/2015	57	24	2.0	West South West	248	Yes	56.1	32.5	90	50	25
4/07/2015	50	20	0.0	West South West	248	No	55.9	32.2	90	50	25
10/07/2015	71	30	0.5	North West	304	Yes	55.8	31.9	90	50	25
16/07/2015	36	18	0.5	South West	225	No	55.5	31.6	90	50	25
22/07/2015	110	39	0.0	West	270	Yes	56.7	32.0	90	50	25
28/07/2015	34	16	0.5	West South West	248	Yes	56.7	31.9	90	50	25
3/08/2015	49	27	0.0	West South West	248	No	56.9	32.0	90	50	25
9/08/2015	49	28	0.0	West South West	248	No	56.9	32.0	90	50	25
15/08/2015	48	19	0.0	West South West	248	No	57.0	32.0	90	50	25
21/08/2015	88	42	0.0	North West	315	Yes	58.1	32.5	90	50	25
27/08/2015	27	15	0.0	West North West	293	No	58.0	32.2	90	50	25
2/09/2015	60	27	0	West North West	293	No	58.1	32.1	90	50	25
8/09/2015	26	8	0	West	270	Yes	58.1	32.0	90	50	25
14/09/2015	81	27	0	North East	45	No	58.8	32.0	90	50	25
20/09/2015	46	27	28.6	East North East	68	Yes	58.4	31.9	90	50	25
26/09/2015	24	9	5.4	South West	225	No	58.0	31.6	90	50	25
2/10/2015	60	23	0.0	East South East	113	No	57.2	31.3	90	50	25
8/10/2015	85	37	0.0	East North East	68	No	57.1	31.2	90	50	25
14/10/2015	43	21	0.4	East North East	68	No	56.4	30.9	90	50	25
20/10/2015	85	61	0.0	East North East	68	Yes	56.4	31.2	90	50	25
26/10/2015	65	30	0.0	North West	315	Yes	55.0	30.2	90	50	25
1/11/2015	48	30	0.0	East North East	68	No	54.7	30.2	90	50	25
7/11/2015	39	24	2.0	East South East & South South East	113	Yes	54.4	29.9	90	50	25
13/11/2015	39	23	3.0	North West	315	No	54.0	29.7	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
19/11/2015	120	64	0.0	East & East South East	90	Yes	54.9	30.0	90	50	25
25/11/2015	87	48	0.0	East North East	68	No	55.3	30.1	90	50	25
1/12/2015	105	47	0.0	North West	0	No	56.3	30.4	90	50	25
7/12/2015	270	20	0.0	East	90	No	59.9	30.2	90	50	25
13/12/2015	73	43	0.0	East North East	68	Yes	59.6	29.8	90	50	25
19/12/2015	51	36	0.0	East North East	68	No	59.2	29.7	90	50	25
25/12/2015	37	14	0.0	East South East	113	Yes	58.2	29.0	90	50	25
31/12/2015	50	25	0.0	East	90	No	58.0	28.9	90	50	25
6/01/2016	36	24	216.3	South	180	Yes	57.9	28.6	90	50	25
12/01/2016	94	45	1.5	South	180	No	59.1	29.2	90	50	25
18/01/2016	49	21	4.2	South East	135	Yes	59.1	29.0	90	50	25
24/01/2016	50	32	0.6	South South East	158	No	58.7	28.8	90	50	25
30/01/2016	59	36	0.0	East South East	113	Yes	59.1	29.1	90	50	25
5/02/2016	34	17	2.0	South South East	158	Yes	58.9	28.9	90	50	25
11/02/2016	58	46	0.0	East North East	68	Yes	58.8	29.0	90	50	25
17/02/2016	71	28	6.0	South	180	Yes	59.0	28.6	90	50	25
23/02/2016	44	26	0.0	North East	45	No	59.4	28.8	90	50	25
29/02/2016	56	27	0.0	South East	135	No	59.3	28.7	90	50	25
6/03/2016	63	38	0.0	East North East	68	Yes	58.4	28.4	90	50	25
12/03/2016	49	51	0.0	East North East	68	Yes	58.1	28.5	90	50	25
18/03/2016	52	31	0.0	North West	315	Yes	57.7	28.2	90	50	25
24/03/2016	65	40	0.0	North West	315	No	57.8	28.4	90	50	25
30/03/2016	44	33	3.4	West North West	293	No	57.6	28.4	90	50	25
5/04/2016	53	31	0.0	North East	45	Yes	58.0	28.7	90	50	25
11/04/2016	87	41	0.0	South East	135	Yes	58.8	29.1	90	50	25
17/04/2016	44	20	22.0	South West	225	Yes	58.8	29.0	90	50	25
23/04/2016	46	19	0.0	South South East	158	No	59.0	29.0	90	50	25
29/04/2016	51	28	0.0	North North East	23	No	59.5	29.3	90	50	25
5/05/2016	110	38	0.0	North West	315	No	60.4	29.4	90	50	25
11/05/2016	62	22	0.0	West North West	293	No	60.8	29.2	90	50	25
17/05/2016	86	39	0.0	North West	315	Yes	61.5	29.5	90	50	25
23/05/2016	83	40	0.0	North West	315	No	62.3	29.7	90	50	25
29/05/2016	27	5	0.2	West North West	293	No	62.0	29.4	90	50	25
4/06/2016	52	23	40.0	North East	45	No	61.9	29.4	90	50	25
10/06/2016	61	18	0.0	West North West	293	Yes	62.2	29.4	90	50	25
16/06/2016	140	35	0.0	North West	315	Yes	63.8	29.6	90	50	25
22/06/2016	40	25	0.0	West North West	293	No	63.6	29.5	90	50	25
28/06/2016	85	30	0.0	West	270	Yes	64.0	29.6	90	50	25
4/07/2016	89	42	0.0	North West	315	No	64.7	30.0	90	50	25
10/07/2016	78	27	0.0	West North West	292.5	Yes	64.8	29.9	90	50	25
16/07/2016	72	24	4.0	North West	315	Yes	65.4	30.0	90	50	25
22/07/2016	48	23	0.0	North West	315	No	64.4	29.8	90	50	25
28/07/2016	54	11	0.0	West North West	292.5	Yes	64.7	29.7	90	50	25
3/08/2016	50	17	3.0	South South East	158	No	64.7	29.5	90	50	25
9/08/2016	67	26	0.0	North West	315	Yes	65.0	29.5	90	50	25
15/08/2016	71	32	0.0	North West	315	No	65.4	29.7	90	50	25
21/08/2016	67	25	0.0	West North West	293	Yes	65.0	29.4	90	50	25
27/08/2016	53	18	1.0	South West	225	No	65.5	29.5	90	50	25
2/09/2016	40	23	29.8	North East	45	Yes	65.1	29.4	90	50	25
8/09/2016	58	26	0.0	North North East	23	No	65.7	29.7	90	50	25
14/09/2016	43	29	17.5	North West	315	No	65.0	29.7	90	50	25
20/09/2016	125	24	0.0	West North West	293	No	66.3	29.7	90	50	25
26/09/2016	52	16	0.0	West North West	293	No	66.8	29.8	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
2/10/2016	40	27	0.0	West North West	293	Yes	66.5	29.9	90	50	25
8/10/2016	57	34	1.0	South South East	158	No	66.0	29.8	90	50	25
14/10/2016	72	23	2.5	West	270	Yes	66.5	29.9	90	50	25
20/10/2016	53	38	0.0	East North East	68	Yes	66.0	29.5	90	50	25
26/10/2016	110	49	0.0	North West	315	No	66.7	29.8	90	50	25
1/11/2016	58	25	0.0	South West	225	Yes	66.9	29.7	90	50	25
7/11/2016	150	115	0.0	North West	315	No	68.7	31.2	90	50	25
13/11/2016	41	31	0.0	West	270	Yes	68.7	31.3	90	50	25
19/11/2016	60	45	0.0	South	180	Yes	67.7	31.0	90	50	25
25/11/2016	61	29	0.0	South East	135	No	67.3	30.7	90	50	25
1/12/2016	72	40	0.0	East North East	68	No	66.8	30.6	90	50	25
7/12/2016	51	22	15.0	North East	45	No	63.2	30.6	90	50	25
13/12/2016	120	55	0.0	North West	315	Yes	64.0	30.8	90	50	25
19/12/2016	60	33	0.0	East	90	Yes	64.1	30.8	90	50	25
25/12/2016	48	28	0.5	East North East	68	No	64.3	31.0	90	50	25
31/12/2016	88	52	0.0	South	180	Yes	64.9	31.4	90	50	25
6/01/2017	33	30	0.0	East South East	113	Yes	64.9	31.5	90	50	25
12/01/2017	66	33	0.0	East North East	68	No	64.4	31.3	90	50	25
18/01/2017	150	71	0.0	South South East	158	Yes	66.0	32.2	90	50	25
24/01/2017	120	62	55.5	South	180	Yes	67.2	32.7	90	50	25
30/01/2017	78	39	0.0	East North East	68	No	67.5	32.7	90	50	25
5/02/2017	74	48	0.0	East North East	68	No	68.2	33.2	90	50	25
11/02/2017	74	44	0.0	South South West	203	No	68.4	33.2	90	50	25
17/02/2017	76	46	11.3	North North East	23	Yes	68.5	33.5	90	50	25
23/02/2017	86	25	0.0	East North East	68	Yes	69.2	33.5	90	50	25
1/03/2017	53	26	1.0	East South East	113	Yes	69.1	33.4	90	50	25
7/03/2017	35	15	20.8	South West	225	No	68.7	33.1	90	50	25
13/03/2017	115	45	0.0	North East	45	No	69.8	33.0	90	50	25
19/03/2017	63	33	3.5	East North East	68	No	70.0	33.0	90	50	25
25/03/2017	68	47	0.0	East North East	68	Yes	70.0	33.1	90	50	25
31/03/2017	42	16	11.5	South South West	202.5	Yes	70.0	32.8	90	50	25
6/04/2017	50	20	5.5	South East	135	No	69.9	32.7	90	50	25
12/04/2017	28	15	52.0	South West	225	Yes	69.0	32.2	90	50	25
18/04/2017	64	28	0.0	South East	135	No	69.3	32.4	90	50	25
24/04/2017	64	40	0.0	North West	315	Yes	69.6	32.7	90	50	25
30/04/2017	46	26	0.0	North West	315	No	69.5	32.7	90	50	25
6/05/2017	75	39	0.0	North West	315	No	68.9	32.7	90	50	25
12/05/2017	52	25	1.0	South West	225	No	68.8	32.7	90	50	25
18/05/2017	135	66	0.0	East North East	68	Yes	69.6	33.2	90	50	25
24/05/2017	49	30	1.5	North West	315	Yes	69.0	33.0	90	50	25
30/05/2017	76	35	0.0	West North West	293	Yes	69.8	33.5	90	50	25
5/06/2017	66	36	0.0	North West	315	Yes	70.0	33.7	90	50	25
11/06/2017	27	14	0.0	South West	225	Yes	69.5	33.7	90	50	25
17/06/2017	41	25	1.0	South West	225	Yes	67.9	33.5	90	50	25
23/06/2017	54	29	0.0	North West	315	No	68.1	33.6	90	50	25
29/06/2017	20	11	2.5	West	270	No	67.0	33.2	90	50	25
5/07/2017	51	25	0.0	West North West	293	Yes	66.4	33.0	90	50	25
11/07/2017	58	23	20.5	West North West	293	No	66.1	32.9	90	50	25
17/07/2017	53	23	0.0	North West	315	No	65.8	32.9	90	50	25
23/07/2017	38	10	0.0	West North West	293	Yes	65.6	32.7	90	50	25
29/07/2017	79	26	0.0	West North West	293	Yes	66.0	32.9	90	50	25
4/08/2017	28	30	0.5	West North West	293	No	65.6	33.1	90	50	25
10/08/2017	91	41	0.0	North West	315	Yes	66.0	33.4	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
16/08/2017	83	41	0.0	West North West	293	Yes	66.2	33.5	90	50	25
22/08/2017	63	32	0.0	South East	135	Yes	66.2	33.6	90	50	25
28/08/2017	37	15	0.0	South West	225	No	65.9	33.6	90	50	25
3/09/2017	84	44	0.0	North West	315	No	66.6	33.9	90	50	25
9/09/2017	45	14	0.0	West	270	Yes	66.4	33.7	90	50	25
15/09/2017	33	15	0.0	West North West	293	Yes	66.2	33.5	90	50	25
21/09/2017	70	46	0.0	North West	315	Yes	65.3	33.9	90	50	25
27/09/2017	69	38	0.0	North East	45	Yes	65.6	34.2	90	50	25
3/10/2017	69	28	0.5	North East	45	Yes	66.1	34.2	90	50	25
9/10/2017	65	36	1.5	North West	315	No	66.2	34.3	90	50	25
15/10/2017	54	33	14.8	East	90	Yes	65.9	34.4	90	50	25
21/10/2017	61	21	1.0	South	180	Yes	66.1	34.2	90	50	25
31/10/2017	38	21	0.5	South West	225	No	64.9	33.7	90	50	25
2/11/2017	57	27	0.0	East	68	No	64.9	33.7	90	50	25
8/11/2017	23	16	42.0	East North East	113	Yes	62.8	32.1	90	50	25
14/11/2017	53	24	0.0	South West	225	Yes	63.0	32.0	90	50	25
20/11/2017	47	25	1.0	East South East	113	Yes	62.8	31.7	90	50	25
26/11/2017	56	43	0.0	East North East	68	Yes	62.7	31.9	90	50	25
2/12/2017	64	38	15.5	East	270	Yes	62.6	31.9	90	50	25
8/12/2017	75	49	0	South east	68	Yes	63.0	32.3	90	50	25
14/12/2017	135	83	0	East north east	68	Yes	63.2	32.8	90	50	25
20/12/2017	160	73	2	North west	315	Yes	64.8	33.4	90	50	25
26/12/2017	45	32	0	East south east	293	Yes	64.8	33.5	90	50	25
1/01/2018	57	33	0	South east	135	Yes	64.3	33.2	90	50	25
7/01/2018	110	47	0	North west	315	Yes	65.5	33.5	90	50	25
13/01/2018	120	54	6.5	South south east	158	Yes	66.4	33.8	90	50	25
19/01/2018	83	31	0	East north east	68	Yes	65.3	33.1	90	50	25
25/01/2018	65	26	0	East north east	68	Yes	64.4	32.6	90	50	25
31/01/2018	39	23	1.5	South	180	No	63.8	32.3	90	50	25
6/02/2018	49	24	0	North East	45	Yes	63.4	31.9	90	50	25
12/02/2018	63	29	0	East	90	Yes	63.2	31.7	90	50	25
18/02/2018	86	48	0	East North East	68	Yes	63.4	31.7	90	50	25
24/02/2018	71	35	0	East North East	68	Yes	63.1	31.9	90	50	25
2/03/2018	45	27	2.0	South East	45	Yes	63.0	31.9	90	50	25
8/03/2018	19	15	0.0	South East	135	Yes	62.7	31.9	90	50	25
14/03/2018	66	35	0.0	East North East	23	Yes	61.9	31.7	90	50	25
20/03/2018	155	54	0.0	South	180	Yes	63.4	32.0	90	50	25
26/03/2018	51	22	6.0	West North West	225	Yes	63.1	31.6	90	50	25
1/04/2018	68	39	0.0	North West	315	No	63.6	32.0	90	50	25
7/04/2018	62	25	0.0	North West	315	No	63.8	32.1	90	50	25
13/04/2018	97	65	0.0	North West	315	Yes	64.9	32.9	90	50	25
19/04/2018	80	36	31.5	North West	315	Yes	65.2	33.0	90	50	25
25/04/2018	25	11	4.5	South West	225	Yes	64.5	32.6	90	50	25
1/05/2018	71	28	0.0	North West	315	Yes	64.9	32.6	90	50	25
7/05/2018	105	26	0.0	North West	315	Yes	65.4	32.4	90	50	25
13/05/2018	29	9	1.0	South West	225	No	65.0	32.1	90	50	25
19/05/2018	69	28	1.0	West North West	293	No	64.0	31.5	90	50	25
25/05/2018	81	25	1.0	South	180	No	64.5	31.4	90	50	25
31/05/2018	74	20	0.0	West North West	292.5	No	64.5	31.2	90	50	25
6/06/2018	20	10	9.5	South West	225	Yes	63.7	30.8	90	50	25
12/06/2018	33	24	0.5	North West	315	Yes	63.8	30.9	90	50	25
18/06/2018	33	8	34.5	West North West	293	Yes	63.7	30.6	90	50	25
24/06/2018	38	20	0.0	South West	225	Yes	63.4	30.5	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
30/06/2018	59	27	0.0	West North West	292.5	No	64.0	30.8	90	50	25
6/07/2018	46	31	0.0	North West	315	No	64.0	30.9	90	50	25
12/07/2018	53	40	0.0	North West	315	Yes	63.9	31.1	90	50	25
18/07/2018	130	55	0.0	North West	315	No	65.1	31.7	90	50	25
24/07/2018	150	68	0.0	North West	315	Yes	67.0	32.6	90	50	25
30/07/2018	41	21	0.0	West North West	293	No	66.4	32.5	90	50	25
5/08/2018	87	46	0.0	North West	315	No	67.3	32.8	90	50	25
11/08/2018	84	36	0.0	North West	315	Yes	67.2	32.7	90	50	25
17/08/2018	76	33	0.0	West North West	293	No	67.1	32.6	90	50	25
23/08/2018	52	22	0.0	South East	135	No	66.9	32.4	90	50	25
29/08/2018	67	23	0.0	West North West	293	Yes	67.4	32.5	90	50	25
4/09/2018	20	7	0.5	East South East	113	No	66.4	31.9	90	50	25
10/09/2018	63	23	0.0	North West	315	No	66.7	32.1	90	50	25
16/09/2018	35	21	0.0	South South East	158	No	66.7	32.2	90	50	25
22/09/2018	65	35	0.0	North West	315	Yes	66.6	32.0	90	50	25
28/09/2018	66	48	0.0	North West	315	Yes	66.6	32.2	90	50	25
4/10/2018	21	15	12.0	South	180	Yes	65.8	32.0	90	50	25
10/10/2018	49	25	44.8	South South East	158	No	65.5	31.8	90	50	25
16/10/2018	73	42	0.0	North East	45	Yes	65.8	31.9	90	50	25
22/10/2018	39	29	0.5	East North East	68	No	65.5	32.0	90	50	25
28/10/2018	80	32	3.0	South East	135	No	66.1	32.2	90	50	25
3/11/2018	120	45	0.0	South South East	158	No	67.2	32.5	90	50	25
9/11/2018	60	21	0.0	East North East	68	Yes	67.8	32.6	90	50	25
15/11/2018	60	34	2.0	South South East	158	No	67.9	32.8	90	50	25
21/11/2018	110	21	0.0	North West	315	No	68.9	32.7	90	50	25
27/11/2018	100	42	6.5	East North East	68	Yes	69.7	32.7	90	50	25
3/12/2018	120	61	0.0	North West	315	Yes	70.6	33.1	90	50	25
9/12/2018	87	41	0.0	East North East	68	No	70.8	32.9	90	50	25
15/12/2018	89	39	0.2	North East	45	No	70.0	32.2	90	50	25
21/12/2018	63	20	0.0	South	180	No	68.4	31.3	90	50	25
27/12/2018	43	43	0.0	East North East	68	Yes	68.4	31.5	90	50	25
2/01/2019	74	65	0.0	East North East	68	No	68.7	32.0	90	50	25
8/01/2019	59	42	0.0	East North East	68	No	67.8	32.0	90	50	25
14/01/2019	43	31	0.0	East North East	45	No	66.6	31.6	90	50	25
20/01/2019	41		0.0	South	158	No	65.9	31.6	90	50	25
22/01/2019		31	0.0	East North East	68	No	65.9	31.7	90	50	25
26/01/2019	105		0.0	North North West	180	Yes	67.0	31.8	90	50	25
30/01/2019		42	0.0	East North East	68	Yes	67.3	32.1	90	50	25
1/02/2019	80	19	7.0	South	180	Yes	67.6	32.0	90	50	25
7/02/2019	77	38	0.0	East North East	68	Yes	67.4	31.8	90	50	25
13/02/2019	105	45	0.0	South East	135	No	68.0	32.0	90	50	25
19/02/2019	68	46	1.5	South	180	No	68.4	32.3	90	50	25
25/02/2019	63	32	0.0	East South East	113	Yes	69.2	32.6	90	50	25
3/03/2019	74		0.0	East North East	68	No	69.3	32.5	90	50	25
9/03/2019	92	36	6.8	South	18	No	68.2	32.2	90	50	25
12/03/2019		40	0.0	East South East	113	No	68.5	32.5	90	50	25
15/03/2019	70	21	0.0	South	180	Yes	68.6	32.2	90	50	25
21/03/2019	36	16	2.8	South South East	158	Yes	68.1	32.1	90	50	25
27/03/2019	55	32	0.0	East South East	113	Yes	67.4	31.5	90	50	25
2/04/2019	45	11	4.5	South West	225	Yes	66.8	31.1	90	50	25
8/04/2019		46	0.0	North West	315	No	67.5	31.7	90	50	25
9/04/2019	87		1.5	North West	315	No	67.8	31.7	90	50	25
14/04/2019	63	21	2.0	South West	225	Yes	67.1	31.6	90	50	25

Date	24 Hour TSP Concentration (µg/m^3)	24 Hour PM10 Concentration (µg/m^3)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
20/04/2019	56	27	0.0	North East	45	Yes	67.5	32.0	90	50	25
26/04/2019	84	35	0.0	North West	315	No	67.8	32.1	90	50	25
2/05/2019	48	24	0.0	North East	45	Yes	67.2	32.1	90	50	25
8/05/2019	53	20	0.0	West North West	293	No	66.8	32.1	90	50	25
14/05/2019	64	26	0.0	North West	315	Yes	67.6	32.4	90	50	25
20/05/2019	51	32	0.0	North West	315	No	67.9	32.5	90	50	25
26/05/2019	82	39	0.0	North West	315	Yes	68.8	33.0	90	50	25
1/06/2019	50	23	36.0	North West	293	No	69.0	33.1	90	50	25
7/06/2019	58	26	0.0	North West	315	No	69.0	33.1	90	50	25
13/06/2019	69	31	0.0	West North West	293	No	69.4	33.1	90	50	25
19/06/2019	22	12	0.0	South West	225	No	68.8	32.6	90	50	25
25/06/2019	19	10	4.0	South West	225	Yes	66.9	31.8	90	50	25
1/07/2019	67	36	0.0	West-north west	315	Yes	65.4	31.2	90	50	25
7/07/2019	54	22	1.5	North West	293	No	65.7	31.2	90	50	25
13/07/2019	30	6	0.0	West	293	No	64.7	30.5	90	50	25
19/07/2019	97	23	0.0	West-north west	315	Yes	64.9	30.3	90	50	25
25/07/2019	64	27	0.0	North west	315	No	64.7	30.2	90	50	25
31/07/2019	31	5	5.5	South West	225	No	64.3	29.9	90	50	25
6/08/2019	71	28	0.0	North-west		Yes	64.4	30.0	90	50	25
12/08/2019	44	13	0.0	West-North West		No	64.8	30.1	90	50	25
18/08/2019	58	8	0.0	North-North East		No	64.7	29.8	90	50	25
24/08/2019	110	48	0.0	North West		No	66.0	30.3	90	50	25
30/08/2019	19	39	110.0	South West		No	65.2	30.4	90	50	25
5/09/2019	84	61	0.0	East-north east		Yes	65.5	30.6	90	50	25
11/09/2019	47	28	0.5	West-north west		Yes	66.0	30.8	90	50	25
17/09/2019	42	11	17.0	South-south east		No	65.9	30.6	90	50	25
23/09/2019	38	15	0.0	South west		No	65.3	30.1	90	50	25
29/09/2019	54	25	0.0	East-north east		No	65.5	30.1	90	50	25
5/10/2019	58	8	8.3	South east		No	65.1	29.6	90	50	25
11/10/2019	31	18	10.5	East south east		Yes	63.6	29.2	90	50	25
17/10/2019	86	39	0.0	West-south West		Yes	64.0	29.5	90	50	25
23/10/2019	66	7	0.0	East-north east		Yes	64.1	29.0	90	50	25
29/10/2019	110	44	0.0	North-north East		No	64.1	29.4	90	50	25
4/11/2019	50	19	5.5	East south east		No	63.3	29.0	90	50	25
10/11/2019	47	21	0.0	South East		No	62.0	28.3	90	50	25
16/11/2019	84	47	0.0	East south east		No	61.9	28.4	90	50	25
22/11/2019	180	105	1.0	South		No	63.5	29.6	90	50	25
28/11/2019	190	90	0.0	East north east		Yes	65.8	30.8	90	50	25
4/12/2019	160	85	0.0	West North West		No	67.8	31.5	90	50	25
10/12/2019	180	120	0.0	South		No	69.7	32.5	90	50	25
16/12/2019	93	43	0.0	South South East		No	70.3	32.5	90	50	25
22/12/2019	88	45	0.0	South		Yes	71.1	32.8	90	50	25
28/12/2019	74	33	0.0	East North East	68	No	71.6	32.8	90	50	25
3/01/2020	90	36	0.0	East North East	68	No	71.9	32.8	90	50	25
9/01/2020	80	43	0.0	South	180	No	71.5	33.0	90	50	25
15/01/2020	74	35	0.0	South East	135	Yes	71.6	32.9	90	50	25
21/01/2020	110	59	0.0	North West	315	No	72.1	33.6	90	50	25
27/01/2020	83	42	0.0	South	180	No	72.2	33.6	90	50	25
2/02/2020	115	**53**	0.5	South	180	Yes	72.3	33.8	90	50	25
8/02/2020	75	33	5.0	East South East	113	No	72.5	33.6	90	50	25
14/02/2020	54	23	0.0	South	180	No	72.3	33.4	90	50	25
20/02/2020	45	18	0.0	South East	135	No	71.8	33.2	90	50	25
26/02/2020	64	29	7.5	North West	315	No	71.3	33.0	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
3/03/2020	61	23	0.0	South	180	No	71.2	32.8	90	50	25
9/03/2020	27	10	0.5	South East	135	No	70.5	32.6	90	50	25
15/03/2020	28	13	0.5	South South East	158	Yes	70.3	32.5	90	50	25
21/03/2020	79	22	0.0	East South East	113	No	70.7	32.4	90	50	25
27/03/2020	45	26	4.0	East South East	113	Yes	70.7	32.6	90	50	25
2/04/2020	85	2	6.0	North East	45	No	71.0	31.9	90	50	25
8/04/2020	41	9	0.0	South East	135	Yes	70.2	31.5	90	50	25
14/04/2020	69	35	0.0	North West	315	Yes	70.3	31.7	90	50	25
20/04/2020	73	38	0.0	West North West	293	No	70.6	31.9	90	50	25
26/04/2020	105	55	0.0	North West	315	No	70.9	32.2	90	50	25
2/05/2020	58		0.0	West North West	293	No	71.1	32.4	90	50	25
5/05/2020		7	2.5	South West	225	No	71.4	32.2	90	50	25
8/05/2020	74	38	0.0	North West	315	No	71.6	32.4	90	50	25
14/05/2020	40	18	14.0	South West	225	No	71.4	32.1	90	50	25
20/05/2020	54	34	0.0	North West	315	Yes	70.9	32.0	90	50	25
26/05/2020	33	20	8.3	South South East	158	Yes	70.6	32.0	90	50	25
1/06/2020	87	32	0.0	North West	315	Yes	71.1	32.1	90	50	25
7/06/2020	56	31	0.0	West North West	293	No	70.9	32.1	90	50	25
13/06/2020	50	26	0.0	North West	315	Yes	71.4	32.3	90	50	25
19/06/2020	63	31	0.5	North West	315	No	72.1	32.7	90	50	25
25/06/2020	39	20	0.0	West North West	293	Yes	71.6	32.4	90	50	25
1/07/2020	150	39	0.0	North West	315	No	73.2	32.7	90	50	25
7/07/2020	44	23	3.0	West North West	293	No	73.5	33.0	90	50	25
13/07/2020	26	14	0.5	West North West	293	No	72.3	32.8	90	50	25
19/07/2020	39	21	0.0	North West	315	No	71.9	32.7	90	50	25
25/07/2020	48	22	2.0	North North East	23	No	72.1	33.0	90	50	25
31/07/2020	49	21	0.0	South	180	No	71.8	32.9	90	50	25
6/08/2020	47	21	0.0	West North West	293	No	71.8	33.0	90	50	25
12/08/2020	52		0.0	North West	315	No	71.7	33.4	90	50	25
15/08/2020		8	0.5	West North west	293	Yes	71.1	32.8	90	50	25
18/08/2020	46	12	0.0	West North West	293	Yes	71.5	32.3	90	50	25
24/08/2020	44	16	0.0	West	270	No	70.8	31.5	90	50	25
30/08/2020	47		0.0	North West	315	No	70.8	31.6	90	50	25
3/09/2020		23	0.0	North West	315	No	71.3	31.8	90	50	25
5/09/2020	35	24	4.0	West	270	No	71.3	32.0	90	50	25
11/09/2020	45	16	0.0	East south East	113	No	71.1	31.8	90	50	25
17/09/2020	100	34	0.0	North West	315	No	71.9	32.3	90	50	25
23/09/2020	66	49	0.0	West North West	293	Yes	72.5	32.8	90	50	25
29/09/2020	61	23	0.0	East South East	113	No	72.0	32.5	90	50	25
5/10/2020	74		0.0	North West	315	No	72.2	33.0	90	50	25
7/10/2020		30	0.0	East south east	113	Yes	71.5	32.7	90	50	25
11/10/2020	45	21	0.0	North West	315	No	71.4	32.8	90	50	25
17/10/2020	76	32	0.0	North East	45	No	71.9	32.9	90	50	25
23/10/2020	43	19	0.0	North East	45	No	71.2	32.5	90	50	25
29/10/2020	21	8	0.5	South West	225	No	68.4	30.8	90	50	25
4/11/2020	45	19	0.0	East North East	68	No	65.9	29.5	90	50	25
10/11/2020	42	28	0.0	North East	45	Yes	63.8	28.5	90	50	25
16/11/2020	40	14	20.0	North West	315	No	61.4	26.6	90	50	25
22/11/2020	55	30	0.0	North West	315	No	60.7	26.4	90	50	25
28/11/2020	89	50	0.0	North West	315	No	60.7	26.5	90	50	25
4/12/2020	63	33	0.0	South East	135	No	60.5	26.5	90	50	25
10/12/2020	77	37	0.5	South South East	158	No	60.3	26.5	90	50	25
16/12/2020	42	37	0.0	East North East	68	Yes	59.6	26.4	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
22/12/2020	12	8	6.5	West North West	293	No	58.5	25.9	90	50	25
28/12/2020	55	28	15.5	North North West	338	Yes	57.6	25.4	90	50	25
3/01/2021	64	19	11.3	North east	45	No	59.2	26.3	90	50	25
9/01/2021	23	8	9.5	South east	135	Yes	58.2	25.7	90	50	25
15/01/2021	70	36	0.0	South south west	203	No	58.2	25.7	90	50	25
21/01/2021	63	29	0.0	East north east	68	No	57.4	25.2	90	50	25
27/01/2021	44	46	20.5	South	180	No	56.8	25.3	90	50	25
2/02/2021	37	16	11.5	South South East	158	Yes	55.5	24.7	90	50	25
8/02/2021	43	20	0.0	South	180	No	55.0	24.5	90	50	25
14/02/2021	43	31	0.0	South	180	Yes	54.8	24.6	90	50	25
20/02/2021	38	29	1.5	East South East	113	Yes	54.7	24.8	90	50	25
26/02/2021	55	26	0.0	East South East	113	No	54.5	24.8	90	50	25
4/03/2021	68	22	7.5	East North East	68	Yes	54.6	24.7	90	50	25
16/03/2021	23	12	3.5	South West	225	Yes	54.6	25.4	90	50	25
18/03/2021	24	11	12.0	East South East	113	Yes	54.5	25.4	90	50	25
22/03/2021	29	17	0.0	North East	45	Yes	53.7	25.1	90	50	25
28/03/2021	30	15	0.0	South East	135	Yes	53.4	24.7	90	50	25
3/04/2021	33	18	0.0	North North East	23	Yes	52.8	24.7	90	50	25
9/04/2021	46	21	0.5	West North West	293	Yes	52.4	24.0	90	50	25
15/04/2021	79	46	0.0	South West	225	Yes	52.8	24.7	90	50	25
21/04/2021	52	29	0.0	West North West	293	Yes	52.5	24.5	90	50	25
27/04/2021	38	21	0.0	North West	315	Yes	51.7	24.6	90	50	25
3/05/2021	31	15	0.0	North West	315	No	50.9	24.3	90	50	25
9/05/2021	34	29	0.0	West North West	293	Yes	50.5	24.4	90	50	25
15/05/2021	50	6	0.0	West	270	No	50.4	24.2	90	50	25
21/05/2021	46	17	18.5	North West	315	Yes	50.3	23.9	90	50	25
27/05/2021	32	25	0.0	West North West	293	No	50.3	24.0	90	50	25
2/06/2021	63	29	0.0	North West	315	No	49.9	24.0	90	50	25
8/06/2021	52	27	8.8	North West	315	Yes	49.8	23.9	90	50	25
14/06/2021	20	10	0.0	West North West	293	No	49.3	23.6	90	50	25
20/06/2021	18	6	15.0	South West	225	No	48.6	23.2	90	50	25
26/06/2021	22	8	0.0	West North West	293	No	48.3	23.0	90	50	25
2/07/2021	42	26	3.0	North west	315	No	46.6	22.8	90	50	25
8/07/2021	43	19	1.5	North west	315	No	46.5	22.7	90	50	25
14/07/2021	90	46	3.0	North west	315	Yes	47.6	23.3	90	50	25
20/07/2021	44	16	0.0	West	270	No	47.7	23.2	90	50	25
26/07/2021	32	23	0.0	West north West	293	No	47.4	23.2	90	50	25
1/08/2021	82	53	1.0	North west	315	Yes	48.0	23.8	90	50	25
7/08/2021	59	48	0.0	West	270	Yes	48.1	24.2	90	50	25
13/08/2021	69	36	0.0	North west	315	No	48.4	24.4	90	50	25
19/08/2021	75	40	0.0	North west	315	No	48.9	25.1	90	50	25
25/08/2021	15	5	27.0	West	270	No	48.4	24.9	90	50	25
31/08/2021	67	36	0.0	North west	315	No	48.8	25.1	90	50	25
6/09/2021	51	37	0.0	West North West	293	Yes	49.0	25.5	90	50	25
12/09/2021	140	53	0.0	North West	315	Yes	50.6	25.8	90	50	25
18/09/2021	78	40	1.5	West North West	293	No	50.2	25.7	90	50	25
24/09/2021	115	84	0.0	West North West	293	Yes	51.0	26.7	90	50	25
30/09/2021	43	30	0.5	East North East	68	No	50.7	26.7	90	50	25
6/10/2021	73	61	0.0	West North West	293	No	50.7	27.3	90	50	25
12/10/2021	38	2	10.4	East South East	113	Yes	50.6	26.9	90	50	25
18/10/2021	63	13	0.0	North West	315	No	50.4	26.6	90	50	25
24/10/2021	67	20	0.2	West North West	293	Yes	50.8	26.6	90	50	25
30/10/2021	67	31	0.0	North East	45	No	51.5	27.0	90	50	25

Date	24 Hour TSP Concentration ($\mu g/m^3$)	24 Hour PM10 Concentration ($\mu g/m^3$)	Rainfall (mm)	Predominant Wind Direction		Vessel Operating	12 month Rolling Average		Guideline Criteria		
					°		TSP	PM10	TSP Annual Average Criterion	PM10 24 hour "short term" Criterion	PM10 Annual Average Criterion
5/11/2021	84	62	3.4	East North East	68	Yes	52.2	27.7	90	50	25
11/11/2021	20	12	0.0	East North East	68	No	51.8	27.4	90	50	25
17/11/2021	49	19	0.0	South East	135	No	52.0	27.5	90	50	25
23/11/2021	32	11	7.6	South South East	158	No	51.6	27.2	90	50	25
29/11/2021	60	29	0.0	South West	225	No	51.1	26.9	90	50	25
5/12/2021	72	152	0.2	East South East	113	Yes	51.2	28.8	90	50	25
11/12/2021	28	46	0.0	South West	225	No	50.4	29.0	90	50	25
17/12/2021	87	50	0.2	South South East	158	Yes	51.2	29.2	90	50	25
23/12/2021	84	48	0.0	East North East	68	Yes	52.4	29.8	90	50	25
29/12/2021	22	65	1.2	East South East	113	Yes	51.8	30.4	90	50	25
4/01/2022	48	58	0.0	South South East	158	No	51.6	31.1	90	50	25
10/01/2022	61	18	0.2	East North East	68	No	52.2	31.2	90	50	25
16/01/2022	68	43	9.0	South	180	No	52.1	31.4	90	50	25
22/01/2022	46	47	0.4	South East	135	No	51.9	31.7	90	50	25
28/01/2022	48	8	0.0	North East	45	No	51.9	31.0	90	50	25

APPENDIX F – SUPPORTING DPE AIR QUALITY MONITORING REPORTS AND DATA

Daily Averages - PM10 Time Range: 01/08/2021 00:00 to 01/01/2023 00:00						
Initial Data	WALLSEND PM10 1h average	CARRINGTON PM10 1h average	STOCKTON PM10 1h average	NEWCASTLE PM10 1h average	MAYFIELD PM10 1h average	BERESFIELD PM10 1h average
Date	WALLSEND PM10 24h average [µg/m³]	CARRINGTON PM10 24h average [µg/m³]	STOCKTON PM10 24h average [µg/m³]	NEWCASTLE PM10 24h average [µg/m³]	MAYFIELD PM10 24h average [µg/m³]	BERESFIELD PM10 24h average [µg/m³]
01/08/2021	19.8	29.4	38.3	23.8	24.1	21.4
02/08/2021	15.6	17.9	33.3	20.6	23.9	16
03/08/2021	9.3	13.5	18.7	10.2	13.5	11.1
04/08/2021	8.8	10.1	16.4	8.4	10.9	12.8
05/08/2021	7.2	13.4	16.6	14.7	10.8	10.3
06/08/2021	13.1	16.7	23.5	14.6	18.4	18.9
07/08/2021	16.7	19.3	21.4	19.9	17.3	17.6
08/08/2021	17.4	21.2	35.7	19.8	22.6	21.5
09/08/2021	17.3	30	60.2	25.4	26.2	19.7
10/08/2021	14.5	26.6	34	18.9	20.3	18.4
11/08/2021	17.7	31	25.5	18.8	19	16.1
12/08/2021	14.6	23.5	25.7	16.1	-	18.2
13/08/2021	19.5	34.8	45.2	22.9	-	19.4
14/08/2021	22.9	26.1	34.8	23.8	-	24.9
15/08/2021	22.3	26.3	41.4	24.6	26.5	24.8
16/08/2021	13.6	18.2	26.1	11.4	17.9	23
17/08/2021	13.4	17.5	30.3	23.8	20	18.7
18/08/2021	18.6	28.2	42.6	26	26.2	23.3
19/08/2021	21.9	31	46.9	29	34.6	28.6
20/08/2021	23.8	32.5	41.8	26.4	34.1	34.3
21/08/2021	22.1	26.5	41.6	24.1	22.8	22.9
22/08/2021	21	28.9	40.1	24.9	27.9	23.6
23/08/2021	21.6	35.7	29.9	24.8	27.9	23.8
24/08/2021	2.7	4.5	7.2	2.7	3.5	3.5
25/08/2021	4	4	6.2	2.4	4.4	6.3
26/08/2021	-	15.4	21	13.2	14.4	14.3
27/08/2021	-	12	14.6	9.4	11.7	13.6
28/08/2021	14.5	20.4	25.4	17.8	18.3	15.4
29/08/2021	19.2	29.5	43.4	26.9	25.1	18.3
30/08/2021	14.9	20.8	27.2	15.5	20.6	19.2
31/08/2021	17.6	30.6	38.6	25.2	24.6	21.8
01/09/2021	25.5	38.9	46.6	38.1	40.1	30.6
02/09/2021	17.2	24.3	46.5	26.8	29.9	12.5
03/09/2021	12.4	24.7	30.8	22.4	20.5	12.7
04/09/2021	16.2	24.7	28.9	19.6	20.3	16.1
05/09/2021	7.2	8.1	11.3	6.8	5.3	8
06/09/2021	14.8	18.8	34.2	23.3	19.9	18.2
07/09/2021	15.6	22.8	46.1	31.5	23.4	23.6
08/09/2021	19.7	31.3	58.8	29.3	30.4	22.3
09/09/2021	16.1	23.2	32.3	18.1	19.5	22.4
10/09/2021	22	27.3	40.8	25.4	29	24.6
11/09/2021	18.1	31.2	48	26.1	21.3	19.8
12/09/2021	23.9	38.1	56.1	28.1	28.5	26.9
13/09/2021	12.3	15.3	17.8	17.8	17.2	12.7
14/09/2021	6.6	8	12	9.3	9.2	6.5
15/09/2021	8.4	10.5	12.6	12	12.2	9.4
16/09/2021	8.5	12.5	20	11.4	11.4	10.7
17/09/2021	12.8	21.3	44.5	18.6	19.7	9.9

Daily Averages - PM10 Time Range: 01/08/2021 00:00 to 01/01/2023 00:00						
Initial Data	WALLSEND PM10 1h average	CARRINGTON PM10 1h average	STOCKTON PM10 1h average	NEWCASTLE PM10 1h average	MAYFIELD PM10 1h average	BERESFIELD PM10 1h average
Date	WALLSEND PM10 24h average [µg/m³]	CARRINGTON PM10 24h average [µg/m³]	STOCKTON PM10 24h average [µg/m³]	NEWCASTLE PM10 24h average [µg/m³]	MAYFIELD PM10 24h average [µg/m³]	BERESFIELD PM10 24h average [µg/m³]
18/09/2021	15	22	27.9	18.8	17.9	17.5
19/09/2021	10.8	16.1	24.4	13.1	12.7	15.7
20/09/2021	17.6	26.6	40.8	20.4	23.2	20.6
21/09/2021	11.3	16.3	20.6	17.7	19	13.3
22/09/2021	10.7	16.1	24.9	17.1	13.5	13.8
23/09/2021	13.3	23	30.7	18.1	18	19.4
24/09/2021	17.6	29.4	43.6	22	22.9	24.2
25/09/2021	21.8	33.8	46.9	32.6	28.2	24.5
26/09/2021	9.6	15.4	22.4	16.9	12.9	10.8
27/09/2021	11.5	22.5	42.1	17.2	18.3	11.4
28/09/2021	12.7	25.6	46.7	24.2	21.1	12.9
29/09/2021	14.7	22.7	42.9	24.2	17.5	15.7
30/09/2021	9.5	24.5	38.5	18.7	15.9	8.7
01/10/2021	9.9	21	32.9	17.7	18.6	12.1
02/10/2021	7.6	11.5	18	9.8	9.5	9.5
03/10/2021	9	15.4	26.6	15	11.1	11.3
04/10/2021	16	21.7	37.1	18	19.6	18.7
05/10/2021	12.4	14.6	20.6	12.2	15.7	19.1
06/10/2021	19.8	25.6	39	25.1	26.8	23.5
07/10/2021	26.6	40.5	45.7	33.4	36	34
08/10/2021	27.5	36.2	59.7	38.4	40.6	29.2
09/10/2021	19.1	33.9	43	28.2	27.2	20.5
10/10/2021	22.1	34.9	34.8	27	26.2	26
11/10/2021	5.4	6.8	10.1	7.2	8.9	5.6
12/10/2021	12.4	21.1	31.2	19	19.8	12.5
13/10/2021	8.9	18.7	32.3	13.8	13.5	8.4
14/10/2021	10.8	21	39.1	20.4	20	9.1
15/10/2021	14	21.5	28.3	18.8		22.9
16/10/2021	9.1	12.1	14.3	10.6	10.9	12.4
17/10/2021	12.6	20.4	50.1	22.7	17.5	12.7
18/10/2021	16.5	25.7	41.8	22.7	27.6	19.6
19/10/2021	17.9	28.1	37.6	21.6	27	23.9
20/10/2021	8	10.5	17.1	12.4	12.8	10
21/10/2021	9.3	18.8	30.9	20.3	16.3	12.1
22/10/2021	10.1	18.9	39.4	16	16.7	11.7
23/10/2021	14.1	23.9	38.5	19.2	24.3	15.4
24/10/2021	15.3	17.8	32	22.9	20.2	17.5
25/10/2021	16.3	23.3	37.6	24.3	20.6	19.4
26/10/2021	15.8	20.9	30.5	21.5	26.1	18.1
27/10/2021	17.2	31	44.5	27.8	32.8	20.7
28/10/2021	23.3	38.9	50.3	30.6	34.5	30.2
29/10/2021	33	52	64.2	44.3	43.6	36.3
30/10/2021	21.2	27.4	36.5	31.4	28.9	25.4
31/10/2021	11.1	22.3	46.6	20.7	15.4	11.6
01/11/2021	14.4	24.3	39.2	19.4	25.1	15.8
02/11/2021	14	22.3	37.5	19.9	26.2	12.3
03/11/2021	13.2	25.5	41.7	23.8	28.9	10.1
04/11/2021	14.3	18.5	32	23.8	22.4	15.7

Daily Averages - PM10 Time Range: 01/08/2021 00:00 to 01/01/2023 00:00						
Initial Data	WALLSEND PM10 1h average	CARRINGTON PM10 1h average	STOCKTON PM10 1h average	NEWCASTLE PM10 1h average	MAYFIELD PM10 1h average	BERESFIELD PM10 1h average
Date	WALLSEND PM10 24h average [µg/m³]	CARRINGTON PM10 24h average [µg/m³]	STOCKTON PM10 24h average [µg/m³]	NEWCASTLE PM10 24h average [µg/m³]	MAYFIELD PM10 24h average [µg/m³]	BERESFIELD PM10 24h average [µg/m³]
05/11/2021	9.5	19.4	46.1	17	22.5	7.7
06/11/2021	10	23.3	47.3	19.4	17.7	10.4
07/11/2021	12.2	17.3	26.9	16.2	14.8	14.6
08/11/2021	9.3	9.9	12.1	11.2	11.5	11
09/11/2021	11	14.1	23.6	12.4	15.8	13.3
10/11/2021	12.6	19.4	37.9	18.2	20.4	-
11/11/2021	12.7	16.5		17.4	16.1	-
12/11/2021	25.8	24.2	33.8	22.3	28.3	28.2
13/11/2021	9.1	11.9	15.3	36.6	11.4	12.3
14/11/2021	10.1	9.4	13	10.1	10	10
15/11/2021	15	16.1	21.3	-	15.8	15.8
16/11/2021	11.8	17.1	23.2	-	17.4	15.4
17/11/2021	13.7	24.6	41.2	20.4	-	14.4
18/11/2021	16.2	37.4	40.9	23.7	-	14.6
19/11/2021	21.2	33.8	34.6	26.4	28.2	23.4
20/11/2021	19.8	24	25.6	23.2	24.5	22.7
21/11/2021	7.4	11.6	18.1	12.3	10	7.8
22/11/2021	13.3	18.6	34.7	21.3	17.9	12.2
23/11/2021	10	15.2	23.5	16.5	15.7	11.5
24/11/2021	15.2	21.5	35.9	20.9	22.4	12.8
25/11/2021	10.6	17.9	20.9	13.4	13.6	7.1
26/11/2021	7.6	11.1	14.4	13	16.3	6.8
27/11/2021	11.4	16.6	17.4	19.5	17.3	11
28/11/2021	16.6	21.1	23.2	26.8	20.2	17.4
29/11/2021	20.5	24.4	36.2	-	26.8	22.1
30/11/2021	13.7	15	20.7	13.3	17.8	12.1
01/12/2021	8.3	10.4	13.6	9	11.6	6.7
02/12/2021	8.4	10.6	15.9	9.7	13	9.7
03/12/2021	18.6	23.7	23.5	22.6	23.2	19.8
04/12/2021	20.8	21.3	26	23.6	26.4	22.3
05/12/2021	18.3	22	34	25.4	22.5	19.6
06/12/2021	17.7	24.1	42.6	20.9	28.7	17.2
07/12/2021	12.6	19.5	30	16.9	17.6	10.9
08/12/2021	15.4	18.7	23.7	18.6	20.4	15.2
09/12/2021	10.4	13.6	17.1	12.8	13.3	10.9
10/12/2021	10.4	10.4	14.7	9.6	12.1	13
11/12/2021	10.4	14.3	16.9	16	18.6	10.5
12/12/2021	14.1	17.3	20.2	21.6	17.8	14.3
13/12/2021	17.5	-	28.1	23.7	21.8	19.8
14/12/2021	16.7	-	23.5	16.7	18.6	19.3
15/12/2021	21.4	28.1	44.2	25.1	29.9	18.6
16/12/2021	20.6	22.6	26.2	23.7	24.9	20.1
17/12/2021	18.6	21.9	36.4	23	27.8	19
18/12/2021	19.1	34.8	43.4	29.1	23.2	20.3
19/12/2021	17.4	23.8	29.1	17.8	21.2	17.1
20/12/2021	18	24.5	29.6	19.1	24.9	19.6
21/12/2021	23.9	27.9	34.3	24.3	30.6	27.5
22/12/2021	25.6	27.4	30.2	26.7	31.8	30.9

Daily Averages - PM10 Time Range: 01/08/2021 00:00 to 01/01/2023 00:00						
Initial Data	WALLSEND PM10 1h average	CARRINGTON PM10 1h average	STOCKTON PM10 1h average	NEWCASTLE PM10 1h average	MAYFIELD PM10 1h average	BERESFIELD PM10 1h average
Date	WALLSEND PM10 24h average [µg/m³]	CARRINGTON PM10 24h average [µg/m³]	STOCKTON PM10 24h average [µg/m³]	NEWCASTLE PM10 24h average [µg/m³]	MAYFIELD PM10 24h average [µg/m³]	BERESFIELD PM10 24h average [µg/m³]
23/12/2021	21.2	23.5	36.7	21	26.4	16.6
24/12/2021	-	19.4	26.7	17.2	18.2	13.3
25/12/2021	-	15	32.3	12.9	17.8	10.5
26/12/2021	-	17.4	26.3	15.2	16	12.2
27/12/2021	-	17.5	22.7	20.5	16.7	11.9
28/12/2021	-	14.6	23.8	19	11.4	8.7
29/12/2021	-	13.4	20.5	11.4	10.9	10.7
30/12/2021	-	12.5	27	13.8	13	11.3
31/12/2021	-	17.6	32.9	17	16.2	9.4
01/01/2022	11.5	18.7	29.3	16.7	16.7	10.3
02/01/2022	15.3	24.1	35.3	18.7	21.7	11.9
03/01/2022	14.7	18.6	38.2	23.7	21.8	16.6
04/01/2022	15.5	20.2	52.6	34.2	20.8	18.2

Air quality in Newcastle: Winter 2021

Air quality in the Newcastle region was predominantly good during winter 2021. Daily particle levels were within national benchmarks for 98% of the time at Stockton and 100% of the time at all other stations. Stockton particle levels typically are affected by sea salt due to the station's proximity to the coast[1]. Hourly particle levels were in the good to fair air quality categories for 99.2% to 100% of the time throughout the region.

- Levels of nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and ammonia (NH_3) were good, all remaining below national benchmark concentrations and assessment goals.
- Daily average levels of fine particulate matter PM2.5 (particles less than or equal to 2.5 microns in diameter) remained below the national benchmark of 25 micrograms per cubic metre (µg/m3).
- Daily average levels of particulate matter PM10 (particles less than or equal to 10 microns in diameter) were above the 50 µg/m^3 national benchmark on 2 days (2 June and 9 August 2021), both occurring at Stockton. Regional maximum daily PM10 levels on these days ranged from 53.7 to 60.2 µg/m^3.
- At Stockton, elevated hourly PM10 levels (> 75 µg/m^3) predominantly occurred under onshore north-easterly to south-easterly winds (67% of the time that levels were elevated). The events on 2 June and 9 August were likely due to sea salt[1] with light winds coming onshore from the north-east on both occasions. See Stockton section for further details.
- Stockton recorded the regional daily PM10 maximum concentration on 86% of winter days in 2021.

Annual air quality trends in the Newcastle region

A comparison of annual average PM10 and PM2.5 levels shows the long-term trends. The national annual average benchmarks are 25 µg/m^3 for PM10 and 8 µg/m^3 for PM2.5, based on a calendar year.

Figure 1 shows the PM10 and PM2.5 **rolling** annual averages[2], based on the 12-month periods to the end of winter, for 2015 to 2021.

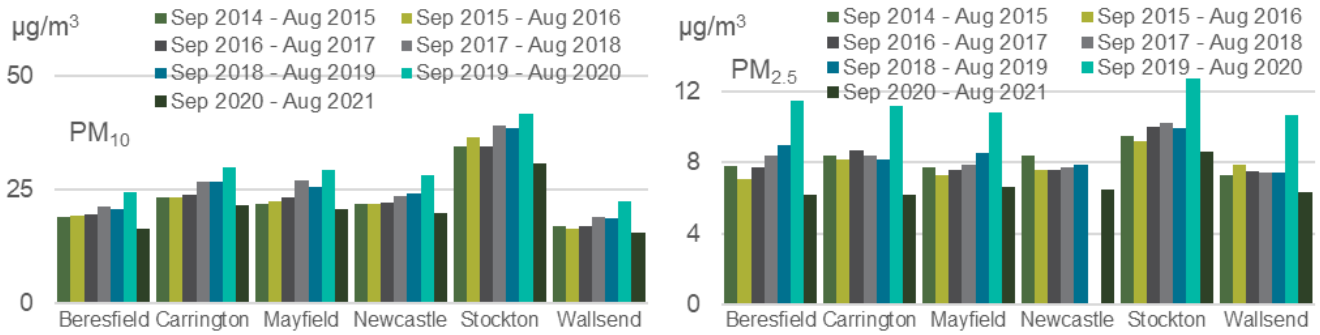


Figure 1 PM10 and PM2.5 annual averages – 2015 to 2021

The comparison in Figure 1 shows a large decrease in particle levels throughout the region during the 12-month to the end of winter 2021, compared to the same 12-month period in previous years (especially compared to the end of winter 2020). Annual average PM10 and PM2.5 were the lowest at each station in the region since the network began operation. In contrast, particle levels across the region during the 12-months to the end of winter 2020 were the highest since the network began due to the extended and intense NSW bushfire period in spring–summer 2019–20.

[1] Lower Hunter Particle Characterisation Study.

[2] Rolling averages are not intended to be compared to benchmarks. The rolling annual averages provide a guide to long-term trends, using the most up to date monitoring data.

The lowest particle levels on record resulted from cooler, wetter conditions in 2020 and early 2021, which reduced impact from dust storms and likelihood of bushfires. At the end of winter 2021, 7% of New South Wales was drought affected (Figure 2), compared to 35% of the State drought declared by the end of winter 2020[3].

The higher PM10 and PM2.5 annual averages at Stockton were consistent with findings of the Lower Hunter Particle Characterisation Study. This study found that PM10 at Stockton was 2 and a half times higher than Mayfield, mainly due to fresh sea salt. It also found 40% more PM2.5 at Stockton compared to Mayfield, Beresfield and Newcastle. This was due to more sea salt in onshore winds and primary ammonium nitrate in north-west winds, particularly in winter (and very likely due to Orica's ammonium nitrate manufacturing facility on Kooragang Island).

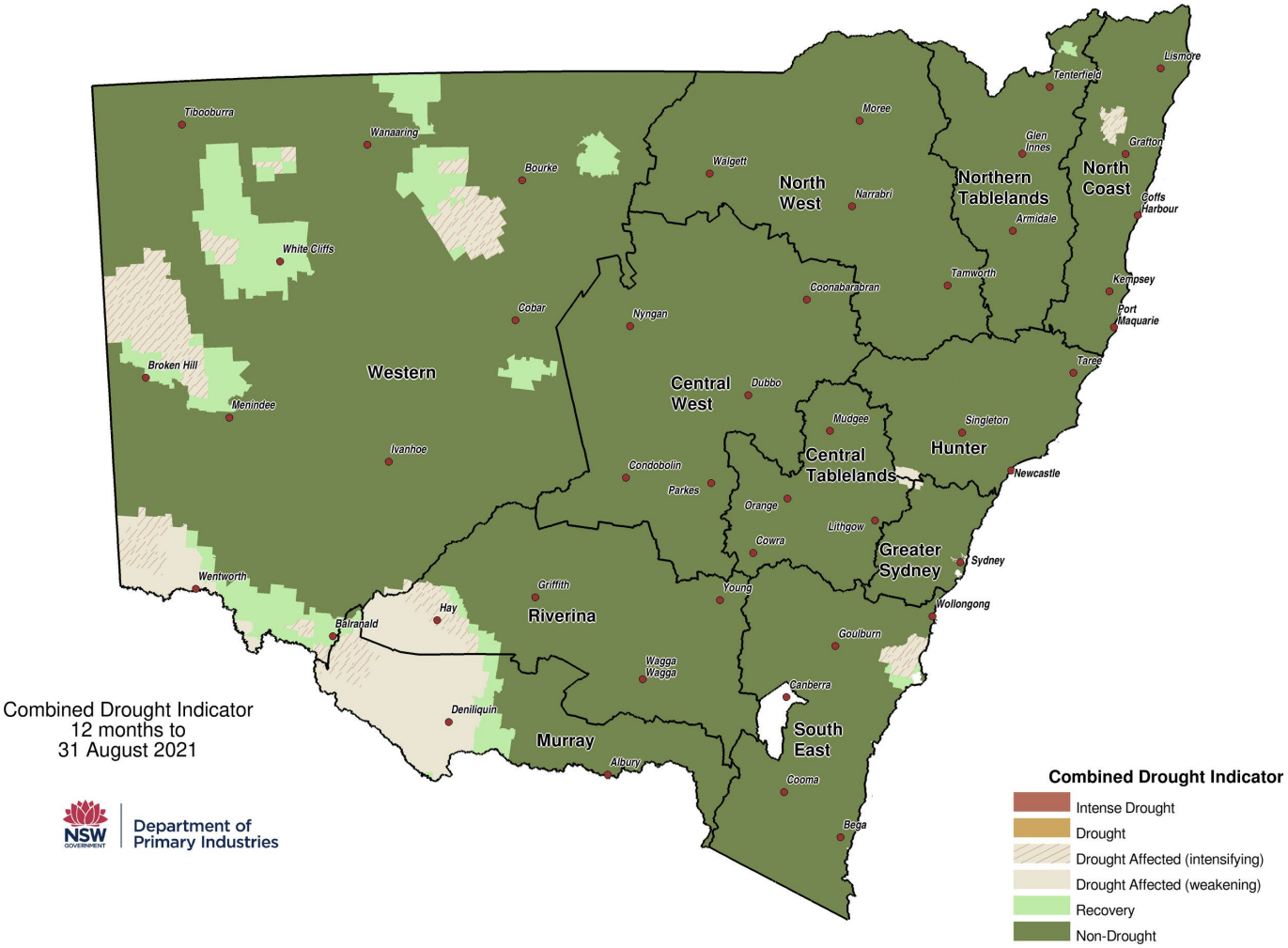


Figure 2 **Department of Primary Industries NSW Combined Drought Indicator to 31 August 2021[4]**

[3] Sourced from Department of Primary Industries NSW State seasonal update – May 2020 (accessed October 2021).

[4] Sourced from Department of Primary Industries Monthly State Seasonal Update Figures (accessed October 2021).

Days above benchmark concentrations

There were 2 days over the PM10 daily benchmark in winter 2021, 2 June and 9 August 2021, both occurring at Stockton. Concentrations of PM2.5, SO_2, NO_2 and NH_3 remained below relevant benchmarks in winter 2021.

Table 1 Number of days above the relevant benchmarks – winter 2021

Station	PM10 daily [50 µg/m^3 benchmark]	PM2.5 daily [25 µg/m^3 benchmark]	SO_2 hourly[5] [10 pphm benchmark]	SO_2 daily[5] [2 pphm benchmark]	NO_2 hourly[5] [8 pphm benchmark]	NH_3 hourly [46 pphm benchmark]
Beresfield	0	0	0	0	0	-
Carrington	0	0	0	0	0	-
Mayfield	0	0	0	0	0	-
Newcastle	0	0	0	0	0	-
Stockton	2	0	0	0	0	0
Wallsend	0	0	0	0	0	-

µg/m^3 = micrograms per cubic metre
pphm = parts per hundred million by volume (i.e. parts of pollutant per hundred million parts of air)
- = not monitored

[5] Note: The National Environment Protection (Ambient Air Quality) Measure (Air NEPM) was updated on 18 May 2021. New national benchmarks were introduced for hourly SO_2 (now 10 pphm), daily SO_2 (now 2 pphm) and hourly NO_2 (now 8 pphm).

Daily time series plots

Daily average time series plots for PM10 and PM2.5 and daily one–hour maximum plots for NO_2, SO_2 and NH_3 show the concentrations throughout the winter season (Figure 3 to Figure 7).

Levels of PM2.5, NO_2, SO_2 and NH_3 remained below the benchmarks[5] and assessment criteria throughout the season.

PM10 levels remained below the benchmark at most stations, except for 2 days at Stockton. Stockton PM10 levels were most likely affected by sea salt on 2 June and 9 August, due to its proximity to the coast. See Stockton section for further details.

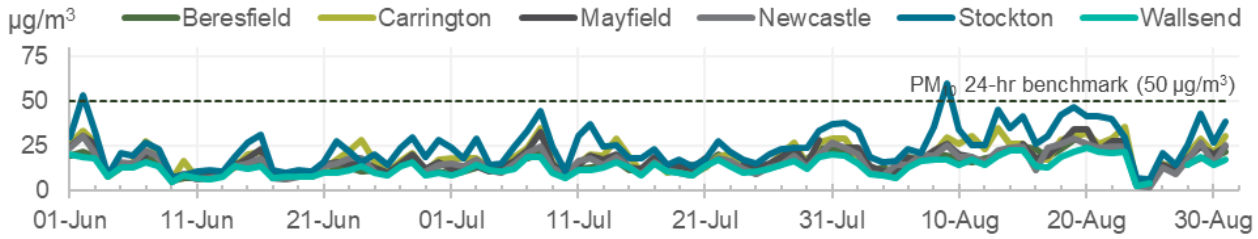


Figure 3 **Daily average PM10 during winter 2021**

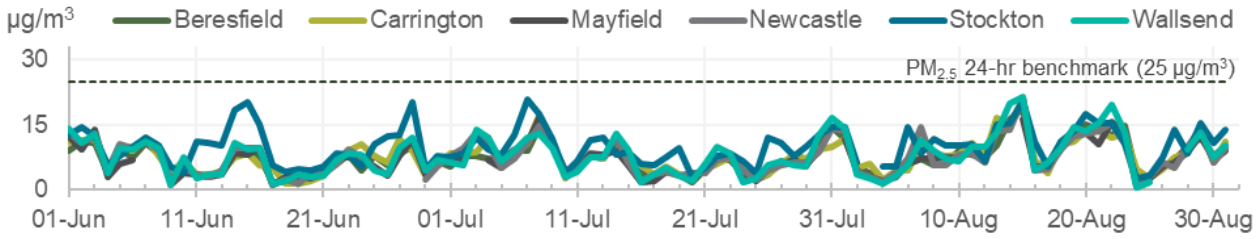


Figure 4 **Daily average PM2.5 during winter 2021**

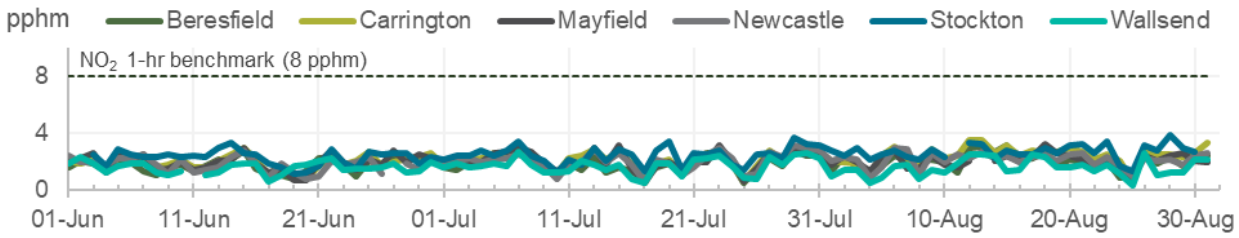


Figure 5 **Daily maximum 1-hr NO_2 during winter 2021**

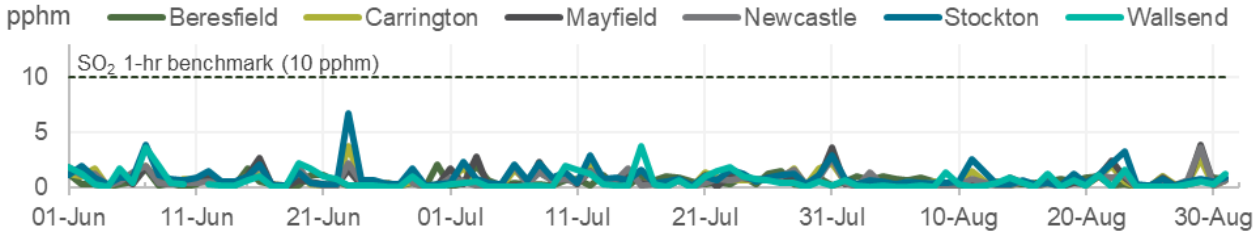


Figure 6 **Daily maximum 1-hr SO_2 during winter 2021**

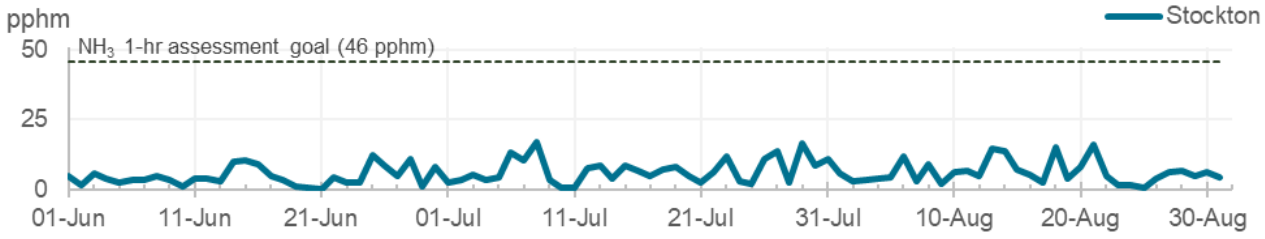


Figure 7 **Daily maximum 1-hr NH_3 during winter 2021**

Pollution roses from hourly particle data

The seasonal pollution rose maps[6] (Figure 8 and Figure 9) show that hourly[7] PM10 and PM2.5 levels generally remained low during the season.

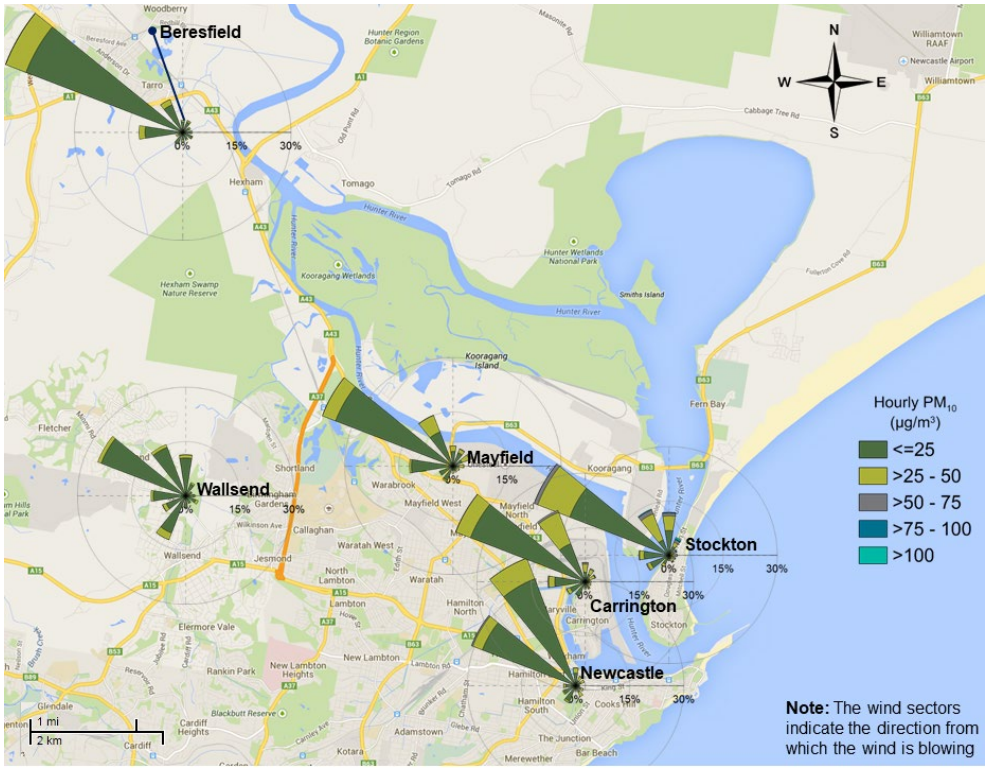


Figure 8 **Hourly PM10 pollution roses for the Newcastle region for winter 2021**

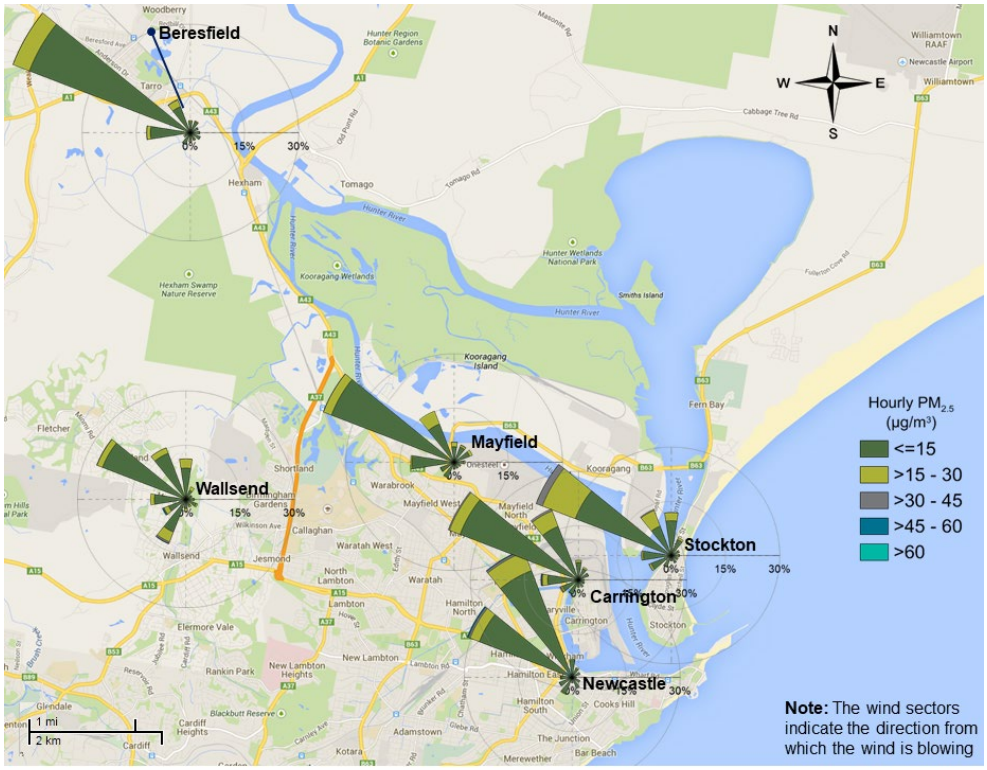


Figure 9 **Hourly PM2.5 pollution roses for the Newcastle region for winter 2021**

[6] Pollution roses show the wind direction and particle levels at a location. The length of each bar around the circle shows the percentage of time the wind blows from a particular direction. The colours along the bars indicate categories of particle levels.

[7] There are no standards for hourly PM10 or PM2.5 in the Air NEPM.

Seasonal comparisons

This section compares air quality levels in winter 2021 with previous winter seasons, where data were available[8].

All days were below benchmark concentrations for NO_2 and SO_2 in winter during the past 9 years at Beresfield, Newcastle, Stockton and Wallsend and since monitoring began at Carrington and Mayfield.

For NH_3 at Stockton, there were no days over the assessment criterion in winter during the past 9 years.

There were no days above the PM2.5 benchmark during winter 2021. In earlier years, there were 3 over the PM2.5 benchmark at Stockton in 2013; 5 days in 2015, at Beresfield, Carrington, Mayfield and Newcastle (one day each) and Stockton (3 days). There was one day over the benchmark at Stockton in 2019 and one at Newcastle in 2020.

There were 2 days over the PM10 benchmark during winter 2021, both at Stockton. This was the same number of days over the benchmark as in 2020. There were fewer winter days above the PM10 benchmark in 2020 and 2021, compared with recent winters, with 5 days above the benchmark in winter 2019 and 8 days in winter 2018.

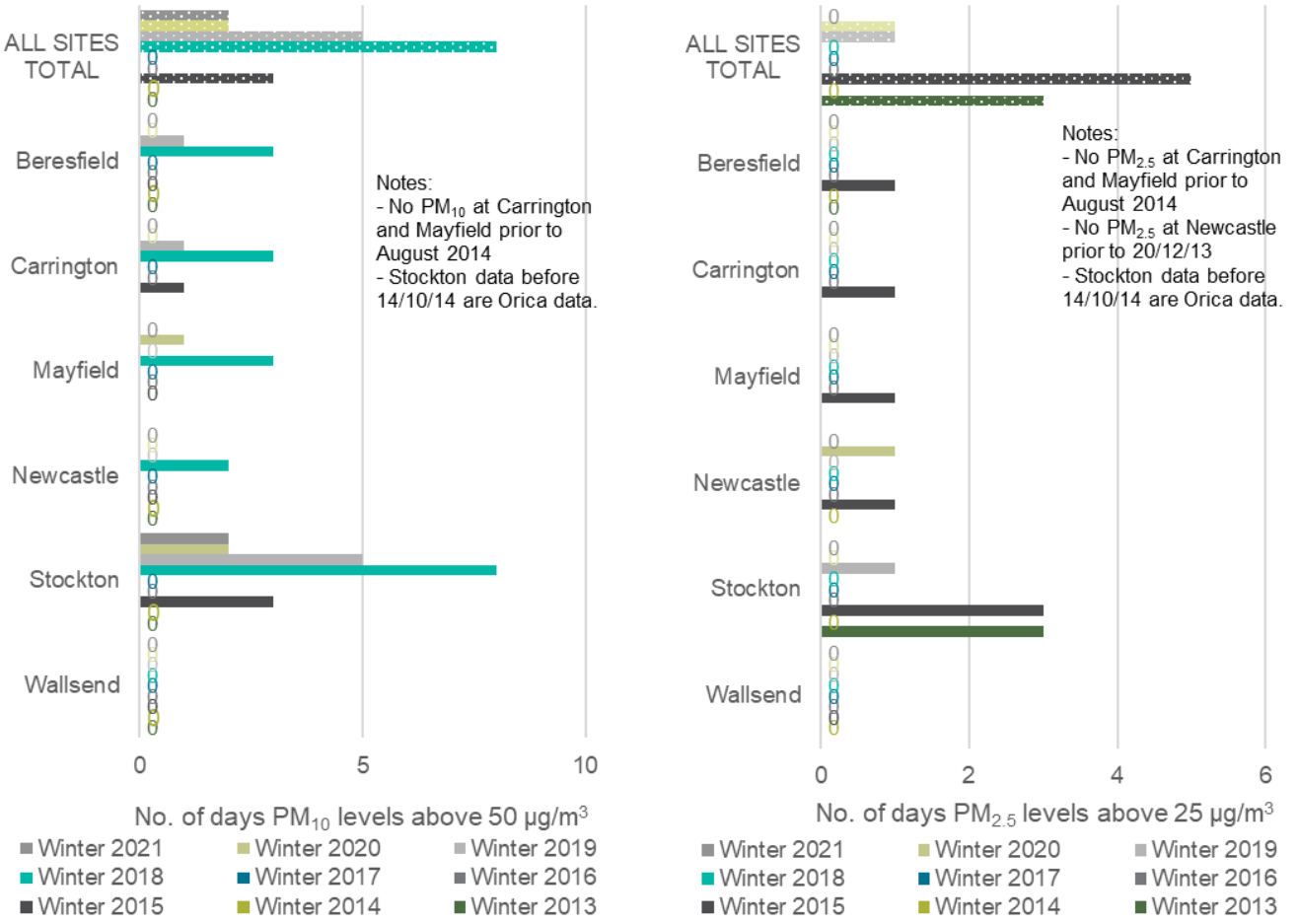


Figure 10 Number of days above the PM10 and PM2.5 daily benchmarks: winter 2013 to 2021

[8] Monitoring at Stockton commenced in October 2012 and at Mayfield and Carrington in August 2014. Monitoring of PM2.5 at Newcastle commenced in December 2013. Stockton air quality monitoring was undertaken by Orica from October 2012 to October 2014. From October 2014 it was undertaken by the NSW government as part of the Newcastle Local Air Quality Monitoring Network.

Particle air quality trends in the Newcastle region

Figure 11 and Figure 12 show daily average PM10 during winter 2021, compared to the daily maximum and minimum PM10 levels (i.e. shaded range) from winter 2013 to 2020, at Stockton and Newcastle. Daily PM10 levels were generally within the historical range throughout the season, and often towards the lower end of the range, especially in June and July. Rainfall at Newcastle was near average in July, but was relatively low in July and August.

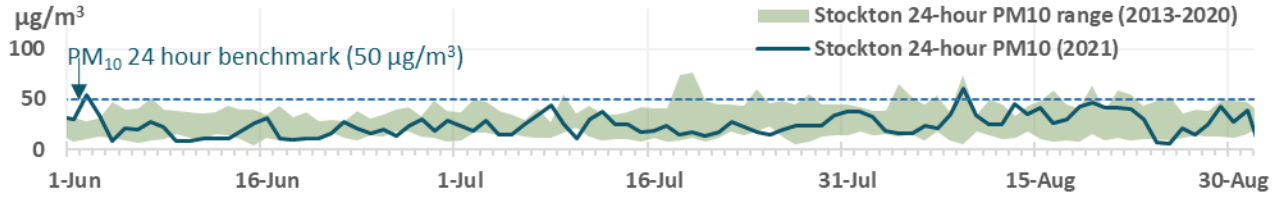


Figure 11 **Stockton daily average PM10 during winter 2021 plotted against the daily maximum and minimum PM10 levels from 2013 to 2020**

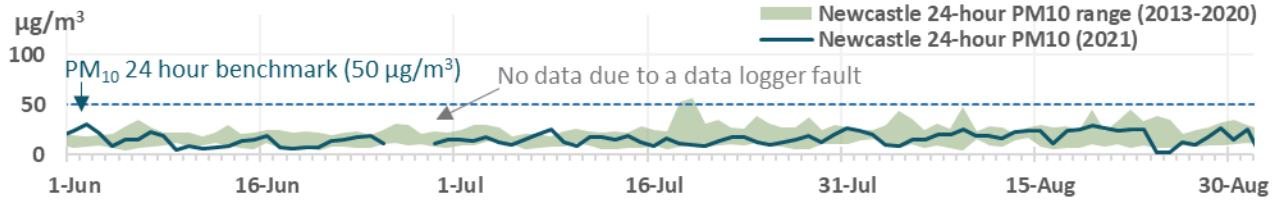


Figure 12 **Newcastle daily average PM10 during winter 2021 plotted against the daily maximum and minimum PM10 levels from 2013 to 2020**

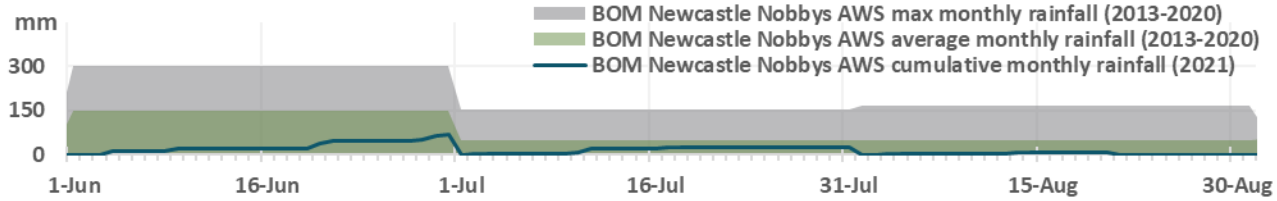


Figure 13 **Bureau of Meteorology Newcastle Nobbys Signal Station AWS[9] cumulative rainfall during winter 2021 plotted against maximum and average rainfall from 2013 to 2020**

Figure 14 and Figure 15 show daily average PM2.5 during winter 2021, compared to the daily maximum and minimum PM2.5 levels (shaded range) from 2014 to 2020, at Stockton and Newcastle. Daily PM2.5 levels were generally within the historical range throughout the season, and often at the lower levels.

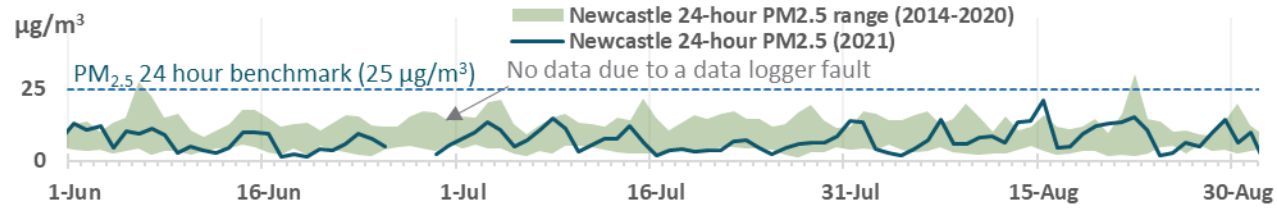


Figure 14 **Newcastle daily average PM2.5 during winter 2021 plotted against the daily maximum and minimum PM2.5 levels from 2014 to 2020**

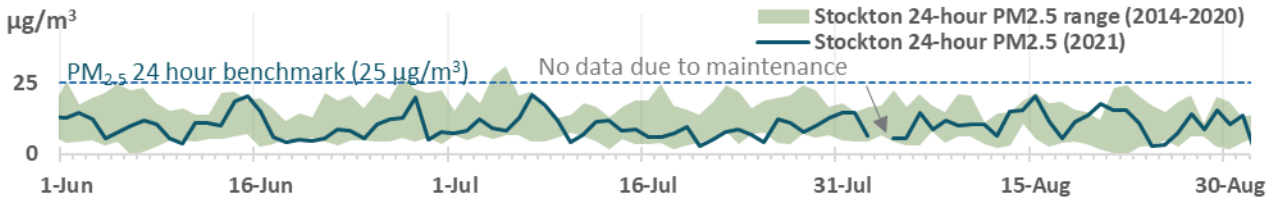


Figure 15 **Stockton daily average PM2.5 during winter 2021 plotted against the daily maximum and minimum PM2.5 levels from 2014 to 2020**

[9] Data from Bureau of Meteorology Newcastle Nobbys Signal Station AWS monthly rainfall page (accessed October 2021).

Meteorological summary

Rainfall and temperature[10]

The Newcastle region experienced below average rainfall overall during winter 2021 compared to long-term records (Figure 16).

Winter 2021 was dryer than the 3 previous winters, with 100 to 200 millimetres less rain than winters in 2020 and 2019 and 50 to 200 millimetres less than winter 2018.

Maximum and minimum temperatures were above average during the season (Figure 17).

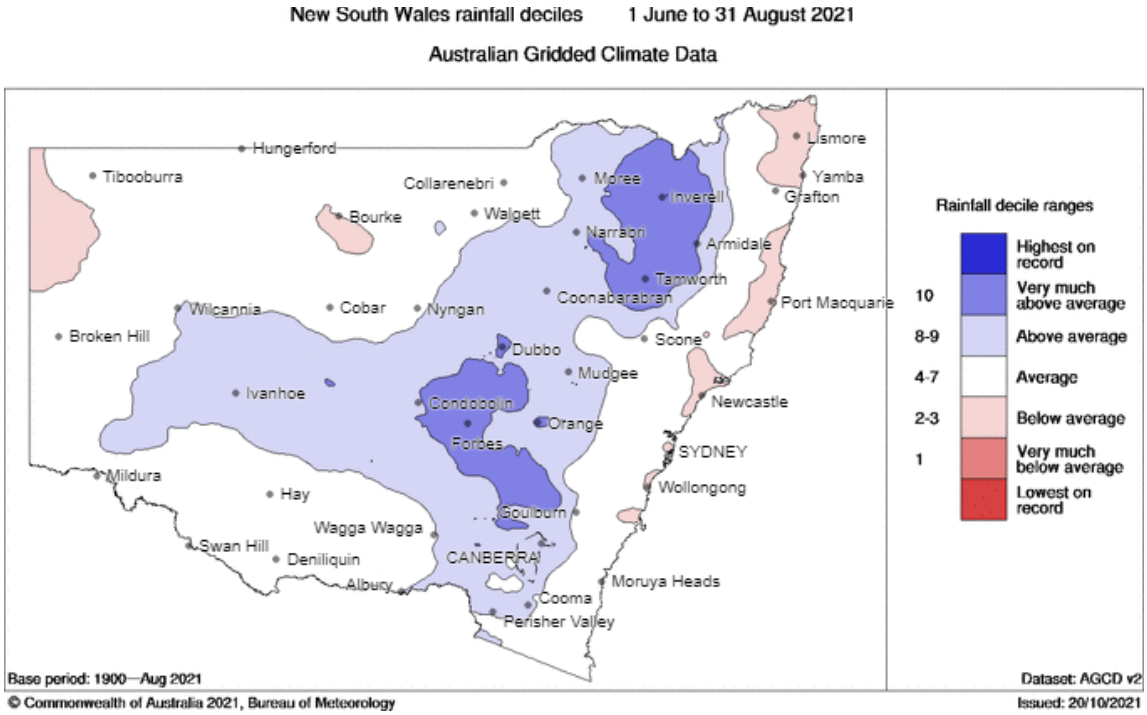


Figure 16 NSW rainfall deciles – winter 2021

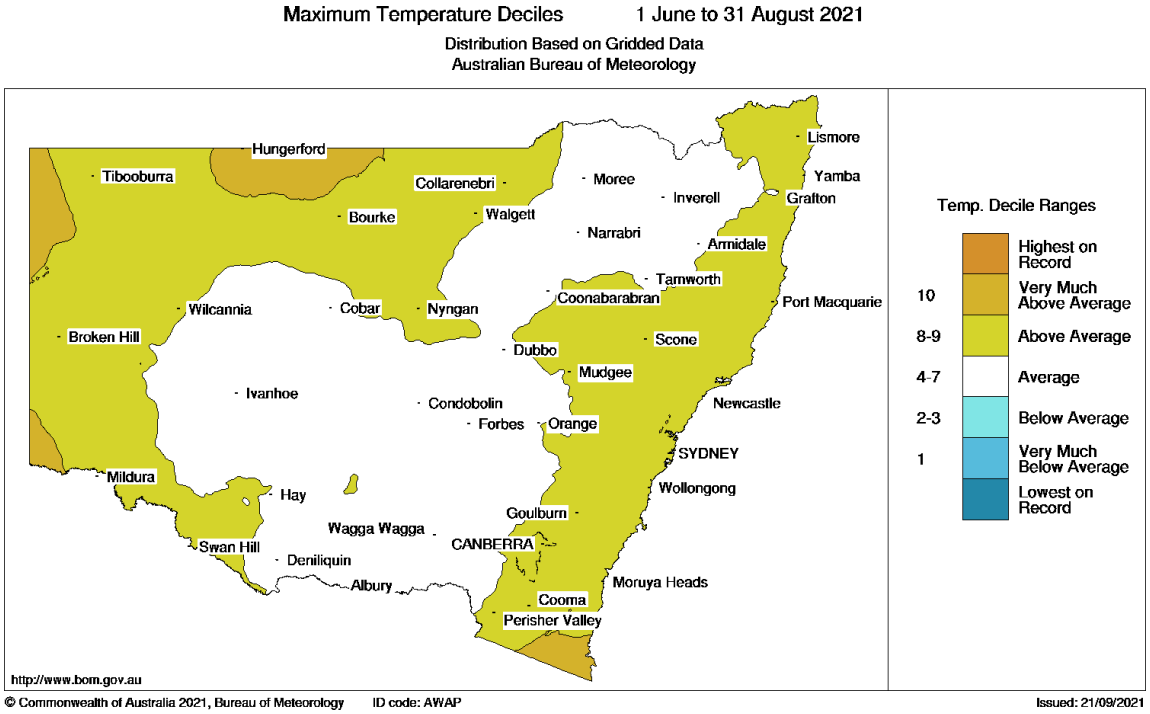


Figure 17 NSW maximum temperature deciles – winter 2021

[10] Rainfall and temperature information is from the Bureau of Meteorology New South Wales winter 2021 climate statement (access October 2021) and climate maps (accessed October 2021).

Wind

Winds were predominately from the north-west region during winter 2021, which was typical for this time of year. For example, Figure 18 shows that north-west winds prevailed 43% of the time at Stockton, with these moderate or stronger winds (above 5 metres per second) 17% of the time. The duration of prevailing north-west winds was similar to previous winters, with more frequent moderate to strong winds in 2021, 2020 and 2018, compared to 2019.

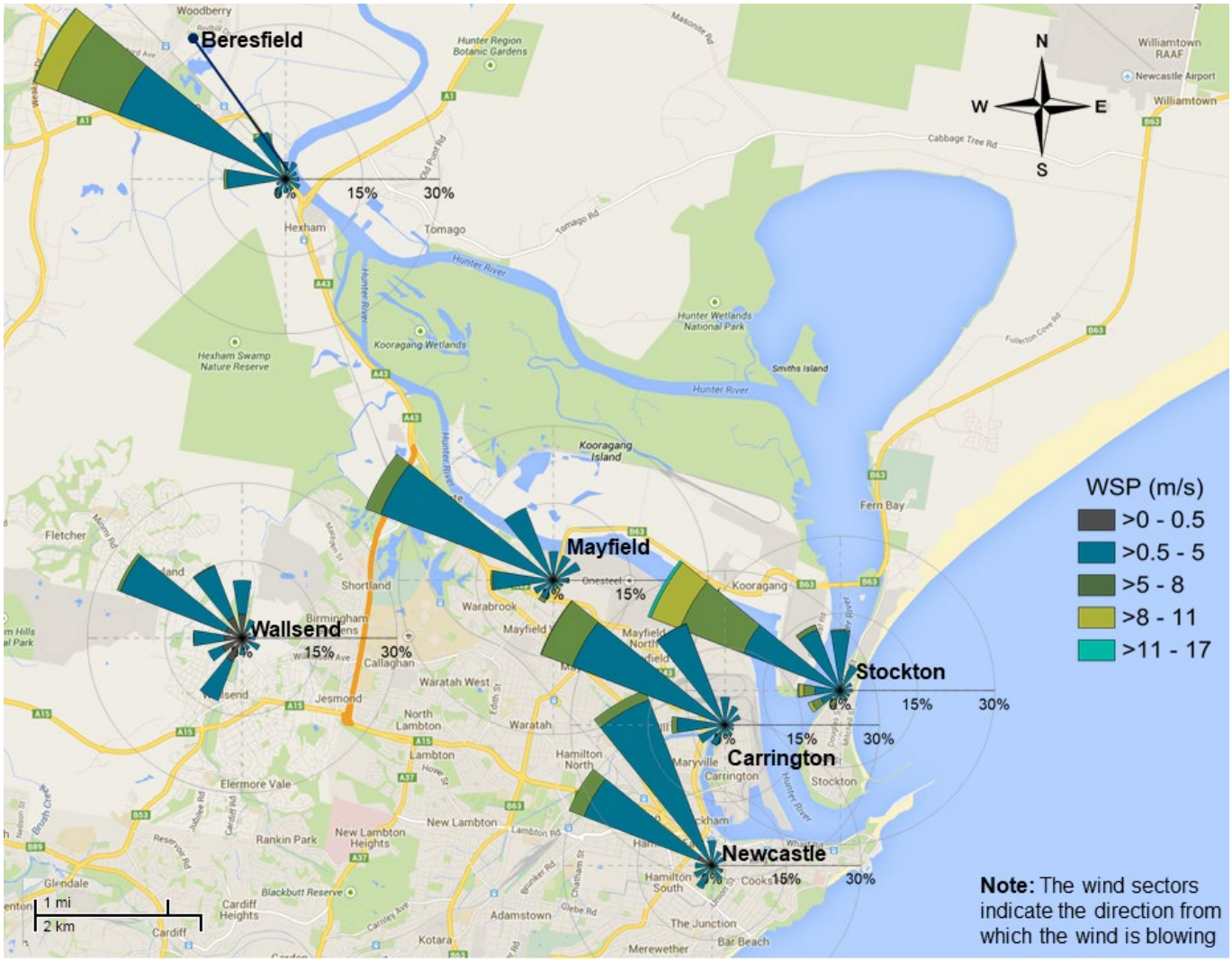


Figure 18 **Wind rose map[11] for the Newcastle region for winter 2021**

[11] Wind roses show the wind direction and speed at a location. The length of each bar around the circle in these wind roses shows the percentage of time the wind blows from a particular direction. The colours along the bars indicate the wind speeds.

Stockton

Particles at Stockton in winter 2021

Stockton recorded 2 days over the PM10 daily benchmark during winter 2021 (2 June and 9 August 2021). This was the same number of days over the PM10 benchmark as in winter 2020. In previous years, up to 8 winter days were over the PM10 benchmark, with 3 days in 2015, 8 days in 2018 and 5 days in 2019 (Figure 10).

In winter 2021, elevated hourly PM10 levels (>75 µg/m^3)[12] were recorded at Stockton 1.9% of the time (Figure 19). These occurred under:

- onshore north-easterly to south-easterly winds 67% of the time (28 hours, 1.3% total for winter)
- north-westerly winds 7% of the time (7 hours, 0.3% total for winter).

Elevated hourly PM10 levels under predominant onshore winds at Stockton indicate the potential contribution of sea salt, as was observed during the 2 June and 9 August events. The Lower Hunter Particle Characterisation Study found sea salt was a major contributor of particles at the station under onshore winds.

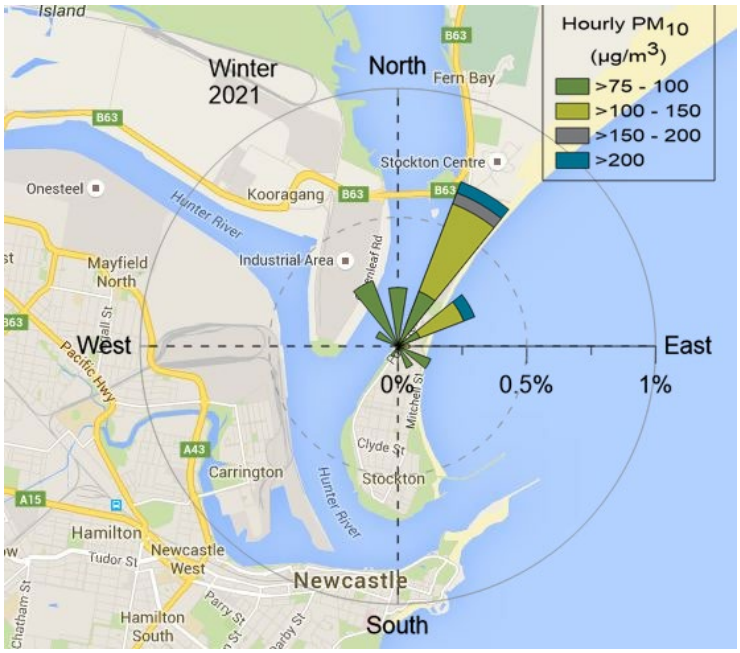


Figure 19 Stockton winter 2021 PM10 pollution rose – proportion of hourly averaged PM10 levels >75 µg/m^3 by wind direction

The Stockton monitoring station did not record any days over the PM2.5 daily benchmark during winter 2021. This was the same as all previous years (Figure 10). Elevated levels of hourly PM2.5 (>40 µg/m^3)[12] occurred 0.5% of the time (10 hours) during winter from the west to north-west (Figure 20).

[12] There are no standards for hourly PM10 or PM2.5 in the Air NEPM.

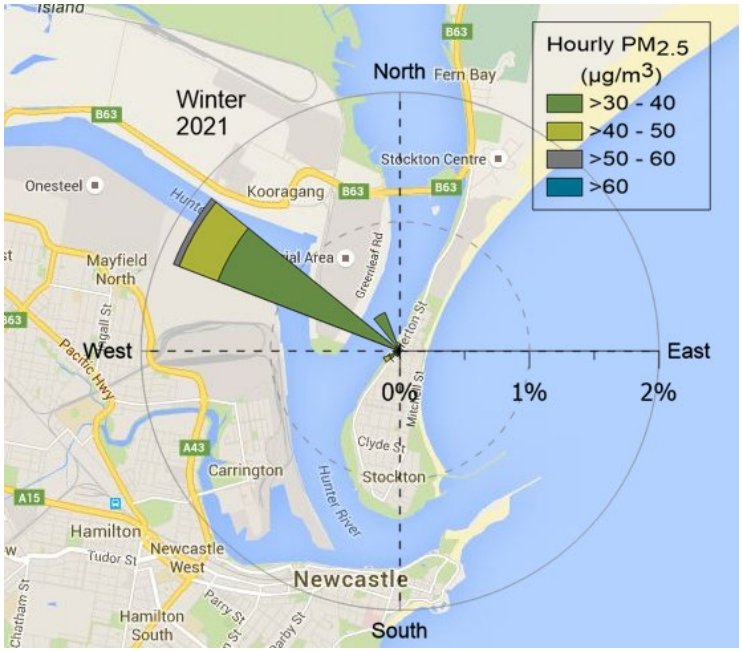


Figure 20 **Stockton winter 2021 PM2.5 pollution rose – proportion of hourly averaged PM2.5 levels >30 µg/m3 by wind direction**

Ammonia at Stockton in autumn and winter 2021

There were no days over the hourly NH_3 assessment goal of 46 pphm at Stockton during autumn and winter 2021.

NH_3 levels at Stockton follow a seasonal pattern with levels increasing in cooler months (when winds are predominantly from the north-west) and decreasing in warmer months (when winds are predominantly onshore easterly) (Figure 21). The primary ammonia source at Stockton is Orica's ammonium nitrate manufacturing facility on Kooragang Island, located to the north-west of the station[1].

Figure 21 shows that the maximum 1-hour average NH_3 concentrations from 2013 to 2021, were highest in 2013 and lowest in 2016 and 2019.

Figure 22 shows the daily NH_3 1-hour maximum concentrations in 2021, plotted against the daily minimum and maximum levels from 2013 to 2020. This shows that daily 1-hour maximum NH_3 levels in autumn and winter 2021 were generally within the range of autumn and winter periods in earlier years.

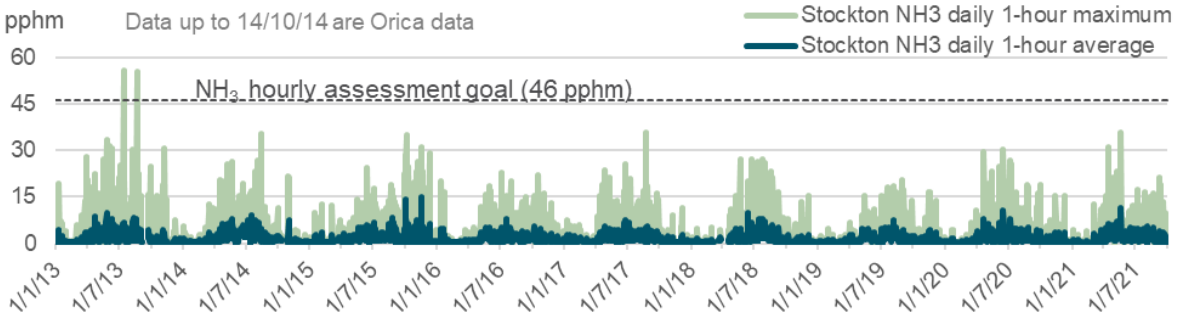


Figure 21 **Stockton daily 1-hour maximum and average NH_3 from 2013 to 2021**

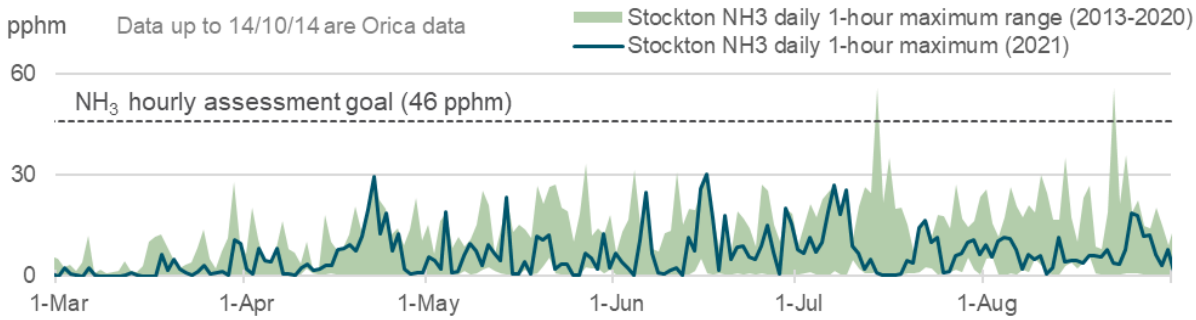


Figure 22 **Stockton daily 1-hour maximum NH_3 for autumn and winter 2021 compared to daily levels from autumn and winter 2013 to 2020**

Network performance

The target network performance is at least 95% available data for all parameters. For NO_2, SO_2 and NH_3, the maximum online time that can be attained is 96% due to daily calibrations.

Table 2 Online performance (%) during winter 2021

Station	Particles PM10 daily	Particles PM2.5 daily	Gases SO_2 Hourly	Gases NO_2 hourly	Gases NH_3 hourly	Meteorology Wind hourly
Beresfield	100	100	95	95		100
Carrington	100	99	92	95		100
Mayfield	92	89	92	92		96
Newcastle	97	97	93	94		98
Stockton	100	99	95	91	93	100
Wallsend	98	98	94	94		100

- = not monitored

The overall reduced online times were mainly due to:

- Mayfield PM10 – instrument fault (7 days)
- Mayfield PM2.5 – instrument fault (9 days) and scheduled maintenance (one day)

This document was prepared by Sean Watt and reviewed by Dr Upma Dutt, David Salter and Dr Leanne Graham.

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APPENDIX G – NOISE COMPLIANCE ASSESSMENT REPORT

Prepared for
Port of Newcastle Operations Pty Ltd
ABN: 97 539 122 070

Mayfield No. 4 Berth

Operational Noise Compliance Assessment (2021)

17-Jan-2022
Doc No. 60620229-RPNV-08_0
Commercial-in-Confidence

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Delivering a better world

Mayfield No. 4 Berth

Operational Noise Compliance Assessment (2021)

Client: Port of Newcastle Operations Pty Ltd

ABN: 97 539 122 070

Prepared by

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17-Jan-2022

Job No.: 60620229

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Quality Information

Document Mayfield No. 4 Berth

Ref 60620229-RPNV-08_0

Date 17-Jan-2022

Prepared by Philip Du

Reviewed by Patrick Martinez

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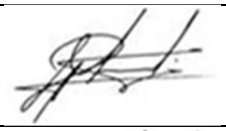
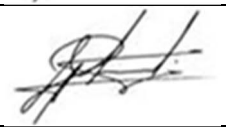
Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	23-Dec-2021	Draft for client's comments	Patrick Martinez Associate Director - Acoustics	
0	17-Jan-2022	Final	Patrick Martinez Associate Director - Acoustics	

Table of Contents

List of Tables

List of Figures

1.0 Introduction

Port of Newcastle Operations Pty Ltd (PON) commissioned AECOM Australia Pty Ltd (AECOM) to carry out noise compliance measurements of associated operations at Mayfield No. 4 Berth in Newcastle, NSW.

The operations at Mayfield No. 4 Berth are one part of the overall Multi-Purpose Terminal operations at the former BHP Steelworks Main Site.

Condition 5.11 of the Consent Condition DA-293-08-00 MOD 9, dated 29 August 2013, requires that the facility demonstrates compliance with site noise limits at various noise sensitive receivers near the facility.

The major noise producing operations that take place at Mayfield No. 4 Berth are:

1. Containers being unloaded from ships onto the wharf;
2. Offloading of Ammonium Nitrate bulk-bags from ship; and
3. Containers being loaded/unloaded from trucks prior to and after ship arrival/departure.

Previous operational noise compliance assessments undertaken by AECOM (2011 to 2013 and 2019 to 2020) have confirmed consistent compliance from these berth operations over these years.

Bulk fuel operations commenced in 2014 and were ceased in 2018 following commissioning of Mayfield No. 7 Berth (i.e., the measurements presented in this report were undertaken after the ceasing of bulk fuel operations). Bulk fuel operations also consistently achieved compliance as documented in four previous operational noise compliance assessments undertaken by AECOM:

1. Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60333368-RPNV-01_C, dated 24 November 2014.
2. Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60437494-RPNV-02_B, dated 11 November 2015.
3. Mayfield No. 4 Berth, Operational Noise Compliance Assessment, 60518192-RPNV-02_B, dated 5 December 2016.
4. Mayfield No.4 Berth, Operational Noise Compliance Assessment, 60553318-RPNV-02_B, dated 18 December 2017.

Due to adverse weather conditions, the 2018 operational noise compliance assessment was undertaken based on previous years' noise measurements. The 2018 noise compliance assessment is presented in the following AECOM document:

1. Mayfield No.4 Berth, Operational Noise Compliance Assessment (2018), 60553318-RPNV-03_B, dated 15 February 2019.

As presented in previous years' operational noise compliance assessments, it is not possible to directly measure the impact of noise arising from operations at Mayfield No. 4 Berth due to the influence from extraneous noise sources at nearby receiver locations. This evaluation was confirmed as still valid during measurements undertaken during the 2021 noise monitoring period. The compliance assessment was therefore carried out using SoundPLAN noise modelling software.

This method of noise compliance assessment is in accordance with Chapter 11 of the NSW Environment protection Authority's (EPA) Industrial Noise Policy (INP). In order to determine compliance of the site operational noise emissions with the required noise limits, the assumptions of a 'reasonable' worst case operational scenario are presented, along with the predicted noise levels at the required assessment locations.

Attended noise measurements were undertaken on 9 and 10 December 2021, at the assessment receiver locations. Nearfield measurements of the vessel *BBC Naples – IMO NO. 9484223* and

activities associated with the loading of CAT 985C trucks onto the vessel were carried out on 9 December 2021. Additionally, activities associated with the loading of steel billets onto trucks was occurring concurrently and were also measured. The results of the nearfield measurements were used as inputs for the noise modelling.

1.1 EPA Noise Policy for Industry

The *NSW Industrial Noise Policy* (EPA 2000) was withdrawn in November 2017 and replaced by the *Noise Policy for Industry* (EPA 2017) except as describe in the EPA document *Implementation and transitional arrangements for the Noise Policy for Industry (2017),* point 8, as presented below:

> *8. The NSW Industrial Noise Policy (2000) will continue to apply where it is referenced in existing statutory instruments (such as consents and licences), except for the NSW Industrial Noise Policy Section 4 modifying factors, which will be transitioned to the Noise Policy for Industry (2017) Fact Sheet C through a NSW Industrial Noise Policy application note. This approach has been taken because the Noise Policy for Industry (2017) modification factor approach reflects more recent understanding of the impact of tonal and low-frequency noise on the community.*

Acoustic terminology used in this report is included in Appendix A.

2.0 Assessment Noise Limits

2.1 Development Application Consent Condition noise limits

The required noise limits for each of the identified receivers is provided in Condition 5.11 of the Development Application DA 293-08-00 MOD 9, dated 29 August 2013.

Table 1 provides a summary of the applicable noise limits.

Table 1 Operational noise limits

Location	Day	Evening	Night
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
1. 52 Arthur Street	49	38	38
2. Mayfield East Public School	47	37	37
3. 21 Crebert Street	49	39	39
4. Newcastle TAFE	44	38	38
5. 1 Arthur Street	48	33	33

Notes:

1. In accordance with the INP time of day is defined as follows:

   Day – the period from 7:00 am to 6:00 pm Mondays to Saturdays or 8:00 am to 6:00 pm on Sundays and public holidays

   Evening – the period from 6:00 pm to 10:00 pm

   Night – the period from 10:00 pm to 7:00 am Mondays to Saturdays or 10:00 pm to 8:00 am on Sundays and public holidays

2. The noise limits apply during all assessment periods under winds up to 3 metres per second (measured at 10 metres above ground level) and Pasquil stability classes from A to F.

Accordingly, AECOM assessed operational noise emissions from Mayfield No. 4 Berth based on 'reasonable' worst case operational scenarios to determine the predicted noise levels at the assessment locations as presented in Figure 1.

2.2 Environmental Protection Licence

Mayfield No. 4 Berth currently operates under NSW EPA Environment Protection Licence No. 13181 (EPL 13181), License version date 4 August 2020, however, there are no noise limits specified in EPL 13181.

2.3 Site location

The location of Mayfield No. 4 Berth and noise assessment locations identified in Condition 5.11, are shown in Figure 1.

Figure 1 Site location and noise assessment locations

3.0 Measurement Methodology and Results

3.1 Compliance measurements methodology and discussion

As presented in previous years' operational noise compliance assessments for Mayfield No. 4 Berth, it is not possible to directly measure the impact of noise arising from operations at Mayfield No. 4 Berth due to the influence from extraneous noise sources at nearby receiver locations. This evaluation was confirmed as still valid during measurements undertaken during the 2021 noise monitoring period. The compliance assessment was therefore carried out using SoundPLAN noise modelling software.

This method of noise compliance assessment is in accordance with Chapter 11 of the INP.

Attended noise measurements were undertaken at all the Condition 5.11 assessment receiver locations between 9 and 10 December 2021. It was found that noise from road traffic on Industrial Drive was dominant at the receiver locations and therefore demonstrating compliance with the Mayfield No. 4 Berth relevant noise criteria for the Development Application Consent was not possible. These measurements are presented in Table 3.

Thus, it was not possible to determine the noise contribution from Mayfield No. 4 Berth by direct measurement. The INP provides guidance in Chapter 11 as to how to review the noise emissions of a site where the existing noise levels are already high.

3.2 Instrumentation

Attended noise measurements were conducted using the equipment presented in Table 2.

Table 2 Measurement instrumentation

Equipment	Serial number
Brüel and Kjaer Type 2250	3009330

All equipment presented in Table 2 are designated as Class 1 instruments. All instruments were calibrated before and after the measurements using a Rion NC-74 calibrator (Serial Number 34667836) with a drift in calibration not exceeding ±0.5 dB.

All the acoustic instrumentation employed during the noise measurements comply with the requirements of Australian/New Zealand Standard AS/NZS IEC 61672.1-2019 *Electroacoustics - Sound level meters – Part 1: Specifications*.

All equipment used for this compliance assessment have valid calibration certificates.

Table 3 Attended measurements at assessment receiver locations on 9 to 10 December 2021

Location	Time of measurement	Measured noise level			Comments
		L_{Aeq} dB(A)	L_{A1} dB(A)	L_{A90}, dB(A)	
R1 - 52 Arthur Street	10/12/2021 0:11	49	60	38	INDUSTRIAL CONTRIBUTION: Background constant broadband industrial hum from north (controls background) audible in the absence of traffic. Unable to attribute to a particular site. Occasional banging from the north audible. TRAFFIC CONTRIBUTION: Road traffic noise from industrial drive controls ambient noise levels. Car pass-by on Industrial Drive ~ 45-55 dB(A). Truck pass-by on Industrial Drive ~ 55-63 dB(A). OTHER: Crickets. Weather – Minimal breeze, some cloud cover
R2 - Mayfield East Public School	9/12/2021 14:01	76	74	52	INDUSTRIAL CONTRIBUTION: . TRAFFIC CONTRIBUTION: Road traffic noise from Ingall Street and Industrial Drive dominates noise environment with significant numbers of heavy vehicles. Car pass-by on Ingall Street ~ 60-72 dB(A), truck pass-by on Industrial Drive ~ 54-76 dB(A). OTHER: Construction site on other side of Ingall Street including sawing and banging. Weather – Minimal breeze, some cloud cover.
R3 - 21 Crebert Street	9/12/2021 22:53	62	75	42	INDUSTRIAL CONTRIBUTION: Background constant broadband industrial hum from the north / north-north east (controls background). TRAFFIC CONTRIBUTION: Almost constant traffic on Industrial Drive was the main noise source (at most 30-45 seconds without a pass-by). Truck pass-by ~ 68-80 dB(A), car pass-by ~ 60-75. Trucks from Berth 4 76-78 dB(A) (carrying steel billets) OTHER: Crickets, bats occasionally cicadas. Weather – Minimal to slight breeze, mostly cloud cover

Location	Time of measurement	Measured noise level			Comments
		L_{Aeq} dB(A)	L_{A1} dB(A)	L_{A90}, dB(A)	
R5 - 1 Arthur Street	9/12/2021 22:00	50	59	45	INDUSTRIAL CONTRIBUTION: Background constant broadband industrial hum from north/north east (controls background), difficult to distinguish from distant road traffic noise nor attribute to a particular site. Occasional banging from the north audible. Moving plant siren and air brake was audible from the north. TRAFFIC CONTRIBUTION: Road traffic noise controls ambient noise levels. Trucks on industrial drive clearly audible ~ 54 dB(A) with accelerating and decelerating trucks to the north very audible. Car pass-by on Crebert Street ~ 58 dB(A). OTHER: Crickets. Weather – Minimal breeze, no cloud cover.

3.3 Direct measurement results and discussion

Section 11.1.2 Notes on noise monitoring of the INP states:

Where existing noise levels are high

When compliance is being measured it may be found that, in many cases, existing noise levels are higher than noise level from the source, making it difficult to separate out the source noise level. When this happens, it may not be feasible to measure compliance at the specified location, and other methods will be needed. In these cases, measurements may be taken closer to the source and then calculated back to the specified location."

As mentioned in Section 1.0, nearfield measurements of the vessel *Asia Pearl VII – IMO NO. 9502726* were carried out and the measurement results have been used in this assessment as inputs for the compliance noise model.

It was noted during all measurements that the specific noise source being measured was the dominant noise source throughout the measurement period and the unloading operations were occurring all through the daytime and night-time periods including during the attended measurements at the assessment receiver locations.

The measurements were not impacted by the prevailing wind during the measurement periods.

3.4 Modelled high activity operational scenarios

3.4.1 Noise modelling methodology

Noise impacts from the operation of the vessel *BBC Naples* and the loading of steel billets onto trucks at Mayfield No. 4 Berth are based upon the calculated operational source sound power levels presented in Table 4. Noise emission from the vessel's operations were predicted at the assessment receiver locations using SoundPLAN (version 8.2) noise modelling software. SoundPLAN implements a number of different calculation algorithms. The CONCAWE algorithm was used as it is especially suited to predicting noise propagation over large distances as it accounts for a range of atmospheric conditions that can significantly influence the propagation of noise over large distances.

The noise modelling includes:

- Ground topography;
- Buildings and structures;
- Noise sources as point sources or industrial buildings (to simulate the ship hull noise emission); and
- Ground absorption.

The noise model outputs were compared with attended noise measurement results presented in Table 3.

Based upon the attended measurements, site observations and discussion with PON personnel, 'reasonable' worst case operational scenarios were established and modelled for the operations during the day, evening and night assessment periods, as per the requirements of Condition 5.11.

The sound power level inputs presented in Table 4 were used in the model and adjusted for duration and frequency of operations in accordance with Table 5. The plant item sound power levels were determined from the attended noise measurements of typical operations made on site. In order to determine compliance with the recommended noise limits, the predicted noise levels for each operational scenario were determined at each of the assessment locations. The results are presented in Section 3.5.

Modelling was undertaken using SoundPLAN noise modelling software. The assessment of each scenario considers a 'reasonable' worst case 15 minute operational period. The assumptions made for modelling purposes with regards to the equipment operating and the duration and frequency of operation during each 15 minute assessment period are presented in Table 5.

All assessment scenarios were modelled using a Pasquill stability class of D for the day-time assessment period and a Pasquill stability class of F for the evening and night-time assessment periods. A worst case source to receiver wind of 3 m/s for day, evening and night periods was assessed as per the Condition 5.11 requirements. The worst case predicted noise levels from either worst case wind or from worst case temperature inversion scenario are presented in Table 6.

Table 4 Mayfield No. 4 Berth plant items sound power levels

Plant item/operation	Sound power level, dB(A)
3 Forklift loading billets onto truck	106
Forklift in operation	105
Ship in dock – Main exhaust	106
Ship crane in operation	110
Truck Idle	93
Truck take-off	99

Table 5 Loading of CAT 785C trucks onto ship and loading of steel billets onto trucks assessment scenario

Plant item/operation	Number of plant	Total duration (minutes)
Forklift loading trucks	3	5
Forklift in operation	3	15
Ship in dock - Bow	1	15
Ship crane in operation	1	15
Truck idle	4	15
Truck accelerating	2	15 second acceleration period when on No. 4 Berth

3.5 Predicted operational noise levels

Table 6 presents the predicted noise levels at each of the assessment locations during the loading of CAT 785C trucks onto a ship and loading of steel billets onto trucks operational scenario and determine compliance with the noise limits presented in Section 1.1.

Table 6 Loading of CAT 785C trucks onto ship and loading of steel billets onto trucks

Location	Predicted noise level, $L_{Aeq\ (15\ min)}$, dB(A)	Criteria dB(A)	Compliance with noise criteria, dB(A)	Predicted noise level, $L_{Aeq\ (15\ min)}$, dB(A)	Criteria dB(A)	Compliance with noise criteria, dB(A)	Predicted noise level, $L_{Aeq\ (15\ min)}$, dB(A)	Criteria dB(A)	Compliance with noise criteria, dB(A)
	Day			Evening			Night		
1. 52 Arthur Street	36	49	Yes	36	38	Yes	37	38	Yes
2. Mayfield East Public School	33	47	Yes	33	37	Yes	34	37	Yes
3. 21 Crebert Street	38	49	Yes	38	39	Yes	39	39	Yes
4. Newcastle TAFE	31	44	Yes	31	38	Yes	32	38	Yes
5. 1 Arthur Street	25	48	Yes	25	33	Yes	26	33	Yes

The results presented in Table 6 indicate that the predicted noise impact at each of the five sensitive receiver locations complies with the required noise limits for all time periods.

4.0 Conclusion

Port of Newcastle Operations Pty Ltd (PON) commissioned AECOM Australia Pty Ltd (AECOM) to carry out noise compliance assessment measurements of associated operations at the Mayfield No. 4 Berth in Newcastle, NSW.

Condition 5.11 of the Consent Condition DA-293-08-00 MOD 9, dated 29 August 2013, requires that the facility demonstrates compliance with site noise limits at various noise sensitive receivers near the facility.

The major noise producing operations that take place at Mayfield No. 4 Berth are:

1. Containers being unloaded from ship onto the wharf;
2. Offloading of Ammonium Nitrate bulk-bags from ship; and
3. Container being loaded/unloaded from trucks prior to and after ship arrival/departure.

The noise impacts from 'reasonable' worst case operations of Mayfield No. 4 Berth were assessed at the five receiver locations specified in Condition 5.11 of the Consent Condition DA-293-08-00 MOD 9, dated 29 August 2013 which are representative of noise sensitive receiver locations in the surrounding area.

Attended measurements on 9 and 10 December 2021 established that it is not possible to determine the noise contribution from Mayfield No. 4 Berth by direct measurement at the assessment receiver locations. As direct measurement of noise from the premises was shown to be impractical, noise modelling using SoundPLAN software was used to determine compliance. This is in accordance with Chapter 11 of the NSW Industrial Noise Policy.

During the site visit, nearfield measurements of the vessel *BBC Naples – IMO NO. 9484223* and activities associated the loading of CAT 985C trucks onto the vessel were carried out on 9 December 2021. Additionally, activities associated with the loading of steel billets onto trucks was occurring concurrently and were also measured. The results of the nearfield measurements were used as inputs for the noise modelling in order to demonstrate compliance with the facility's noise limits.

Day, evening and night-time noise emissions were predicted at each of the required assessment locations and compared against the site noise limits. In accordance with the requirements of Condition 5.11 all scenarios were modelled using a Pasquill stability class of D for the day period and a Pasquill stability class of F for the evening and night periods, and a worst case source to receiver wind of 3 m/s for the day, evening and night periods was incorporated into the modelling.

The results of the modelling concluded that compliance is achieved at the five required assessment locations during all assessment periods.

Appendix A

Acoustic Terminology

Appendix A Acoustic Terminology

The following is a brief description of acoustic terminology that may have been used in this report.

Sound power level	The total sound emitted by a source
Sound pressure level	The amount of sound at a specified point
Decibel [dB]	The measurement unit of sound
A Weighted decibels [dB(A])	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB(A).
Decibel scale	The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:

0dB(A)	Threshold of human hearing
30dB(A)	A quiet country park
40dB(A)	Whisper in a library
50dB(A)	Open office space
70dB(A)	Inside a car on a freeway
80dB(A)	Outboard motor
90dB(A)	Heavy truck pass-by
100dB(A)	Jackhammer/Subway train
110 dB(A)	Rock Concert
115dB(A)	Limit of sound permitted in industry
120dB(A)	747 take off at 250 metres

Frequency [f]	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high-pitched sound and a low frequency to a low-pitched sound.
Equivalent continuous sound level [L_{eq}]	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.
L_{max}	The maximum sound pressure level measured over the measurement period
L_{min}	The minimum sound pressure level measured over the measurement period
L_{10}	The sound pressure level exceeded for 10% of the measurement period. For 10% of the measurement period it was louder than the L_{10}.

L_{90}	The sound pressure level exceeded for 90% of the measurement period. For 90% of the measurement period it was louder than the L_{90}.
Ambient noise	The all-encompassing noise at a point composed of sound from all sources near and far.
Background noise	The underlying level of noise present in the ambient noise when extraneous noise (such as transient traffic and dogs barking) is removed. The L_{90} sound pressure level is used to quantify background noise.
Traffic noise	The total noise resulting from road traffic. The L_{eq} sound pressure level is used to quantify traffic noise.
Day	The period from 0700 to 1800 h Monday to Saturday and 0800 to 1800 h Sundays and Public Holidays.
Evening	The period from 1800 to 2200 h Monday to Sunday and Public Holidays.
Night	The period from 2200 to 0700 h Monday to Saturday and 2200 to 0800 h Sundays and Public Holidays.
Assessment background level [ABL]	The overall background level for each day, evening and night period for **each day** of the noise monitoring.
Rating background level [RBL]	The overall background level for each day, evening and night period for the **entire length** of noise monitoring.
Weighted sound reduction index [R_w]	A single figure representation of the air-borne sound insulation of a partition based upon the R values for each frequency measured in a laboratory environment.

*Definitions of a number of terms have been adapted from Australian Standard AS1633:1985 *"Acoustics – Glossary of terms and related symbols"*, the EPA's Noise Policy for Industry and the EPA's NSW Road Noise Policy.

APPENDIX H – DANGEROUS GOODS RECORD

Environmental Management System

M4 Dangerous Goods Register

PORT of NEWCASTLE

ENVRG 013

Movement ID	Visit ID	Cargo/Product	Quantity (t)	Load / Unload	DG Class	Packing Specification	UN number	Date of Arrival	Time of Arrival	Date of Dispatch	Time of Dispatch	In-transit Time (hrs)	Dwell Time (mins)	Storage / Handling Method
360759000	360759	Ammonium Nitrate	1503	Unload	5.1	III	1942	12/01/2021	-	13/01/2021	-	-	2-5	Direct to trucks
361075000	361075	Ammonium Nitrate	2283	Unload	5.1	III	1942	1/02/2021	13:00	3/02/2021	8:15	43.25	2-5	Ship to trucks
361218000	361218	Ammonium Nitrate	6497	Unload	5.1	III	1942	18/02/2021	10:10	21/02/2021	10:45	72.6	2-5	Ship to trucks
361348000	361348	Ammonium Nitrate	5001	Unload	5.1	III	1942	1/03/2021	17:59	5/03/2021	14:42	92.7	2-5	Ship to trucks
361869000	361869	Ammonium Nitrate	6491	Unload	5.1	III	1942	4/05/2021	-	7/05/2021	-	-	2-5	Direct to trucks
362014000	362014	Ammonium Nitrate	6321	Unload	5.1	III	1942	19/05/2021	-	25/05/2021	-	-	2-5	Direct to trucks
362590000	362590	Ammonium Nitrate	3500	Unload	5.1	III	1942	14/07/2021	8:20	16/07/2021	11:18	50.58	0	Bulker bags to trucks
362638000	362638	Ammonium Nitrate	6516	Unload	5.1	III	1942	4/08/2021	21:04	8/08/2021	1:00	75.56	0	Direct to trucks
363153000	363153	Ammonium Nitrate	3000	Unload	5.1	III	1942	11/09/2021	6:35	13/09/2021	5:35	47	2-5	Direct to truck
363244000	363244	Ammonium Nitrate	6515	Unload	5.1	III	1942	27/09/2021	10:48	3/10/2021	6:35	140.79	2-5	Direct to truck
363392000	363392	Ammonium Nitrate	1800	Unload	5.1	III	1942	11/10/2021	15:40	14/10/2021	4:33	60.89	2-5	Direct to truck
363626000	363626	Ammonium Nitrate	6516	Unload	5.1	III	1942	2/11/2021	15:00	9/11/2021	20:54	173.9	2-5	Direct to truck
363739000	363739	Ammonium Nitrate	3000	Unload	5.1	III	1942	12/11/2021	3:54	16/11/2021	15:30	107.55	2-5	Direct to truck
363719000	363719	Ammonium Nitrate	4010	Unload	5.1	III	1942	15/11/2021	4:40	17/11/2021	3:54	47.92	2-5	Direct to truck
364051000	364051	Ammonium Nitrate	3000	Unload	5.1	III	1942	22/12/2021	17:03	24/12/2021	16:22	47.31	2-5	Direct to truck
364457000	364457	Ammonium Nitrate	6499	Unload	5.1	III	1942	29/01/2022	9:25	1/02/2022	13:48	76.23	2-5	Direct to truck