

TWEED VALLEY HOSPITAL MANAGEMENT PLAN - AIR QUALITY

20/06/2019 | Revision No: 7



Sub Plan Revision Status				
Date	Revision (in numbers)	Purpose and Summary of Amendments	Reviewed by	Approved by
30/01/17	2	General update including LLB GMR and legislative amendments.	[REDACTED]	[REDACTED]
12/09/18	2.1	Tweed Valley Hospital Project Specific Information	[REDACTED]	[REDACTED]
12/04/2019	2.2	Updated from SC Comments	[REDACTED]	[REDACTED]
24/04/2019	2.3	Updated for SSD Draft Conditions	[REDACTED]	[REDACTED]
09/05/2019	3.0	SSD Specific and HI Comments	[REDACTED]	[REDACTED]
21/05/2019	4.0	SSD Draft V3 and Certifier Comments	[REDACTED]	[REDACTED]
22/05/2019	5.0	SSD Draft V5	[REDACTED]	[REDACTED]
17/06/2019	6.0	Final SSD Stage 1 Condition	[REDACTED]	[REDACTED]
20/06/2019	7.0	Council Consultation Feedback Incorporated	[REDACTED]	[REDACTED]
12/09/201	8.0	Independent Auditor Feedback Incorporated	[REDACTED]	[REDACTED]

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1. SSD CONDITIONS

State Significant Development Conditions

Name of this Plan (as per SSD Conditions): Construction Air Quality Management and Dust Management Sub-Plan (CAQDMSP)

B32. The Construction Air Quality Management and Dust Management Sub-Plan (CAQDMSP) and the plan must address, but not be limited to the following:

<p>(a) be prepared by a suitably qualified expert, in consultation with NSW EPA and the Council;</p>	<p><u>Report prepared by:</u> [REDACTED] – Lendlease Site Environmental Engineer</p> <p><u>Report prepared in accordance with recommendations made in:</u> Tweed Valley Hospital Development - Biodiversity Development Assessment Report - Greencap Tweed Valley Hospital Development - Biodiversity Management Plan – Greencap Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales – EPA EIS Mitigation Measures Table – Appendix 2</p> <p><u>Report Reviewed by:</u> NSW EPA – Review Appendix 3 Council – Review Appendix 4</p>
<p>(b) describe the measures that would be implemented on site to ensure:</p> <p>(i) the control of air quality and odour impacts of the Development; during rock crushing and piling activities;</p> <p>(ii) that these controls remain effective over time;</p> <p>(iii) that all reasonable and feasible air quality management practice and measures are employed, with specific reference to the rock crushing and piling activities, including the relevant measures listed in Appendix 2 of this document;</p> <p>(iv) the air quality impacts are minimised during adverse meteorological conditions and extraordinary events; and</p> <p>(v) compliance with the relevant conditions of this consent.</p>	<p>(i) Section 3: Implementation of the Sub plan</p> <p>(ii) Quarterly review of CAQDMSP, review of monitoring data, or as needed depending on work activity.</p> <p>(iii) Items from Appendix 2 detailed in Appendix 3 of this plan. Details within Section 3: Implementation of the Sub plan</p> <p>(iv) Section 2: Scope of Project and Sub plan & Section 3: Implementation of the Sub plan</p> <p>(v) Compliance Auditing Report</p>
<p>(c) include performance objectives for monitoring dust and ensuring no off-site air quality impacts to users of Kingscliff TAFE, and nearby residences and other businesses;</p>	<p>Visual monitoring of air quality to verify the effectiveness of controls and enable early intervention;</p> <p>Public roads and entrances to nearby residences and other businesses and will be inspected each day at main entry and exit points (and near high generating activity) to and from areas where construction activities are taking place and compound. Material tracked onto the road pavement will be removed.</p> <p>Dust levels are to be monitored to measure existing background levels. Monitoring equipment will remain in place until completion of the construction works and/or where ground conditions are stable. Results will be captured</p>

	monthly and collected in accordance with DEC's "Approved Method for the Sampling and Analysis of Air Pollutants in NSW" guidelines.
<p>(d) includes an air quality monitoring program that:</p> <p>(i) can evaluate the performance of the construction works;</p> <p>(ii) includes a protocol for determining any exceedances of the relevant conditions of consent and responding to complaints;</p> <p>(iii) adequately supports the air quality performance objectives; and</p> <p>(iv) evaluates and reports on the effectiveness of air quality management for the construction works.</p>	<p>Section 2: Scope of Project - Summary of Site Controls</p> <p>Community Consultation Strategy prepared by HI.</p>
<p>(e) details on monitoring weather conditions and communicating changing conditions to the workforce; and</p>	<p>Site staff are to subscribe to the Bureau of Meteorology (BoM) for regular updates on weather events.</p> <p>EHS Regional Managers sends alerts to Site Manager and Safety Committee organised to address actions required.</p> <p>Site Manager is to perform daily checks on BoM and State Emergency Services (SES) – New South Wales</p> <p>Notification and Warnings to be included in Daily Builders Briefs to all Construction Workers</p>
<p>(f) stop work procedures if performance objectives are not being met.</p>	<p>If it is determined that works are generating excessive amounts of dust, the site manager will enforce dust generating works to cease until the correct mitigation measures (i.e. water cart, sprinklers, dust suppressants) are utilised.</p>
<p>B25: Environmental Management Plan Requirements - Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:</p>	
<p>(a) detailed baseline data;</p>	<p>Not Available</p>
<p>(b) details of:</p> <p>(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);</p> <p>(ii) any relevant limits or performance measures and criteria; and</p> <p>(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</p>	<p>i) Refer to Section 2: Scope of Project and Sub Plan. Subheading: Legislation, Approval and Guidelines</p> <p>ii) As determined after consultation with EPA and council.</p> <p>iii) Visual inspection and community complaints.</p>
<p>(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;</p>	<p>Refer to Section 3: Implementation of the Sub plan</p>

<p>(d) a program to monitor and report on the:</p> <p>(i) impacts and environmental performance of the development; and</p> <p>(ii) effectiveness of the management measures set out pursuant to paragraph (c) above.</p>	<p>Plan to be prepared by trade specific subcontractor which will set out frequency of reports.</p> <p>The details of monitoring proposed by subcontractor are to be incorporated into this plan.</p>
<p>(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;</p>	<ol style="list-style-type: none"> 1. Stop work protocol. 3. Incorporate Air and Dust Pollution minimisation measures.
<p>(f) a program to investigate and implement ways to improve the environmental performance of the development over time;</p>	<p>Quarterly review of CAQDMSP, review of monitoring data, or as needed depending on work activity.</p>
<p>(g) a protocol for managing and reporting any:</p> <p>(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);</p> <p>(ii) complaint;</p> <p>(iii) failure to comply with statutory requirements; and</p> <p>(iv) a protocol for periodic review / update of the incidents or matters of non-compliance.</p>	<p>Refer to Section 5.3 of the Construction Environmental Management Plan (CEMP) and the Community Consultation Strategy prepared by HI.</p>

C26. The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent, including avoiding rock crushing where possible and reuse of the boulders in the construction works and / or landscaping of the Site.

Refer to Section 2: Scope of Project

C27. During construction, the Applicant must ensure that:

- (a) exposed surfaces and stockpiles are suppressed by regular watering;
- (b) all trucks entering or leaving the site with loads have their loads sealed and covered;
- (c) trucks associated with the development do not track dirt onto the public road network;
- (d) public roads used by these trucks are kept clean;
- (e) land stabilisation works are carried out progressively on site to minimise exposed surfaces; and
- (f) minimise air quality impacts of the project during adverse meteorological conditions.

Refer to Section 3: Implementation of the Sub plan

C28. The Applicant must install and operate equipment in line with best practice to ensure that the construction works comply with all load limits, air quality criteria / air emission limits and air quality monitoring requirements as specified in the CAQMSP required by condition B30 of Schedule 3.

Refer to Section 3: Implementation of the Sub plan - Combustion Emission Controls

C29. Dust deposition monitoring must be undertaken during the construction works (as per AS/NZS 3580). This would include monitoring points in appropriate locations on the Site boundary. Monitoring locations must include sensitive receivers that are most likely to be affected. The locations and frequency of the monitoring are to be detailed within the CAQMSP.

Refer to Appendix B: Approximate Location of Dust Monitors



2. SCOPE OF PROJECT AND SUB PLAN

Project Details	
Scope of the Sub Plan	<p>This Air Quality Management Sub Plan provides strategies and mitigation measures to minimise and control the generation of dust, odour and emissions to the environment during site establishment, Early Works and delivery of Main Works of the project.</p> <p>Refer to Section 1.1 and 3.1 of the Project EHS Management Plan for clarification on how the EHS Sub Plans form part of the Lend Lease Building (LLB) EHS management system.</p>
Objectives of the Sub Plan	<ul style="list-style-type: none"> ● To prevent emissions to the environment (air). ● To maintain current levels of local air quality during construction activities. ● To provide an adequate monitoring regime to allow real-time assessment of various dust/odour generating construction activities on the site. ● To prevent nuisance and ecological impacts (associated with air emissions) on the local community and environment. ● To achieve compliance with the project approval.
Scope of Works	<p>This Sub Plan has been prepared based on the following scope of works:</p> <ul style="list-style-type: none"> ● Site establishment including ATF, fixed temporary fence and hoarding installation, office and compound setup; ● Infrastructure services works to provide the site with all utilities required to perform construction activities; ● Increased site establishment including vegetation removal, topsoil stripping, ● Excavation of pits for sewer diversion work, trenching and drilling work. ● Bulk excavation works including basalt rock excavation; ● Civil Works, including haul roads, carparks, trunk services/infrastructure; ● Monitoring and maintenance of existing Sedimentation Basins; ● Installation of bored piers for the Main Hospital Building; ● Construction of a multi-level Acute Services Building (Main Works Stage). This new build will include a new emergency department, helipad, IPUs, ICU, MAU, expanded rehab and ambulatory care facilities and operating theatres

<p>Key Issues and Risks</p>	<p>The works described above have the potential to generate dust, odour and emissions primarily associated with:</p> <ul style="list-style-type: none"> • Ground disturbance, site clearing and grubbing; • Traffic movements and plant operation; • Rock excavation; • Rock crushing (for recycling on site, if viable) • Bored piles; • Spoil handling and stockpiling; • Storage and handling of materials; and • Disturbance/remediation of contaminated soil or groundwater (odour). <p>Compliance with the Project EHS Plan and this Air Quality Management Sub Plan is intended to mitigate the risks and potential impacts of these activities on air quality. If appropriate controls are not implemented and maintained on the site, the potential exists for construction related air emissions to:</p> <ul style="list-style-type: none"> • Cause a nuisance or health effects to the local community; • Result in complaints; • Impact on the natural environment; or • Create unsafe working conditions. <p>The closest receptors to the site are located (Appendix A):</p> <p>Catchment Area A</p> <ul style="list-style-type: none"> • Residential <ul style="list-style-type: none"> - Kingscliff High School to the southeast (closest and most affected educational receiver) - Kingscliff Library to the northeast • Passive Recreation Area - Jack Julius Park • Commercial including <ul style="list-style-type: none"> - Kingscliff Community Health Centre
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	<ul style="list-style-type: none"> - Civic Swimming Pool - Life Bridge Australia <p>Catchment Area B</p> <ul style="list-style-type: none"> • Residential • Educational – North Coast TAFE Kingscliff Campus (TAFE) • Agricultural / Commercial <p>Catchment Area C</p> <ul style="list-style-type: none"> • Residential • Agricultural <p>A&B Hydroponics (west boundary);</p> <p>The set out of the site compound including the location of the site access, internal roads, carparking, waste collection, storage and stockpile areas, and the planning of new works will consider these receptors. The planned location of heavy equipment/machinery and topography of the site works favourably to reducing potential impacts of construction activities on their operation and property.</p> <p>NOTE: Background air quality data may be required to facilitate an assessment of construction impacts on local air quality. This may necessitate monitoring prior to the commencement of construction if local air quality data is unavailable and should be considered in the construction program.</p>
<p>Legislation, Project Approval and Guidelines</p>	<p>Federal/National/State and Local:</p> <ul style="list-style-type: none"> • National Environment Protection (Ambient Air Quality) Measure (NEPM) 1998 • AS 3580.14:2014 Methods for Sampling and Analysis of Ambient Air – Meteorological monitoring for ambient air quality monitoring applications • DR 102288 CP Methods for sampling and analysis of ambient air Part 14 - Meteorological monitoring for ambient monitoring applications • AS 3580.1.1:2007 Methods for Sampling and Analysis of Ambient Air - Guide to Siting Air Monitoring Equipment • National Environment Protection Council’s (NEPC) – NEPM for Ambient Air Quality Guidelines • Protection of the Environment Operations (Clean Air) Regulation, 2002 • AS 2922 Ambient Air Guide for Citing of Sampling Equipment • Air Quality Monitoring Criteria for Deposited Dust (DEC Guideline). • NSW Workplace Health and Safety Act 2011

	<ul style="list-style-type: none"> • NSW Workplace Health and Safety Regulation 2017 • Protection of the Environment Operations Act 1997 • Environmental Planning & Assessment Act 1979 • Protection of the Environment Operations (Waste) Regulation 1996 • Environmentally Hazardous Chemicals Regulation 1994 • AS 3580.10.1-2003 Methods of Sampling Analysis of Ambient Air • Action for Air 2009 (NSW DEC) • Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005) • Local Government Act 1993 <p>Lendlease requirements:</p> <ul style="list-style-type: none"> • GMR 4.10: Occupation Health Exposure (for unexpected findings); • GMR 4.13: Degradation or Pollution of the Environment • GMR 4.15: Uncontrolled Release of Stored Energy (non-electrical)) • Lendlease Building Workplace Delivery Code (WDC)
Summary of Site Controls	<p>Works must be undertaken in accordance with the Lendlease GMRs, the Project EHS Plan, this Sub Plan and the Lendlease Building WDC. These documents detail Lendlease’s approach and commitment to pro-active and responsible site management.</p> <p>Site specific controls, monitoring, reporting and performance measures have been identified in this Sub Plan to prevent or minimise the impacts of construction related air emissions on the environment and community. These may include but are not limited to:</p> <ul style="list-style-type: none"> • Clear definition of trafficable and material storage areas to prevent unnecessary vehicle movement into other areas; • Use of water cart to dampen work areas and exposed soils to prevent the emission of excessive dust; • Installation of a wheel shaker grid and/or wash down facilities at the vehicle egress point; • Ensuring trucks transporting materials to and from the site use covers to prevent windblown dust or spillage; • Ensuring truck tailgate locking mechanisms are operational and in use; • Periodic inspection of surrounding roads to ensure no construction contamination and initiation of road sweeping if required; • Careful selection of materials for temporary road surfacing; • Watercarts/water trucks will be in permanent use on site during excavation and civil works.

- Temporary stockpiles that are not required for imminent use will be stabilised with spray grass or appropriate fabric.
- Continuous monitoring of weather forecast to stop dust generating activities in case that high winds are expected.
- Before extended breaks (e.g., Easter, Christmas), areas will be treated with spray grass.
- Only those areas where immediate structures are to be build will be stripped. Areas will be stripped at the latest possible date to comply with the program.
- Construction haul roads and temporary carparking will maximise the use of permanent infrastructure. These roads/carparks will have a sacrificial seal to minimise dust generation.
- Subcontractors to maintain equipment / machinery to ensure exhaust emissions comply with relevant legislation and guidelines;
- All waste material to be sorted, collected and removed from site (for recycling where possible);
- If rock crushing is assessed to be safe and feasible (i.e. cost effective and meets Nosie restrictions) the following management provisions will be in place:
 - rock crushers will have a water attachment for dust suppression at the source. The water is sprayed at the face of the crusher before, during and after the crushing.
 - Crushers will be located as far as practicable from Cudgen Road and immediate neighbours (i.e., on the north-west area of the site).
 - All crushed rock suitable for re-use will be recycled on site as fill, sediment control, pavements, hardstands, construction exits and pipe bedding materials.
 - Where possible, the oversize material from hard rock projects is also reused for vehicle entry shake downs and erosion control.
- Air quality monitoring is required for dust only. Given all plant and equipment will be fitted with air filter caps, analytical air quality monitoring except for asbestos works and confined space is not required;
- Dust screens and airlocks to be utilised with interior works;
- Controlling dust close to its source by installing sprays and sprinkler systems to prevent off-site migration; and
- Maintaining the site access to prevent dust generation and tracking off-site.
- No blasting will be performed as part of the proposed construction works program.

Demolition (e.g., existing inground services), excavation and construction stage dust, odour and emission management requirements must be included in relevant specifications, contract agreements, quality assurance documents, and subcontractor work method statements.

Site inspections, monitoring and reporting will be undertaken by Lendlease and subcontractors as detailed in the Project EHS Plan and the following implementation table to ensure controls remain effective overtime.

Location of Monitoring Equipment	Monitoring logs will be in place during high risk works <ul style="list-style-type: none">• 3 No. along the Cudgen Road site boundary (to monitor the emissions close to the TAFE, residents and businesses).
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3. IMPLEMENTATION OF THE SUB PLAN

Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
Planning and Site Establishment					
Include information in the Site Induction about the risks and potential impacts of dust and emissions on the environment and community.	Before works commence and ongoing	Revise Lendlease induction package to include site specific information.	CM/SM	Subcontractor WMSs address dust, odour and emissions control	Site induction delivered to all workers on site.
Design, document and implement an agreed air quality monitoring program, where required.	Prior to commence of high risk areas	Confirm requirement for background and/or construction stage monitoring (as per project approval or contract). Engage consultant (NATA accredited).	CM	Results of air quality monitoring program. Reports for approval authority or Client as required.	Monitoring performed correctly and accurate data available. Monitoring undertaken by a NATA accredited consultant.
Stop work Procedure if performance objectives are not being met	During High Risk works	Regular monitoring of devices. Signal type to be distinguished during site induction.	SM	Reports for approval authority or Client as required. Incident Log.	Limit duration of works causing deference from performance objectives.
Prepare a site-specific Air Quality Management Diagram.	Prior to works commencing. Ongoing review.	Prepare diagram showing sensitive receivers, monitoring locations, device type, waste/ storage/contaminated areas etc.	CM	Diagram referenced in the planning of the site and new works. Review of diagram prior to works commencing.	Diagram covers all key areas and site-specific operation.
Install fabrics to perimeter fencing and wind barriers at internal excavation boundaries.	Site establishment and ongoing	Identify and install hoardings/ shade cloth considering the location of neighbours, key work zones and prevailing winds. Mark on Air Quality Environmental Management Diagram (Appendix 1).	SM/ Foreman	Daily fencing/hoarding inspection checklist. Weekly/monthly inspection checklist.	Number of complaints.

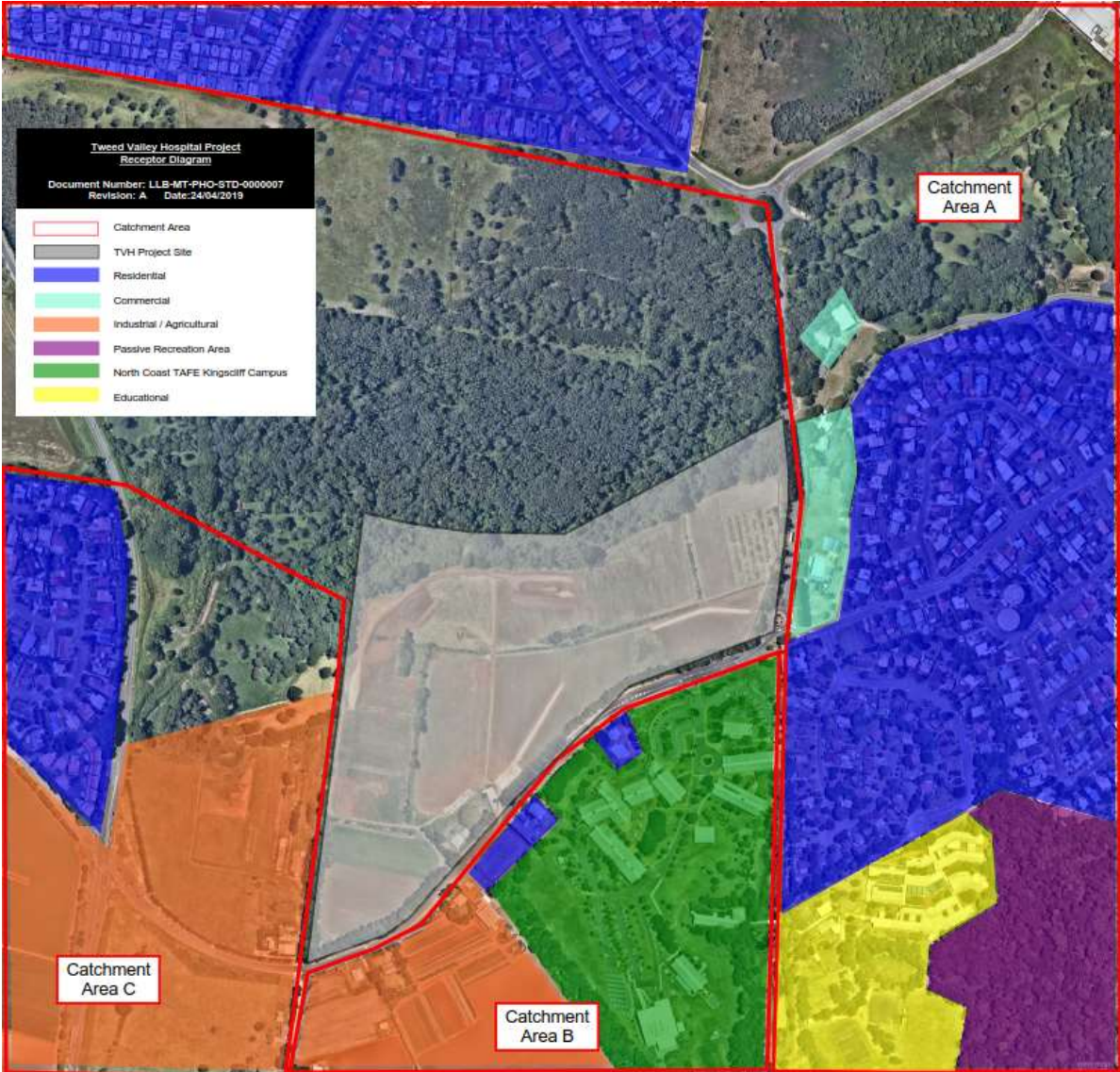
Seal or construct the site access, roads, turning and parking areas using gravel or non-dust generating materials.	Prior to construction commencing	Retain hardstand areas where existing. Construct new stable areas using road base as a minimum. Install wheel shaker facility	SM	Pre-construction inspection. Weekly/monthly inspection checklist.	No dust generation associated with vehicle movements. No tracking of materials onto public roads.
Staging of stripping to an as need basis.	Prior to construction commencing	Identify which areas will need to be stripped for works to occur (i.e. building footprint, slip lane area, roadways).	CM/SPE/S M/SE	Staging Plan	Limit dust generation from vegetation removal.
Dust Control During Construction					
Regular monitoring of weather and news updates to ensure site is adequately managed to minimise air quality impacts.	During Construction	Set up alert notification.	SM	Daily review and if necessary notification in daily builder brief	Minimal air quality impacts during adverse meteorological conditions and extraordinary events
Limit speed to 20km/hr on internal roads and access ways to reduce dust and vehicle emissions.	During construction	Install speed limit signage.	SM	Daily surveillance to monitor vehicle speed. Reminders in daily builder brief	Minimal dust generated by traffic on construction roads/access. No speeding vehicles.
Maintain the site access and traffic routes in a clean, dust free condition.	Ongoing	Maintain shaker grid for site heavy duty plant. Engage sweeper. Limited hosing of hard surfaces only. Clean up spilled soil immediately.	SM	Daily inspection of site access and local roads. Weekly/monthly inspection checklist. Inspections immediately after rainfall events.	No complaints from public or authorities. No dust generated on public roads.
Avoid excavation and handling during periods of high wind and extreme (wet) weather conditions.	As required	Only enter areas that need to be worked. Work in areas away from sensitive receptors.	SM	Constant surveillance during unfavourable conditions. Monitor meteorological reports.	No works performed during high wind or rainfall events. No complaints.

		Maintain site access controls and clean roadways. Stop work until conditions are more favourable if dust and/or tracking cannot be controlled.			
Reduce requirements for the handling and stockpiling of excavated materials.	At all times	Pre-test and validate soils to enable direct transport off-site (rather than stockpiling). Dampen down materials during handling.	SM/ Foreman	Include requirements in tenders for subcontractors. Daily surveillance of activities.	Controls maintained and effective.
Locate and maintain stockpiles to minimise wind erosion and dust.	At all times	Locate stockpiles away from sensitive receptors. Keep stockpiles to a manageable size and cover. Keep exposed surfaces moist and compacted to reduce erosion potential. Stabilise or cover stockpiles left for >4 weeks.	SM	Daily surveillance. Weekly/monthly inspection checklist.	No visible dust from stockpiles. No reported dust complaints or exceedances.
Dampen down exposed areas and activities with the potential to create dust (eg excavation faces, handling areas, stockpiles etc)	At all times	Identify the risk of dust/nuisance impacts (IHRA) associated with key activities/areas. Establish appropriate watering/fogging/misting/spray systems to control dust at the source.	CM/SM	Daily surveillance. Weekly/monthly inspection checklist. Monitoring results.	Limited dust generation. No complaints.
Cover trucks transporting loose material to prevent dust generation and spills.	At all times	Include in subcontractor WMS. Cover all loads. Clean up spills immediately.	SM/ Foreman	Vehicle inspection prior to entering and leaving the site.	No visible loose material. No community complaints.
Undertake progressive stabilisation and landscaping of disturbed areas	Ongoing	Incorporate rehabilitation activities into the construction program if possible.	CM/SM	Weekly/monthly inspection checklist.	Disturbed areas stabilised.

(particularly over long breaks i.e. Christmas, Easter).		Apply temporary and/or permanent vegetation and mulch to stabilise.		Project planning and design meetings.	No areas left exposed for prolonged periods.
Prevent build-up of silt and other materials within erosion control structures through regular inspections.	At all times	Include in SM checklist. Onus on subcontractor that installed the device to maintain.	SM/ Foreman	Daily surveillance. Weekly/monthly inspection checklist.	No build-up of silt and other materials within erosion control structures
Air Quality Controls (Contamination/Hazardous materials)					
Prevent potentially contaminated dust being generated during the disturbance and handling of contaminated soil.	At all times	Identify contaminated areas on the Air Quality Management Diagram (required above). Engage a specialist environmental consultant (as required). Implement recommended controls eg spray systems. <i>Refer to Contaminated Soil and Water Management Sub Plan.</i>	SM	Dust monitoring results. Soil test results.	Dust controlled. No contaminants detected in dust monitoring samples.
Control odour generation related to contamination including Volatile Organic Compound (VOC) vapours within work areas.	At all times	Engage a specialist hygienist/ environmental consultant (as required). Use VOC permit Implement dampening and monitoring as recommended.	CM/SM	Air vapour monitoring (and personal air monitoring if required) during and after works.	No elevated VOCs detected during works. No works performed whilst elevated VOCs are detected in work areas.
Combustion Emission Controls (TSP, PM10, NOx, CO and BTEX)					
Burning of waste on site is banned.	At all times		SM	Daily surveillance.	No fires or incineration on site.
Fit plant and equipment with emission control devices and maintain.	At all times	Include requirements in subcontractor documents.	SM	Routine and random inspections of plant.	Copies of service records and/ or inspection to be supplied.

		Documented plant condition inspections by subcontractors. Verify than plant/equipment has been regularly maintained to minimise visible smoke and emissions.		Emissions not visible for >10secs (as a rule).	No complaints from site personnel or neighbours.
Turn equipment and plant engines off when not in use for extended periods.	At all times	Address in contractor's WMS.	SM	Daily surveillance.	No excessive (visible) emissions or odour.

Appendix 1: Surrounding Land Uses



Appendix 2: Approximate Location of Dust Monitors



Appendix 2 – SSD Environmental Mitigation Measures

Air Quality and Dust

To manage air quality and dust related impacts mitigation measures such as the following would typically be contained within the site CEMP:

- All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the contractor shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of relevant works if no alternative available.
- Prior to construction activities, training will be provided to all project personnel, including relevant sub-contractors on sound air quality control practices and the requirements of the relevant Air Quality / Dust Management Plan (to be prepared by the contractor prior to commencement) through inductions, toolboxes and targeted training.
- An Air Quality and Dust Management Plan as a sub-plan of the Construction CEMP will be prepared by the contractor. The objective of the Management Plan would be to ensure that impacts on air quality are minimised. To achieve this objective, the following would be addressed:
 - Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise air quality impacts and potential adverse impacts to nearby sensitive receivers
 - Ensure appropriate measures are implemented to address the mitigation measures detailed in the EIS and applicable conditions of approval
 - Ensure appropriate measures are implemented to comply with relevant legislation and guidelines. Guidelines and standards relevant to air quality and the development of an associated management plan include the following publications:
 - National Environment Protection Council's (NEPC) – NEPM for Ambient Air Quality Guidelines
 - Protection of the Environment Operations (Clean Air) Regulation, 2002
 - AS 2922 Ambient Air Guide for Citing of Sampling Equipment
 - AS 3580.1.1-2007 Methods for Sampling and Analysis of Ambient Air – Guide to Siting Air Quality Monitoring Equipment
 - AS 3580.10.1-2003 Methods of Sampling Analysis of Ambient Air
 - Action for Air 2009 (NSW DEC)
 - Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005)
 - Air Quality Monitoring Criteria for Deposited Dust (DEC Guideline).

Additional measures to reduce air and dust impacts could include:

- Construction activities will be modified, reduced or controlled during high or unfavourable wind conditions if they have a potential to increase dust generation
- Control measures including water carts, sprinklers, sprays, dust screens or the application of geo-binding agents will be utilised where applicable to control dust emissions. The frequency of use will be modified to accommodate prevailing conditions. Dust control equipment will be maintained to ensure its operability
- Erosion control structures will be checked regularly for build-up of silt and other materials to ensure deposits do not become a dust source
- Waste will be segregated and collected on a regular basis
- No waste will be burnt on-site
- Stormwater, recycled water or other water sources shall be used, where feasible and reasonable, in preference to potable water for construction activities, including concrete mixing and dust control.
- Watercarts/water trucks will be in permanent use on-site during excavation and civil works.
- Temporary stockpiles that are not required for imminent use will be stabilised with spray grass or appropriate fabric.
- Continuous monitoring of weather forecast to stop dust generating activities in case that high winds are expected.
- Before extended breaks (e.g. Easter, Christmas), areas will be treated with spray grass.
- Only those areas where immediate structures are to be built or works required will be stripped. Areas will be stripped at the latest possible date to comply with the program.

- Construction haul roads and temporary carparking will maximise the use of permanent infrastructure. These roads/carparks will have a sacrificial seal to minimise dust generation.
- Areas of disturbed material and access roads will be stabilised where possible using appropriate methods.
- Measures implemented to minimise dust, soil or mud from being deposited from vehicles on public roads. This will be achieved through rumble grids and large aggregate at entry/ exit points.
- Manual cleaning will also be carried out where appropriate. In the event of any spillage or tracking, the spilt material will be removed within 24 hours.
- Hardstand areas and surrounding public roads will be cleaned as required.

Rock Crushing and Stockpiles

While the type and size of rock crushers are yet to be determined the management plan for the site would typically include:

- Rock crushers will have a water attachment for dust suppression at the source. The water is sprayed at the face of the crusher before, during and after the crushing.
- Crushers will be located as far as practicable from Cudgen Road and immediate neighbours (i.e., on the north-west area of the site).
- All crushed rock suitable for re-use will be recycled on-site as fill, sediment control, pavements, hardstands, construction exits and pipe bedding materials.
- Where possible, the oversize material from hard rock projects is also reused or vehicle entry shake downs and erosion control.
- Excavated surplus material will be temporarily stockpiled within the landscaped areas with appropriate dust, soil and water management controls. These controls will be further determined with the contractor (as they are dependent on proposed building methodology and staging) and comprehensively documented in the CEMP for the Project along the following principles:
 - Construction Traffic:
 - The contractor will implement a truck movement assessment and devise a methodology that reduces the intensity and timing of the fill deliveries/movements. This will include an assessment of peak traffic times and options to spread out the number of truck movements over longer durations.
 - Reduce volume of stockpiling:
 - One approach to mitigate negative effects of stockpiling is to reduce the volume of stockpiling required in the first instance. An "only as required" approach to stockpiling will be implemented which will reduce the volume of stockpiling on site at any given time.
 - Stockpiles would be located in accordance with a Stockpile Management Protocol.
 - Dust management:
 - Appropriate dust control measures will be implemented for example wetting down with recycled water and any times stockpiles that are uncovered. Whenever practical, height of stockpile mounds to be reduced to mitigate impact of wind and run off water.
 - Stormwater runoff management:
 - Dependant on the duration of stockpile, the contractor would apply a combination hydro-mulch and or geo-textile wrap over any fill being stockpiled. These measures will also assist in stabilising the outlet layer of the stockpile and will control the creation of dust.
 - Stockpile locations will have temporary run off water channels connected to the site temporary stormwater system which is connected to sediment basins.
 - Truck movements and pedestrian safety:
 - Appropriate separation, access routes, pedestrian protection (i.e. water barriers and crossing points) will be implemented into the site traffic management plan to ensure safe pedestrian movements are maintained during stockpiling and material redistribution.

Appendix 3 – EPA Consultation

Appendix 4 – Council Consultation