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Title of the Report

DUST MANAGEMENT PLAN

Dust Management Plan

Goyder Wind Farm

Green Light Contractors, Elecnor Group

succession ecology

PROJECT SPECIFICATION

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- Luke Wagenknecht (Research and Drafting)
- Briony Horner (Management and Review)

ACRONYMS

CEMP	Construction Environment Management
DMP	Dust Management Plan
DNF	Decision notification form
EP Act	Environment Protection Act (SA)
EMS	Environmental Management System
EWMS	Environmental Work Method Statement
GLC	Green Light Contractors
GWF	Goyder Wind Farm
HSE	Health Safety and Environmental Manager
LRP	Landscape and Revegetation Plan
MW	Mega Watts
PV	Photo Voltaic
RMP	Rehabilitation Management Plan
RUSLE	Revised Universal Soil Loss Equation
SEDMP	Soil Erosion and Drainage Management Plan
SMP	Stormwater Management Plan
TMP	Traffic Management Plan
TSP	Total Suspended Particulate
VA	Vegetation Association

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1. INTRODUCTION

1.1 Background

The Goyder South Hybrid Renewable Energy Facility, to be developed south of Burra (Figure 1), is a hybrid power station comprising up to 1,200MW of wind generation, up to 600MW of solar PV generation and up to 900MW/1,800MWh of battery storage. As well as providing a significant injection of renewable energy generation for the State, the proposed connection point near Robertstown means that the project's large-scale battery would be in an ideal position to inject emergency power and fault current into the South Australian grid in the event of a fault impacting the proposed SA-NSW interconnector and enable the continued stable operation of the South Australian grid in any subsequent separation from the NSW grid.

Neoen Australia Pty Ltd has sought Development Authorisation for the Goyder South Hybrid Renewable Energy Facility (Goyder South) pursuant to section 49 of the *Planning, Development and Infrastructure Act 2016* (SA). Approval was issued by the South Australian Minister for Planning and Local Government and Planning, dated 3 March 2021. Neoen is also submitting applications under the relevant legislation as a concurrent process with the Development Application to address all regulatory requirements for the project.

The project has been divided into three separate stages, each comprising 400MW wind, 200MW solar and 300MW/600MWh storage. The size and composition of each stage depends on the size and type of the demand from electricity customers. This will be communicated through approved engineering plans prior to site works commencing for each stage. Given the scale of the project stages, the development timeframes will be structured on a 'rolling' basis with construction of the entire project be completed within 12 years from the date of the approval.

Green Light Contractors (The Contractor) have been engaged as the Contractor to carry out the Goyder Wind Farm (GWF) aspect of this development, being Stage 1 (Figure 2). These works will be divided into two stages (1A and 1B), 38 and 37 turbines respectively.

A Construction Environmental Management Plan (CEMP) has been developed for GWF Stage 1 in response to legislative and approval requirements. This document outlines the environmental management and mitigation measures, associated with the construction phase of the project. The primary objective of the CEMP is to reduce any associated adverse environmental impacts and satisfy regulatory requirements. It provides a framework for actions, responsibilities and protocols associated with environmental management with which the Proponent and their Contractors are required to adhere. A series of sub-plans (including this Dust Management Plan) describes additional details for implementation of mitigation actions on the project site.

1.2 Purpose

The Dust Management Plan (DMP) describes procedures that will be implemented during construction of GWF stage 1 to meet the dust management and mitigation objectives associated with the Development Approval. The plan provides a description of the methods to be used to minimise dust production and stabilise the landforms created across the GWF Stage 1. In addition, it outlines a program for monitoring dust minimisation outcomes.

1.3 Objectives

The objective of this plan is to:

- Identify the relevant legislative and regulatory requirements and Development Approval conditions guiding dust management.
- Acknowledge the risk that dust poses to human health and the environment and the need for dust management.
- Describe the construction situations that will lead to a requirement for dust management and site stabilisation.
- Provide a framework around which work plans and practices can be developed to support the dust management methods to be applied on site.
- Describe the methods that will be applied on site to minimise dust production.

- Establish a monitoring program with appropriate indicators for assessing dust production.

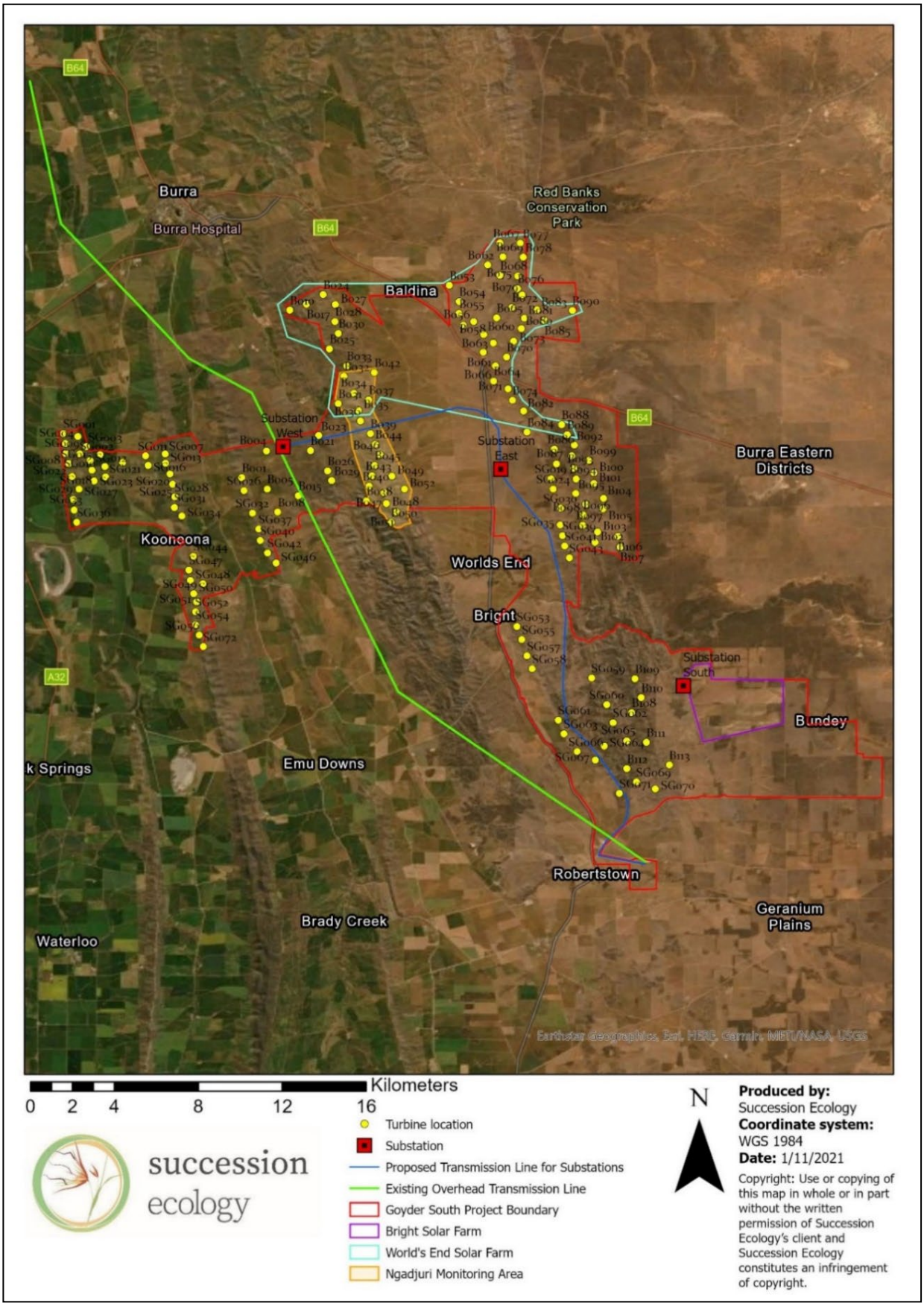

Figure 1: The Goyder South Hybrid Renewable Energy Facility, located south of Burra, including wind, solar and battery storage.

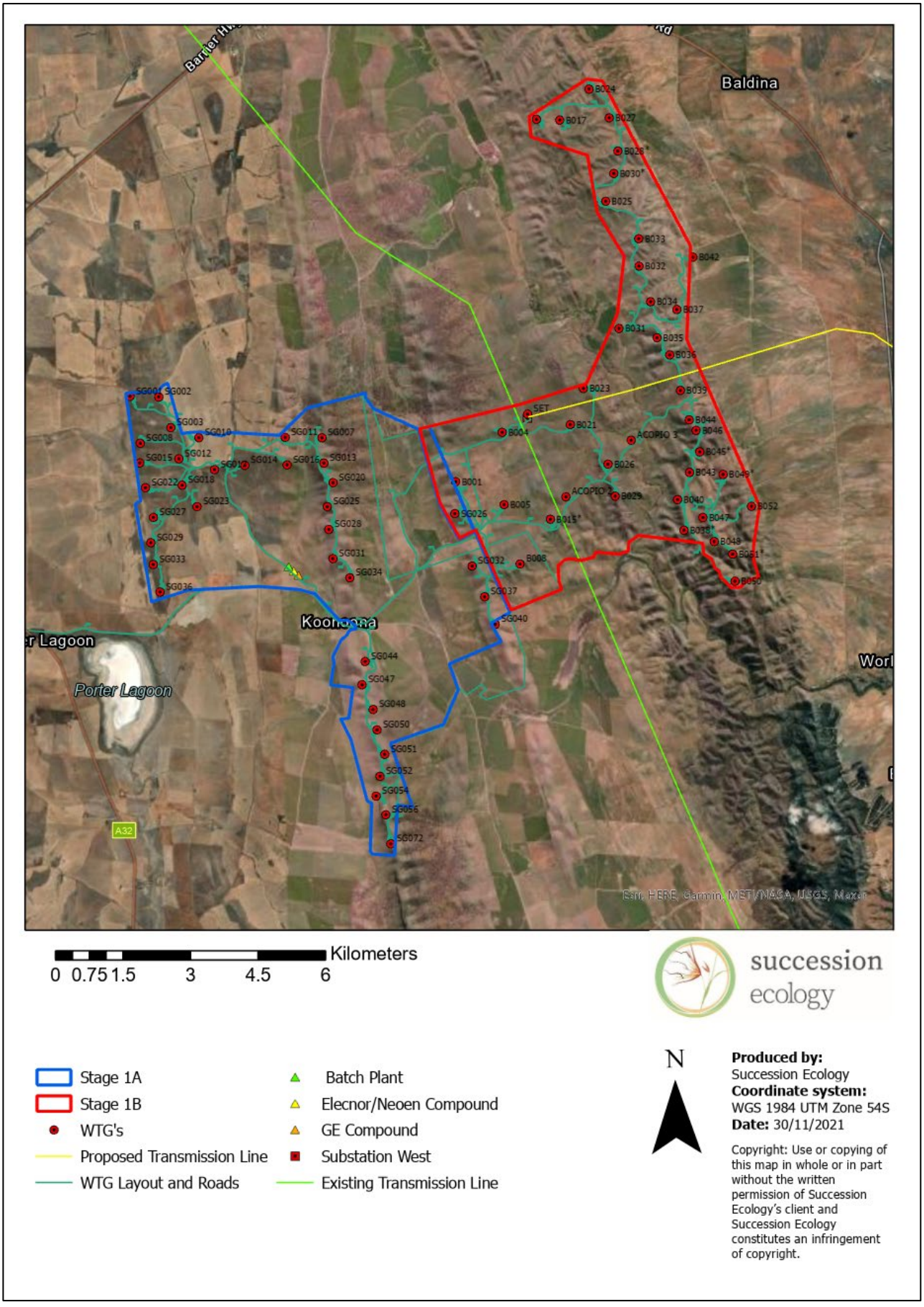

Figure 2: Goyder Wind Farm Project Area and Proposed Turbine Layout.

2. DUST PRODUCTION IMPACTS

2.1 Sources of Dust production

Dust movement in the broader region of GWF Stage 1 is expected due to moderately erosive soil types and current land use practices. These existing drivers for dust production include traffic, livestock and wind erosion. During construction there are a range of additional drivers for dust production. The broader construction aspects that increase dust production risk are the creation of, upgrading and (in some areas) widening of roads, the construction of WTG pads and laydown areas and the construction of site facilities. These will all involve a range of construction activities include vegetation removal, trenching, blasting, grading, excavation, spoil stockpiles, concrete mixing and increased vehicle traffic.

2.2 Impacts of Dust production

Site disturbance is unavoidable during construction and with this comes dust production impacts. If left unmanaged, dust can degrade air quality and impact the health of staff, contractors, local residents, the public and environment. Dust is of particular concern in terms of its impacts on human health with fine dust particle sizes being of particular concern (SA Health 2018, SafeWork SA 2020, *Environment Protection (Air Quality) Policy 2016*). In addition to impacts on people, dust can also impact crops and livestock and natural ecosystems. Beyond these factors, the movement of dust from development sites has become a political issue in recent years, with developments in northern areas of South Australia receiving a lot of negative community and media attention (The Advertiser 2018, Lysaght et al. 2018).

3. REGULATORY REQUIREMENTS

3.1 Approval Conditions and Legislation

Dust management during the construction of the GWF Stage 1 is governed by regulatory requirements (Table 1) and commitments within Neoen's Development Application and the Decision Notification (DNF) Conditions for the GWF Stage 1 as issued by the South Australian Minister for Planning and Local Government and Planning, dated 3 March 2021.

Table 1: Legislation and standards used to inform the CEMP.

Element	Legislative and other requirements
Dust Management	DNF condition 9: Dust Management Plan *Environment Protection Act 1993 (EP Act) (SA)* *Environment Protection (Air Quality) Policy 2016 (SA)*
Traffic Management	DNF condition 30: Traffic Management Plan
Erosion Management	DNF condition 9: Soil Erosion and Drainage Management Plan *Environment Protection Act 1993 (EP Act) (SA)* *Environment Protection (Air Quality) Policy 2016 (SA)*
Rehabilitation	DNF condition 7: Staged rehabilitation following construction. DNF condition 9 and 12: Rehabilitation Management Plan

3.2 Environmental Management System

The dust management methods used for GWF Stage 1 will be implemented under GWF Environmental Management System (EMS). This system is defined in the CEMP and presented in Figure 3. This diagram demonstrates the position of the DMP as a Sub-plan in the EMS management structure.

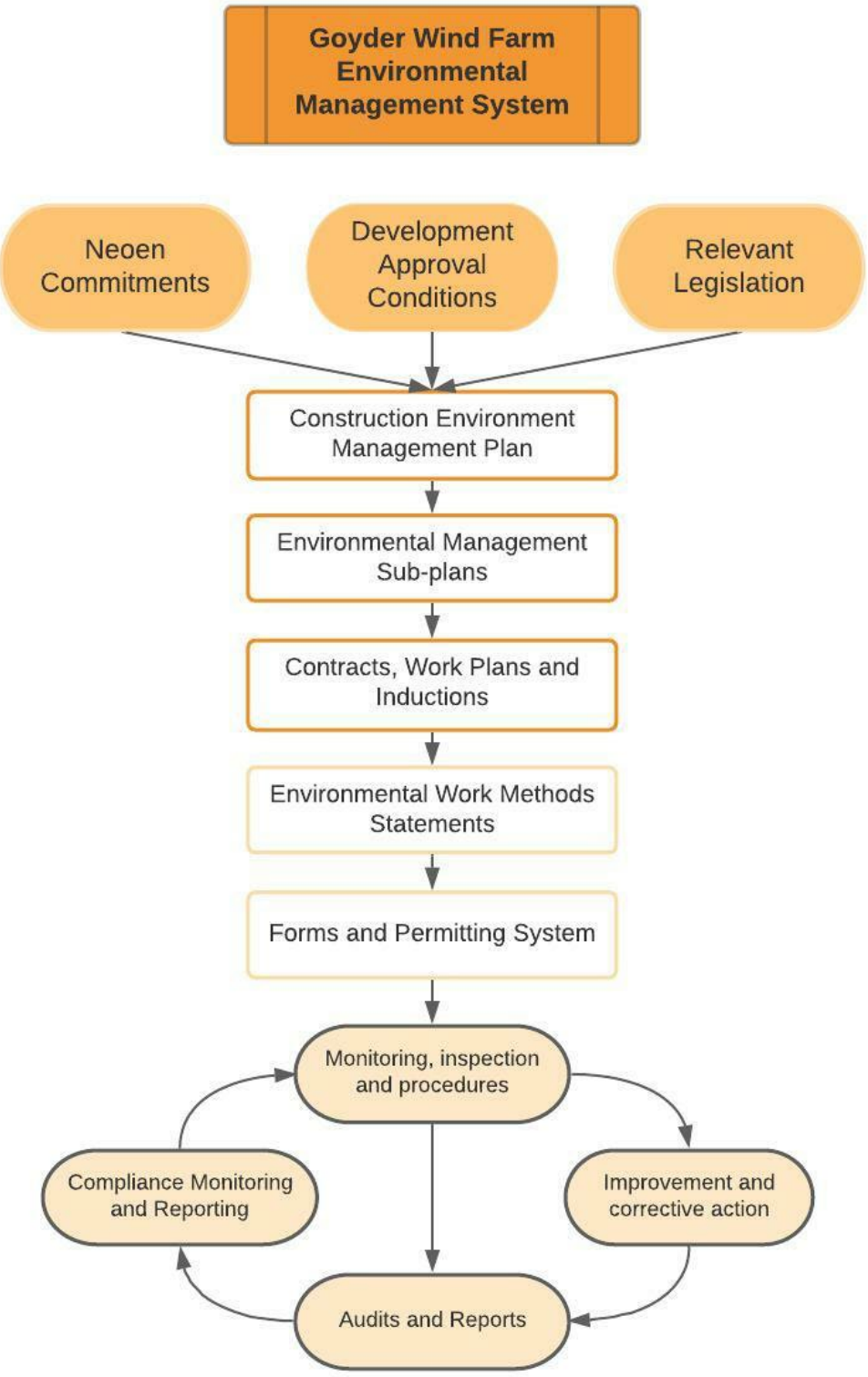

Figure 3: The Goyder Wind Farm Environmental Management System Structure

4. SITE DESCRIPTION

4.1 General

The GWF Stage 1 will be located between Burra and Robertstown in the Goyder Regional Council area (Figure 2). It is approximately 5.5km south of Burra, located between Barrier Highway and Worlds End Highway and covering an area of 7,610 hectares. The region is typical of the dry mid north, experiencing cool to cold winters and warm to hot summers. Its topography comprises undulating hills typical of the eastern Mount Lofty Ranges, with steep valleys occurring where watercourses cross the escarpments.

4.2 Site Stability

Soils of the eastern slopes of the Mount Lofty Ranges generally have a high to very high erosion potential and are likely to be subject to water and wind impacts, if the ground is disturbed. The Soil Erosion and Drainage Management Plan (SEDMP) has identified three main soil groups occurring on site (SEDMP Figure 2.1): Calcareous loams on rock (A), Loam over clay on rock (D), and Shallow soils on rock (L). Soil types D and L are the most broadly distributed on site. The erosive potential for the site has been assessed in the SEDMP as a moderate level of erosion risk. While the site and its soils are variable in terms of soil type, soil erosive potential, slope and disturbance level, the impacts of differing aspects of construction can be mitigated using varying grades of response based on a range of disturbance and climatic condition markers.

4.3 Native Vegetation

Much of the area was cleared of vegetation during the mining period and the land on which the project site is situated has been cropped and grazed since the late 1800s. Remnant native vegetation tends to exist in the steeper areas of the ranges and in patches along drainage lines. The areas that have not been cleared for agriculture represent a broad range of habitats with 14 vegetation associations identified in ecological surveys (EBS, 2020; Figure 4). The dominant native habitats are *Austrostipa sp*. (Spear Grass) mixed grassland, *Lomandra multiflora spp. dura* (Hard Mat-rush)/*Lomandra effusa* (Scented Mat-rush) mixed open grassland and *Eucalyptus porosa* open woodland. Ecological surveys have identified the presence of a range of threatened flora and fauna species on the site (EBS 2020).

4.4 Proximity of Local Residents to GWF Stage 1

Beyond the staff and contractors involved in the development who are at risk of dust impacts, local residents will also be subject to impacts if dust is not effectively controlled on site (Figure 5).

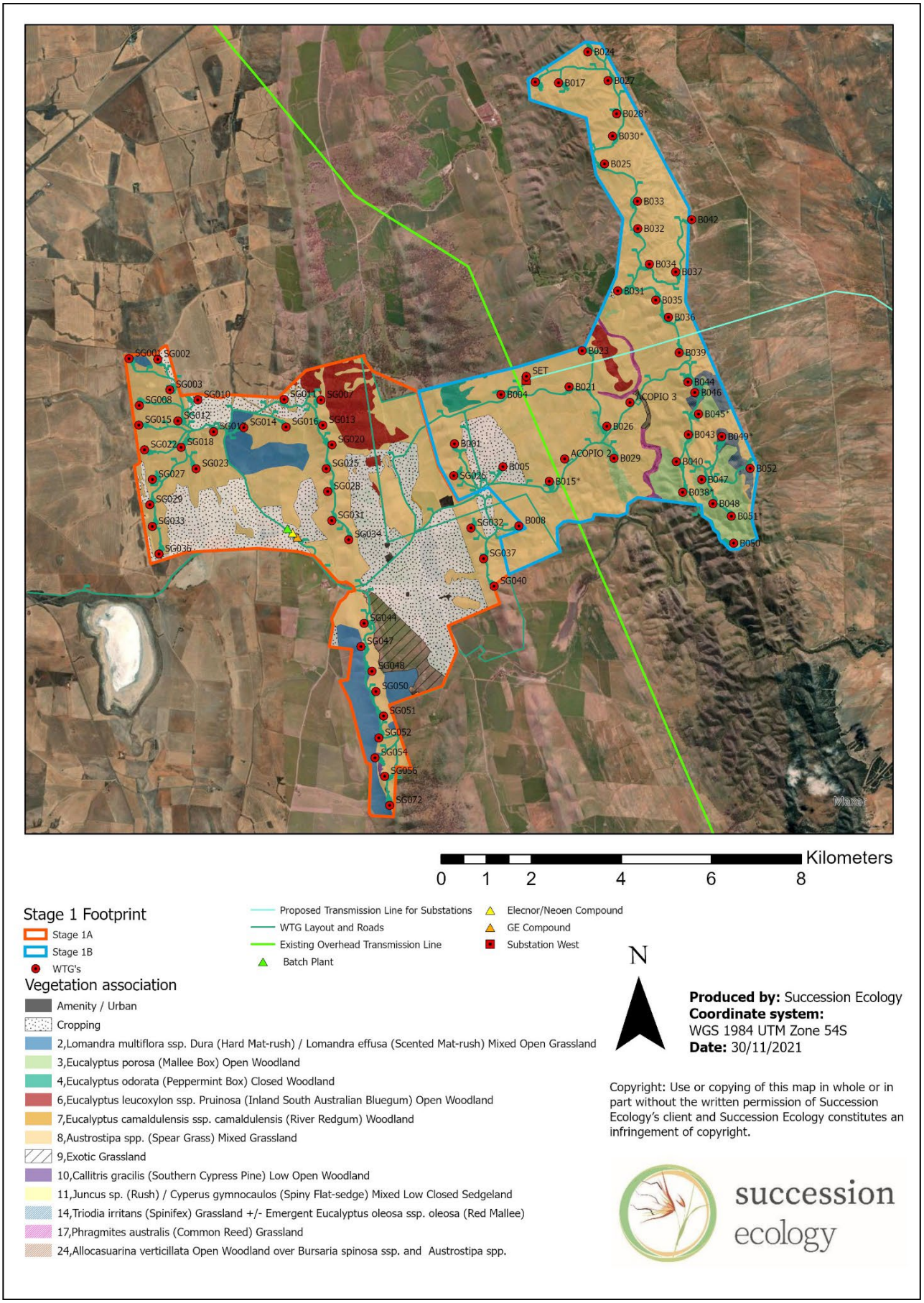

Figure 4: The vegetation communities identified in the area covered by GWF Stage 1.

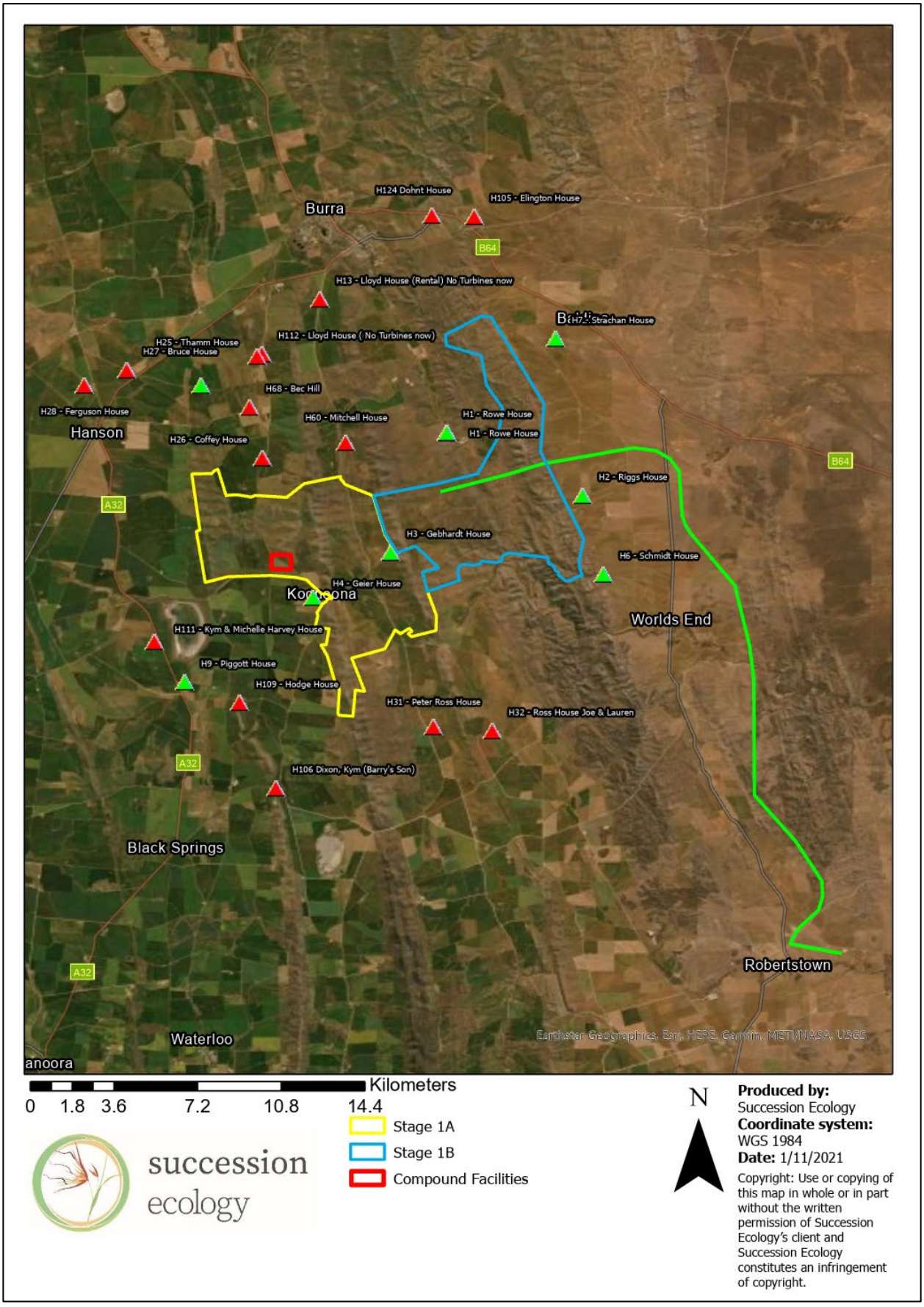

Figure 5: Locations of residential properties surrounding the GWF Stage 1 development. Green triangles are houses belonging to hosts and red are houses belonging to neighbours.

5. DUST MANAGEMENT

5.1 Dust Production

Dust will be produced on site through a range of processes, these will include:

1) Clearance of vegetation and the grading of soil surface to prepare roads, compounds and hard stands
2) Drilling and excavation for Geotech investigations and establishing WTG foundations
3) Blasting to prepare areas for construction
4) Stockpiling of soil
5) Driving on dirt roads

5.2 Dust Management

Dust Management will be conducted using the combination of an effective dust minimisation strategy, traffic management planning, site stabilisation techniques and rehabilitation. Beyond the dust management strategy described below, A series of sub-plans support the activities described in this Dust Management Plan (DMP) include the Rehabilitation Management Plan (RMP), Soil Erosion and Drainage Management Plan (SEDMP) and Traffic Management Plan (TMP). The broad management framework for reducing dust on site is to:

1) Minimise impacts through limiting vegetation removal and soil disturbance, monitoring site conditions to appropriately control dust production, educating contractors, restricting traffic to appropriately constructed roads, limiting traffic speeds and the effective implementation and enforcement of Environmental Work Method Statements (EWMS).
2) Site stabilisation to reduce dust movement through spraying with water trucks, the use of hydromulch and revegetation.
3) Monitoring and enforcing compliance using the processes set out in the CEMP.

Contaminated Soil

Geotechnical investigations have not highlighted any areas of contaminated soil on site. If an area is disturbed and unknown waste materials suggest that the soil could be contaminated, works on this site will cease. The site will be contained and stabilised using water spray. The appropriate authorities and experts will be engaged to remove or contain the contaminated material.

5.3 Minimising impacts

Limiting Impacts and Risk

Dust management will begin with a minimum disturbance approach taken to construction. Where possible, biomass reduction rather than grading should be applied. This will allow for natural regeneration of the seedbank on site. As this is not expected to be the primary site preparation approach, the seedbank resource in the topsoil should be preserved using scalping and stockpiling. This soil can be re-distributed across the disturbed areas to be revegetated at the end of construction. As a further method for minimising impacts the Flora and Fauna Management Plan (FFMP) recommends that contractor inductions, exclusion areas, EWMS and strict compliance measures will ensure that construction does not extend beyond the proposed development footprint.

Traffic protocols are in place as per the CEMP and TMP; stating that travelling speed on the construction site is 40km/hr and 15km/hr in the site compound, which will minimise the physical wear of unsealed roads by traffic and dust production. However, heavy vehicles will likely degrade roads as construction progresses, which will require methods to stabilise tracks and control dust movement.

Beyond the clearing of soil, aggregate base will be imported. This comes from an accredited quarry and will be pre-wet to ensure that dust particle production is not an issue and to ensure the maximum compaction and stability during bench construction.

Monitoring

Site conditions will be monitored using the variables in Tables 2 and 3. This metric will be used to assess dust production risk and determine the appropriate timing for construction activities to reduce dust production e.g., activities such as soil and earth movement, should not be undertaken in particularly dry and windy conditions. Monitoring will also be used to enforcing compliance using the processes set out in the CEMP.

Table 2: Dust risk assessment matrix (TARP). Rainfall and wind data to be collected from BOM and onsite Met masts.

Contributing Factor		**Measurement Units**					
Predicted Rainfall	Value	>20mm/day	10-20mm per day	1-10mm/day	<1mm	0mm/day	Score
	Score	0	0	1	1	2	
Rainfall in past 2 days	Value	>10 mm	5-10mm	1-5mm	<1mm	0mm	
	Score	0	1	1	1	2	
Wind Speed (km/hr)	Value	<5	5-20	20-40	40-60	>60	
	Score	0	1	2	3	4	
						TOTAL	

Table 3: Dust management action steps.

Score Values	**Less than 2 Low risk**	**2-4 Moderate Risk**	**5-7 High risk**	**8 and above Extreme risk**
Management Action	Standard (minimum) controls in place.	1) Standard (minimum) controls in place. 2) Monitor on site wind speed and direction.	1) Standard (minimum) controls in place. 2) Monitor on site wind speed and direction. 3) Reduce or postpone vegetation clearance work if required.	1) Standard (minimum) controls in place. 2) Monitor on site wind speed and direction. 3) STOP WORK Postpone vegetation clearance work.

Monitoring of the dust levels at the compound and laydown areas will be undertaken to determine the dust levels being produced. A background assessment of air quality will be used as a baseline to determine the impact of construction works above the baseline. Monitoring activities will include daily visual inspections, assessment with a handheld air quality meter and assessment against the risk matrix using data collected from the BOM website and on-site Met masts.

5.4 Stabilisation Methods

A range of site stabilisation methods will be applied are available if required for stabilisation during the construction of GWF Stage 1. These all have limitations in their capacity to contribute to site stabilisation and therefore no single method will provide a complete solution. The proposed methods are presented in Table 2 with a brief description of application and limitations. The aim with all of these methods (aside from water) is to use them in combination with revegetation such that the vegetation can provide a long-term, sustainable mechanism for stabilising the soil and reduce dust production. Water will be used as the primary stabilisation method for roads and construction areas, particularly during wind events, before other stabilisation methods have been implemented.

Table 4: Site stabilisation methods, their uses, and limitations.

Method	Description	Limitation	Application
Water	This is the most simple and practical method for managing dust-based site stability issues. It is applied simply with a water truck and can be applied simply as required with monitoring used as a trigger for management on high wind days.	In extreme conditions it may not be practical to address all dust issues with this method.	Water trucks will be maintained on site permanently over the construction program. Their use will be determined based on the activities being carried out and the outcomes of the site condition assessment. If conditions move to a higher risk level, additional water trucks will be sourced from contracting companies.
Pre-Conditioning of Road Materials	This method adds moisture to road materials to improve compaction and stability	This method is sound and well tested with the only limitations being extreme heat drying the substrate before compaction.	A range of methods are used including water truck, watering systems and Pug Mill.
Silt fencing	This is a capture-based method of control that is placed in a linear arrangement along the boundary of a disturbed site to prevent movement of soil, rubble or silt from a site via water and wind erosion.	This method has limitations in terms of the weight of material that it can hold and the extent of dust reduction that it can contribute. This method will not prevent erosion of the disturbed area, rather it will capture dirt that is moved.	This will be used when minor slopes at grades of 2:1 (D:H) where rubble waste is small material and risk of siltation to swales or contamination of protected areas is of concern.
Hydro-Mulching	This is a surface protection method that is spread across a disturbed site, providing a barrier to wind and water erosion. A hydro-mulch will sit on top of a soil surface like a skin.	This method is limited in effect based on particle size, working for small rubble and soil. It is worth noting that water will flow over this surface rather than being rapidly absorbed, increasing the erosion potential on untreated areas.	This method will be used on steep batters, for example, 1:2 (D:H), where soil slopes are thought to require support for stabilisation.
Dust Suppressant	This is a surface protection method that is distributed across a disturbed site, providing a barrier to wind and water erosion. A suppressant will soak into the soil and bind particles together.	This method is limited in effect based on particle size, working on soil rather than rubble. It is worth noting that water will flow over this surface rather than being rapidly absorbed, increasing the erosion potential on untreated areas.	This method will be used on roads and flat surfaces where soil or aggregate surfaces are not developing a stable crust with just the addition of water.
Geo-Textile	This is a surface protection method that should be kept as an option for the most severe water-based erosion issues as its application is very expensive. It will slow water flow to an extent but will, when water-logged, increase flow rates.	It has the potential to be undermined, in particular setting, allowing continued water erosion.	This method is considered a last resort where other stabilisation techniques are not providing sufficient support to prevent dust movement.

6. IMPLEMENTATION

6.1 Actions required

Effective dust management outcomes will use a combination of stabilisation and revegetation. Stabilisation should be available on site to suit climatic conditions and applied to the site as quickly as possible following disturbance. The stabilisation method to be used will be driven by the risk of dust production, extent of disturbance, the risk of soil movement and the proximity of areas with threatened species (see FFMP). This will need to be assessed on a case-by-case basis.

6.2 Air Quality Targets

Dust management will be guided by the air quality targets described in the *EP Act 1993 (SA)* and *EP (Air Quality) Policy 2016*. The EP Act 1993 states the principle of a "general environmental duty".

> Part 4—General environmental duty
> 25—General environmental duty
>
> *(1) A person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm.*

With this in mind, an air quality monitoring program will be established as per section 5.2 to ensure that the particles PM2.5 and PM10 at required levels and monitor Total Suspended Particulate (TSP) matter. In addition, wind speeds for the site will be monitored as part of the daily site inspection as described below. If wind speeds reach 40km or more, in a direction that will impact workers or surrounding residential properties, water carts must be available to prevent dust pollution.

6.3 Monitoring

Monitoring of dust production will be used to identify any issues that may require further management. This will be included in the daily inspections (wind speed and visual dust), static monitors at the compound and laydown areas, feedback from site supervisors during shifts and quarterly site audits (CEMP). All monitoring will be conducted using the metric presented in Table 3. The data collected during the monitoring process will also provide evidence on the achievement of objectives of this DMP, and the project's Development Approval Conditions. Where monitoring detects a management issue that requires action, this will be reported to the Environment Manager or Construction Manager. Changes to management or specific actions will be implemented based on the mitigation measures presented in Table 3. If the management issue is complex, expert advice will be sought on alternative establishment measures. All reporting will be included within the framework established in the CEMP.

Table 5: Monitoring criteria

Measure	Measured using	Target Metric	Person Responsible
Stabilisation			
Wind Speed and Direction	• Observation	Water carts will be used where clearance is occurring. When wind speeds exceed 40km/hr the frequency of watering on site will be increased as required.	Environmental Manager/HSE Consultants
Dust Movement	• Observation (Images taken daily)	Extensive visible dust not evident and does not exceed expected levels.	
Dust Movement	• Hand Held Air quality meter	Particles PM2.5 and PM10 do not exceed concentrations of 0.05 mg/m^3 and 0.025 mg/m^3 respectively.	

* See Environment Protection (Air Quality) Policy 2016.

6.4 Responsibilities

Responsibilities specific to LRP are detailed in Table 4.

Table 6: Personnel with specific Landscaping and Revegetation Plan responsibilities

Role	Responsibility
Project Manager	Provides the required resources to facilitate the DMP Responsible for compliance with all applicable environmental legislation and contract obligations.
Construction Manager	Ensures the objectives of the DMP are achieved. Ensures requirements of the DMP are communicated and implemented. Ensures appropriate contractors are engaged Ensures appropriate training is delivered. Ensures communication and reporting framework is in place. Reports incidents to Project Manager, Neoen representative and to agencies as required. Ensures the timely delivery of corrective actions and monitoring of outcomes. Responsible for compliance with all applicable environmental legislation and contract obligations. Reviews the DMP.
Environmental Manager	The principal point of advice in relation to the environmental performance. Oversees engagement of contractors, purchase of materials and ordering of seed. Oversees implementation of DMP activities Oversee the implementation of all DMP monitoring and reporting. Provide support and advice regarding applicable environmental legislation and contract obligations. Ensure environmental auditing is undertaken in accordance with all relevant CEMP and DMP requirements.
Contractors and their staff	Ensure goals of DMP are implemented upon instruction. Identify and proactively report incidents. Receive training.

6.5 Implementation process

The CEMP defines a series of management tools, training and induction processes, meetings and communication activities and monitoring, inspection, auditing, reporting processes and complaints procedure that will include dust management. For example:

1) Monitoring will be used to drive decisions on the frequency of watering needed.
2) Morning toolbox meetings (daily) will be used to inform staff and contractors of the dust risk on site.
3) A combination of daily inspections and supervisor observations (through the hazard card system) will be used to identify dust that is not being effectively managed.
4) Management Meetings will be used to determine if strategies beyond the use of water trucks are required (as per Table 4).

5) A complaints procedure for any dust production concerns is documented in the CEMP Section 6.9.

6.6 Subcontractor Management

Subcontractors are required to utilise the DMP to build Environmental Work Method Statements (EWMS) specific to their activities. These EWMS is to be supplied to the GLC prior to works being undertaken. GLC will be responsible for verifying whether the sub-contractors' documents are consistent with the DMP and adequately address the environmental risks of the activity. Formal advice in this respect will be provided to the sub-contractor before works can commence.

7. REFERENCES

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