Hunterston Construction Yard
Construction Dust Assessment

February 2024

CONTROL SHEET

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1 INTRODUCTION

1.1 Scope of Report

EnviroCentre has been appointed by Arch Henderson on behalf of Clydeport Operations Ltd., to undertake a Construction Dust Assessment to assess the impacts of dust emissions to air during the upgrade of the existing into Hunterston Construction Yard into harbour facility with the large working platform for renewable industries, south of Fairlie in North Ayrshire.

Emissions of dust to air can occur on construction sites, causing annoyance through dust soiling; ecosystem and biodiversity effects; and human health effects due to increased particulate matter.

The construction dust assessment is required to determine the scale and magnitude of the development activities; the sensitivity of the surrounding area; the risk of dust impacts occurring and site-specific mitigation measures. The appropriate site-specific mitigations measures are then outlined in the accompanying Construction Dust Management Plan (CDMP) (EnviroCentre Doc Ref: 13911).

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1.3 Guidance

The dust assessment has been undertaken in accordance with Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024; Version 2.2). This guidance document has been produced by the Institute of Air Quality Management (IAQM) using the experience of IAQM members within a working group. This guidance document considers relevant literature and updates in the 2012, 2014, 2016, 2023 and 2024 IAQM publications.

1.4 Construction Dust Impacts

Dust emissions can occur during development of a site through demolition of existing structures, land clearance, earthworks, and vehicle / plant movements (both within the site and at points of access). The degree and extent of emissions are influenced by weather conditions as well as the type and level of construction activity occurring at any particular time.

If not carefully managed, dust emissions from a site can cause annoyance through soiling of properties, vehicles etc. and affect the biodiversity of ecosystems. Additionally, dust, in particular Particulate Matter less than 10 micrometres in diameter (PM_{10}), is known to be associated with a range of health effects. Larger scale development sites can, if not carefully managed, increase the number of days when PM_{10} concentrations exceed the daily air quality objective limit of 50 $\mu g/m^3$ as well as increase the long-term PM_{10} concentrations.

Dust can affect vegetation both physically and chemically. Impacts include reduced photosynthesis, respiration and transpiration through smothering, loss of plants or animals through changes in acidity of soils or watercourses, increased susceptibility to stresses such as pathogens and air pollution. In general, once construction activities have stopped these impacts will normally be reversed.

2 ASSESSMENT METHODOLOGY

A framework for the assessment of demolition and construction dust is provided in the IAQM (2024) guidance document and is summarised in Figure 2-1 below.

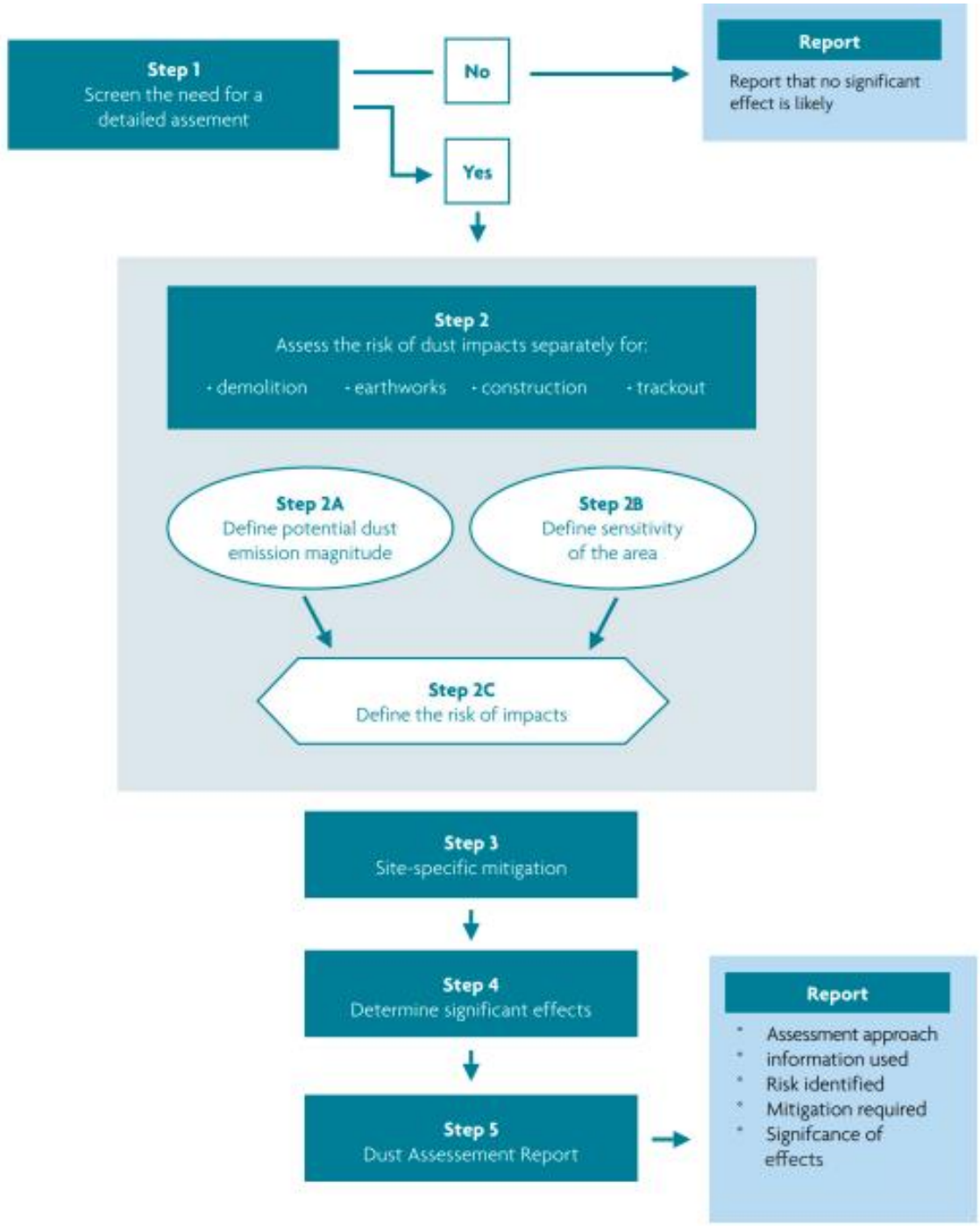

Figure 2-1: Summary of Dust Assessment Framework (from Figure 1 within IAQM (2024) guidance).

2.1 Step 1: Screen the Need for a Detailed Assessment

A detailed dust assessment will normally be required where there is:

- A 'human receptor' within;
  - 250m of the boundary of the site; or
  - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).
- An 'ecological receptor' within;
  - 50m of the boundary of the site; or
  - 50m of the routes(s) used construction vehicles on the public highway up to 250m from the site entrance(s).

The criteria are noted to be conservative in nature. If none of the criteria above is met, then it can be concluded that the level of risk associated with construction dust is "negligible" and any effects will not be significant. As such there is no requirement for a detailed dust assessment.

2.2 Step 2 Assess the Risk of Dust Impacts

2.2.1 Define the Potential Dust Emission Magnitude

The dust emission magnitude is defined by the scale of the proposed construction works and is categorised as small, medium or large. Example criteria provided in the IAQM (2024) document are provided in Table 2-1 below:

Table 2-1: Criteria for Dust Emission Magnitude

Work	Dust Emission Magnitude		
	Large	**Medium**	**Small**
Demolition	Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level.	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level.	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.
Earthworks	Total site area >110,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height.	Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3 m – 6 m in height.	Total site area <18,000 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height.

Work	Dust Emission Magnitude		
	Large	**Medium**	**Small**
Construction	Total building volume >75, 000 m^3, on site concrete batching, sandblasting.	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching.	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
Trackout	>50 HDV (>3.5 t) outward movements[1] in any one day[2], potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.	20-50 HDV (>3.5 t) outward movements[1] in any one day[2], moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m.	<20 HDV (>3.5 t) outward movements in any one day[2], surface material with low potential for dust release, unpaved road length <50 m.

2.2.2 Define the Sensitivity of the Area

The sensitivity of the area includes a number of factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- The local background concentrations of PM_{10}; and
- Site specific factors, such as the presence of natural shelters, trees etc.

For each of the development activities i.e. demolition, construction, earthworks and trackout, the sensitivity of the area requires to be defined for dust soiling, health effects and ecological effects. Only the highest level of area sensitivity should be considered in the assessment. Guidance for defining the sensitivity of receptors to each of these potential impacts is provided below.

Note: For assessing trackout, the distance should be measured from the side of the roads used by construction traffic. Without site specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Dust Soiling

IAQM (2024) requires professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the general principles provided in Table 2-2.

[1] A vehicle movement is a one-way journey. i.e. from A to B and excludes the return journey.

[2] HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

Table 2-2: Dust Soiling Sensitivity Definitions

Sensitivity	Definition
High	• Users can reasonably expect[a] an enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected [a] to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; or • Indicative examples include dwellings, museums, and other culturally important collections, medium- and long-term car parks[b] and car showrooms.
Medium	• Users would expect[a] to enjoy a reasonable level of amenity, but would not reasonably expect[a] to enjoy the same level of amenity as in their home; or • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected[a] to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work.
Low	• The enjoyment of amenity would not reasonably be expected[a]; or • Property would not reasonably be expected[a] to be diminished in appearance, aesthetics or value by soiling; or • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural) footpaths, short-term car parks[b] and roads.

[a] People's expectations will vary depending on the existing dust deposition in the area
[b] Car parks can have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with work place or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.

The sensitivity of the area to soiling is then defined using the criteria in Table 2-3.

Table 2-3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)[a]			
		<20	<50	<100	<350
High	>100	High	High	Low	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

[a] Estimate the total number of receptors within the stated distance. Only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitive receptors <20 m of the source and 95 high sensitive receptors between 20 and 50 m, then the total number of receptors < 50 m is 102. The sensitivity of the area in this case would be high.

Heath Effects of PM_{10}

The sensitivity of health in relation to PM_{10} concentrations depends on how likely the receptor will be exposed to elevated concentrations over a 24-hour period. This is consistent with DEFRA's advice for local air quality management (DEFRA, 2022). The principals to define sensitivity are provided in Table 2-4.

Table 2-4: Health Effects Sensitivity Criteria

Sensitivity	Definition
High	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).[a] • Indicative examples include residential properties, hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of the assessment.
Medium	• Locations where the people exposed are workers[b], and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10} as protection is covered by Health and Safety at Work legislation.
Low	• Locations where human exposure is transient[c]. • Indicative examples include public footpaths, playing fields, parks and shopping streets.

[a] This follows Defra guidance as set out in LAQM.TG(22) (DEFRA, 2022).

[b] Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM_{10}. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category.

[c] There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.

The sensitivity of the area to health impacts is then defined using the criteria in Table 2-5.

Table 2-5: Sensitivity of the Area to Human Health Impacts Assessment Criteria

Receptor Sensitivity	Annual Mean PM_{10} concentration[b]	Number of Receptors[c]	Distance from the Source (m)[a]				
			<20	<50	<100	<200	<350
High	>32 µg/m³(>18 µg/m³ in Scotland)	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m³ (16-18 µg/m³ in Scotland)	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m³ (14-16 µg/m³ in Scotland)	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m³ (<14 µg/m³ in Scotland)	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m³ (>18 µg/m³ in Scotland)	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m³ (16-18 µg/m³ in Scotland)	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m³ (14-16 µg/m³ in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low

	<24 µg/m^3 (<14 µg/m^3 in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

[a] Estimate the total within the stated distance, noting that only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors <20 m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors <50 m is 102. If the annual mean PM_{10} concentration is 29 µg/m^3, the sensitivity of the area would be high.
[b] Most straightforwardly taken from the national background maps, but should also take account of local sources. The values are based on 32 µg/m^3 being the annual mean concentration at which an exceedance of the 24-hour objective is likely in England, Wales and Northern Ireland. In Scotland there is an annual mean objective of 18 µg/m^3
[c] In the case of high sensitive receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties.
[d] For trackout, the distances should be measured from the side of the roads used by construction traffic. the impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50m from the edge of the road.

Ecological Effects

Dust impacts may cause physical effects or chemical effects on ecological receptors (IAQM, 2024). Examples of physical effects include a reduction in plant metabolic processes such as photosynthesis and respiration. Examples of chemical effects on vegetation as a result of dust impacts include changes to soils or the water environment that may cause a reduction in plants or animals.

IAQM (2024) guidance document requires professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the general principles provided in Table 2-6.

Table 2-6: Ecological Impacts Sensitivity Definitions

Sensitivity	Definition
High	• Locations with an international or national designation and the designated features may be affected by dust soiling; or • Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain[b]. • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or • Locations with a national designation where the features may be affected by dust deposition. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	• Locations with a local designation where the features may be affected by dust deposition. • Indicative example is a local Nature Reserve with dust sensitive features.

[a] A Habitat Regulation Assessment of the site may be required as part of the planning process, if the site lies close to an internationally designated site i.e. Special Conservation Areas (SACs), Special Protection Areas (SPAs) designated under the Habitats Directive (92/43/EEC) and RAMSAR sites.

[b] Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

The sensitivity of the area to Ecological Impacts is then defined using the criteria in Table 2-7. Only the highest level of area sensitivity from the table needs to be considered.

Table 2-7: Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

2.2.3 Define the Risk of Impacts

Once the magnitude and sensitivity of the area for each of the construction activities has been defined then the risk of impact can be determined using the criteria in Tables 2-8 to 2-11 as appropriate. The risk of impacts is assessed with no mitigation measures in place.

Table 2-8: Risk of Dust Impacts – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 2-9: Risk of Dust Impacts – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 2-10: Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 2-11: Risk of Dust Impacts - Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

2.3 Step 3: Define Appropriate Site-Specific Mitigation Measures

Site specific mitigation measures are defined for each of the construction activities considered in the assessment based on the assessment outcomes. Where the risk is assigned as negligible then no specific mitigation measures beyond those required by legislation or as good practice will be required.

2.4 Step 4: Determine Significant Effects

The significance of effects is determined once the risk and appropriate site-specific mitigation measures have been defined.

3 SITE DESCRIPTION & BACKGROUND INFORMATION

3.1 Site Location & Development Description

The proposed development consists of upgrade of the existing Hunterston Construction Yard into harbour facility with the large working platform for renewable industries, south of Fairlie in North Ayrshire.

The site extends out into the Firth of Clyde with Hunterston Power Stations ~1km to the south; Fairlie village ~1.9km to the northeast; the island of Great Cumbrae ~1.4 km to the northwest; and the redundant Hunterston Coal Terminal ~500m to the east. See Drawing No. 176482-GIS001, Appendix A for the site's location. The site is centred at Grid reference 218793 , 652942.

The site is an area of relatively flat reclaimed land, approximately 40 Ha (400,000 m^2) in size (800 m x 500 m at its widest point). The site is accessible via Oilrig Road / Power Station Road from the A78 at the Hunterston Roundabout.

3.2 Sensitive Receptors

Table 3-1 and Table 3-2 below provides details of the Sensitive Receptors (both human (SR) located outwith 350 m and ecological (ESR) located within 50 m of the site boundary. Sensitive Receptors located 50 m of the routes used by construction vehicles up to 500m from site trackout). See Section 4.1 for more details.

See Drawing No. 176482-GIS002 Appendix A for SR & ESR locations. The number of receptors within each sensitive receptor area is estimated in line with IAQM (2024) guidance. The approximate number of residential and commercial properties indicated by SR is given in Table 3-1.

Table 3-1: Summary of Sensitive Receptor Areas

SR ID	SR Description	Approximate Number of Receptors		Orientation from Site	Minimum Distance from Site Boundary (m)	Minimum Distance from Construction Vehicle routes (m)
		Earthworks, Construction & Demolition	Trackout			
SR01	Residential	1-10	N/A	South	>350	N/A
SR02	Commercial	10-100	N/A	South	>350	N/A
SR03	Residential	1-10	N/A	South	>350	N/A
SR04	Commercial	10-100	N/A	South	>350	N/A
SR05	Commercial	10-100	N/A	Northeast	>350	N/A
SR06	Residential	1-10	1-10	East	>350	<50

Ecological sensitive receptors are their distance/orientation to the proposed development site are outlined in Table 3-2.

A search of the online NatureScot online 'Sitelink' database found that there are 2 designated ecological receptors are present on site (NatureScot, 2024).

Table 3-2: Summary of Ecological Sensitive Receptor Areas

SR ID	SR Description	Designation (Description)	Orientation from Site	Minimum Distance from Site Boundary (m)*	Minimum Distance from Construction Vehicle routes (m)
ESR1	Southannan Sands	SSSI (Sandflats – Marine Protection (including for marine mammals)	West	0	N/A
ESR2	Southannan Sands	SSSI (Sandflats – Marine Protection (including for marine mammals)	East	0	N/A

* Where 0 m is noted, the site is bound by the designated area.

3.3 Background Air Quality

Under Part IV of the Environment Act 1995, all Local Authorities are required to review and assess air quality in their region and have a duty to declare an Air Quality Management Area (AQMA) where an air quality objective has been or is likely to be exceeded. North Ayrshire Council does not currently have any AQMAs withing their boundary; outlining this area is not within an area of material concern for air quality.

In order to characterise pollutant concentrations at this site, the background concentrations of PM_{10} were obtained from background maps which are available from the Air Quality in Scotland website for a base year of 2018 and for all other years up to 2030. These maps are divided into Ordnance Survey (OS) 1 kilometre grid squares.

The OS 1 kilometre grid square the site is located in is 218500, 652500. The 2022 background PM_{10} concentration was 6.55 µg/m^3 which is noted to be well below the air quality objective of 18 µg/m^3, for this parameter.

4 DUST ASSESSMENT

4.1 Step 1: Screening the Need for a Detailed Assessment

The need for detailed assessment was based on the criteria detailed in Section 2.1 of this report.

The site is considered to require a detailed assessment since 'Human Receptors' are present within 50 m of the haul route used by construction vehicles up to 500 m from the site entrance and 'Ecological Sensitive Receptors' are present within 50 m of the site boundary.

Due to the site's rural location, there are no 'Human Receptors' within 350 m of the site boundary, however, for conservatism purposes, 'Human Receptors' at greater distances have been included.

Demolition

There will be some demolition proposed to be undertaken as part of the site redevelopment principally related to the base of the existing dry dock. An expected volume of demolished material associated is approx. 13,000 m^3.

Earthworks and Construction

Sensitive receptors ESR1 and ESR2 were identified as falling inside 50 m of the site boundary and shall be assessed for earthworks and construction activities. SR01-SR06 were identified as falling outside 350 m of the site boundary (see 176482-GIS002, Appendix A), however for conservatism purposes these human receptors shall be assessed for demolition, earthworks and construction activities.

Trackout

For trackout activities, Sensitive Receptor SR06 was identified within 50 m of the routes to be used by construction vehicles (See Drawing 176482-GIS002, Appendix A).

4.2 Step 2: Assess the Risk of Dust Impacts

4.2.1 Define the Potential Dust Emission Magnitude

The dust emission magnitude for each activity was determined using the criteria detailed in Section 2.2 of this report. Table 4-1: Dust Emission Magnitude. Table 4-1 below summarises the dust emission magnitude for the site.

Table 4-1: Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Medium
Earthworks	Large
Construction	Large
Trackout	Medium

The dust emission magnitude for earthworks was determined to be '**Medium**'. The primary demolition works are related to removal of the concrete base in the dry dock with an expected volume of demolished material associated is approx. 13,000 m^3. This gives this site a demolition dust emissions magnitude of 'Medium', as per IAQM criteria (IAQM, 2024).

The dust emission magnitude for earthworks was determined to be **'Large'**. The total site area at approximately 400,000 m^2 which is >110,000m^2 as given as an indicative measure of a 'large' site as per IAQM criteria (IAQM, 2024).

The dust emission magnitude for construction was determined to be **'Large'.** The total construction building volume is not yet determined at this early stage. However, due to the nature of the development, it is estimated the construction volume will likely exceed the given 'Large' criteria (> 75,000 m^3 (IAQM, 2024).

The dust emission magnitude for trackout was determined to be **'Medium'**. The total number of HGV movements is not yet determined at this early stage. However, it is anticipated there will be an average of 10 HGV movements per day. There is an existing site road (Power Station Rd and Oilrig Rd) which will be utilised by site traffic as a haulage route, and therefore unpaved roads are not likely to be present near site exit. This gives this site a trackout dust emissions magnitude of 'Medium', as per IAQM criteria (IAQM, 2024).

4.2.2 Define the Sensitivity of the Area: Human Sensitive Receptors

The sensitivity of the area to the effects of dust soiling and health effects was determined using the criteria set out in Section 2.2.2 of this report.

Human Sensitive Receptors

This section defines the sensitivity of the identified 'Human Receptors' to dust soiling and health effects.

a) <u>Receptor Sensitivity</u>

The criteria detailed in Table 2-2 and Table 2-4 of this report were used to determine receptor sensitivity to the effects of dust soiling & health impacts. Receptor sensitivity to dust soiling and health effects has been considered for receptors SR01-SR06.

Table 4-2 summarises the sensitivity of each receptor for dust soiling and PM_{10} effects.

Table 4-2: Receptor Sensitivity

Sensitive Receptor ID	Receptor Sensitivity to Dust Soiling Effects	Receptor Sensitivity to PM_{10} Effects
SR01	High	High
SR02	Medium	Medium
SR03	High	High
SR04	Medium	Medium
SR05	Medium	Medium
SR06	High	High

Dust Soiling Effects

- Receptor SR01, SR03, and SR06 were determined to have a **High** sensitivity to dust soiling as residential receptors based on the criteria given in Table 2-2.
- Receptors SR02, SR04, and SR05 were determined to have a **Medium** sensitivity to dust soiling as residential receptors based on the criteria given in Table 2-2.

PM_{10} Health Effects

- Receptor SR01, SR03, and SR06 were determined to have a **High** sensitivity to dust soiling as receptors based on the criteria given in Table 2-4.
- Receptors SR02, SR04, and SR05 were determined to have **Medium** sensitivity to PM_{10} based on the criteria given in Table 2-4.

b) Sensitivity of the Area

The sensitivity of the area to dust soiling and human health effects was determined for earthworks, construction and trackout activity using the criteria set out Section 2.2.2 and considers the receptor information from Table 3-1 and receptor sensitivity as detailed in Table 4-2.

The assessment results for dust soiling effects are detailed in Table 4-3 below.

Table 4-3: Sensitivity of the Area to Dust Soiling Effects

SR ID	Sensitivity of Receptor	Approximate No. of Earthworks & Construction Receptors	Approximate No. of Trackout Receptors	Distance from Source (m)		Sensitivity of Area to Dust Soiling Effects	
				Demolition, Earthworks & Construction	Trackout	Demolition, Earthworks & Construction	Trackout
SR01	Residential	1-10	N/A	>350	N/A	Low	N/A
SR02	Commercial	10-100	N/A	>350	N/A	Low	N/A
SR03	Residential	1-10	N/A	>350	N/A	Low	N/A
SR04	Commercial	10-100	N/A	>350	N/A	Low	N/A
SR05	Commercial	10-100	N/A	>350	N/A	Low	N/A
SR06	Residential	1-10	1-10	>350	<50	Low	Low

The sensitivity is determined as **'Low'** for Demolition, Earthworks, Construction, and for Trackout.

Using the background PM_{10} concentration for 2022 of 6.55 µg/m^3 (see Section 3.3), the assessment results for sensitivity to PM_{10} impacts on human health are given in Table 4-4 below.

Table 4-4: Sensitivity of Area to PM_{10} Impacts on Human Health

SR ID	Sensitivity of Receptor	Approximate No. of Earthworks & Construction Receptors	Approximate No. of Trackout Receptors	Distance from Source (m)		Sensitivity of Area to Dust Soiling Effects	
				Demolition, Earthworks & Construction	Trackout	Demolition, Earthworks & Construction	Trackout
SR01	Residential	1-10	N/A	>350	N/A	Low	N/A
SR02	Commercial	10-100	N/A	>350	N/A	Low	N/A
SR03	Residential	1-10	N/A	>350	N/A	Low	N/A
SR04	Commercial	10-100	N/A	>350	N/A	Low	N/A
SR05	Commercial	10-100	N/A	>350	N/A	Low	N/A
SR06	Residential	1-10	1-10	>350	<50	Low	Low

The results show that the sensitivity of the area to PM_{10} effects is **'Low'** for Demolition, Earthworks, Construction and Trackout. Therefore, the overall sensitivity of the area to PM_{10} impacts on human health is considered to be 'Low'.

Summary of Sensitivity of Surrounding Area

Table 4-5 below summarises the sensitivity of the surrounding area to demolition, earthworks, construction and trackout activities.

Table 4-5: Summary of Sensitivity of the Surrounding Area

Activity	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	Low
Human Health	Low	Low	Low	Low

4.2.3 Define the Sensitivity of the Area: Ecological Receptors

The ecological sensitivity of the area to dust soiling effects was determined for demolition, earthworks, construction and trackout activity using the criteria set out in Table 2-6 and considers the receptor information from Table 3-2 and receptor sensitivity as detailed in Table 4-6.

The development site has SSSI Southannan sandflats within the development area. The west has been assigned to ESR01 Southannan sandflats and the east has been assigned to ESR02 Southannan sandflats. See Table 3-2 for further details.

Ecological Sensitive Receptors

This section defines the sensitivity of the identified Ecological Receptors to dust soiling.

a) <u>Receptor Sensitivity</u>

The criteria detailed in Table 2-6 was used to determine receptor sensitivity to the effects of dust soiling. Receptor sensitivity to dust soiling and health effects has been considered for receptors ESR1

and ESR2. Ecological receptors ESR1 and ESR2 sensitivity to dust soiling that will affect vascular function has been considered.

Table 4-6 summarises the sensitivity of each receptor for dust soiling.

Table 4-6: Receptor Sensitivity (Ecological Receptor)

Sensitive Receptor ID	Receptor Sensitivity to Dust Soiling Effects
ESR1	Medium
ESR2	Medium

Dust Soiling Effects Ecological Receptors

ESR1 – ESR2 were determined to have a **'Medium'** ecological sensitivity as they are designated as a SSSI. Both areas of this SSSI are situated within 20 m of the site boundary (east and west) and are therefore possibly at risk of dust soiling impacts to area biodiversity.

Measures to protect and mitigate any potential damage to this SSSI are detailed in the Mitigation Measures section of this report and accompanying Construction Dust Management Plan (EnviroCentre Document No: 13911).

b) Sensitivity of Area

The sensitivity of the area to dust soiling was determined for demolition, earthworks, construction and trackout activity using the criteria set out Section 2.2.2, and considers the receptor information from Table 2-6 and receptor sensitivity as detailed in Table 2-7.

The assessment results for dust soiling effects are detailed in Table 4-7 below.

Table 4-7: Sensitivity of Sandflat (Ecological Receptor) to Dust Soiling

SR ID	Sensitivity of Receptor	Distance from Source (m)		Sensitivity of Area to PM_{10} Effects	
		Demolition, Earthworks & Construction	Trackout	Demolition, Earthworks & Construction	Trackout
ESR1	High	<20	N/A	Medium	N/A
ESR2	High	<20	N/A	Medium	N/A

The sensitivity is determined as **'Medium'** for Demolition, Earthworks and Construction.

Summary of Sensitivity of Surrounding Area

Table 4-8 summarises the sensitivity of the surrounding area to demolition, earthworks, construction and trackout activities.

Table 4-8: Summary of Risk of Impacts on the Sandflats

Activity	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	N/A

4.2.4 Define the Risk of Impacts

The risk of impacts for each activity was assessed using the criteria set out in Section 2.2.3 of this report, dust emission magnitude Table 4-1 and summary of sensitivity Table 4-5. Table 4-9 below summarises the assessment of risk for each activity to define site specific mitigation.

Table 4-9: Summary of Risk of Impacts

Activity	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	Low
Human Health PM_{10}	Low	Low	Low	Low
Dust Soiling (Ecological)	Medium	Medium	Medium	N/A

Risk of Dust Soiling Impacts

The risk of impacts for Demolition, Earthworks, Construction and trackout activities is assessed to be **Low**.

Risk of PM_{10} Impacts

The risk of human health impacts for Demolition, Earthworks, Construction and Trackout is assessed to be **Low**.

Risk of Dust Soiling Impacts (Ecological Receptors)

The risk of impacts for Demolition, Earthworks and Construction activities on ecological receptors is assessed to be **Medium**.

4.3 Conclusions of Dust Assessment

The risk of impacts for dust soiling and the health effects of PM_{10} were assessed at six human sensitive receptors in the vicinity of the site. The assessment results in the determination of a **Low** risk of dust soiling impacts and a **Low** risk of health impacts for Demolition, Earthworks, Construction and Trackout activities.

The risk of impacts for dust soiling were assessed at two ecological sensitive receptors in the vicinity of the site. The assessment results in the determination of a **Medium** risk of dust soiling impacts for Demolition, Earthworks and Construction activities.

The results of the assessment of the risk of impacts indicates that mitigation measures to control dust emissions that may arise due to demolition, earthworks, construction and trackout activities are adopted for the duration of the development in order to protect human sensitive receptors from dust impacts. The list of mitigation measures is detailed in Appendix B.

Given the requirement to adopt mitigation measures, EnviroCentre have also produced a Construction Dust Management Plan for the development (EnviroCentre Doc Ref: 13911). The Construction Dust Management Plan will be a live document, which will be updated as required throughout the construction of the development.

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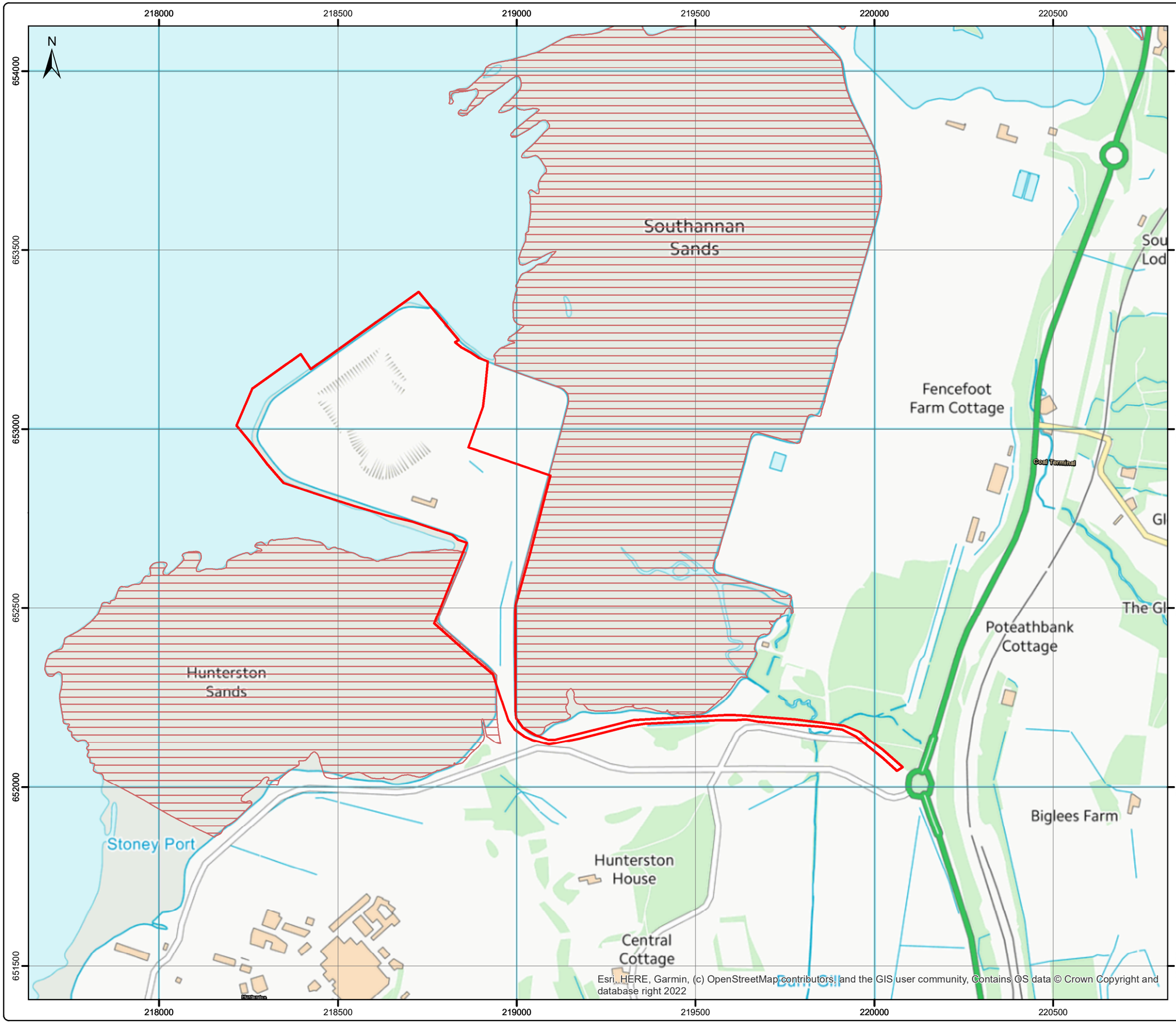
APPENDICES



Legend

- Site Boundary
- SSSI

Do not scale this map

Client
Clydeport Operations Limited

Project
Hunterston Construction Yard

Title
Site Location Plan

Status
FINAL

Drawing No.	Revision	Date
176482-GIS001	-	26 Jan 2024
Drawn	**Checked**	**Approved**
CP	MMF	EC

Scale
1:10,000 @A3
0 50 100 200 300 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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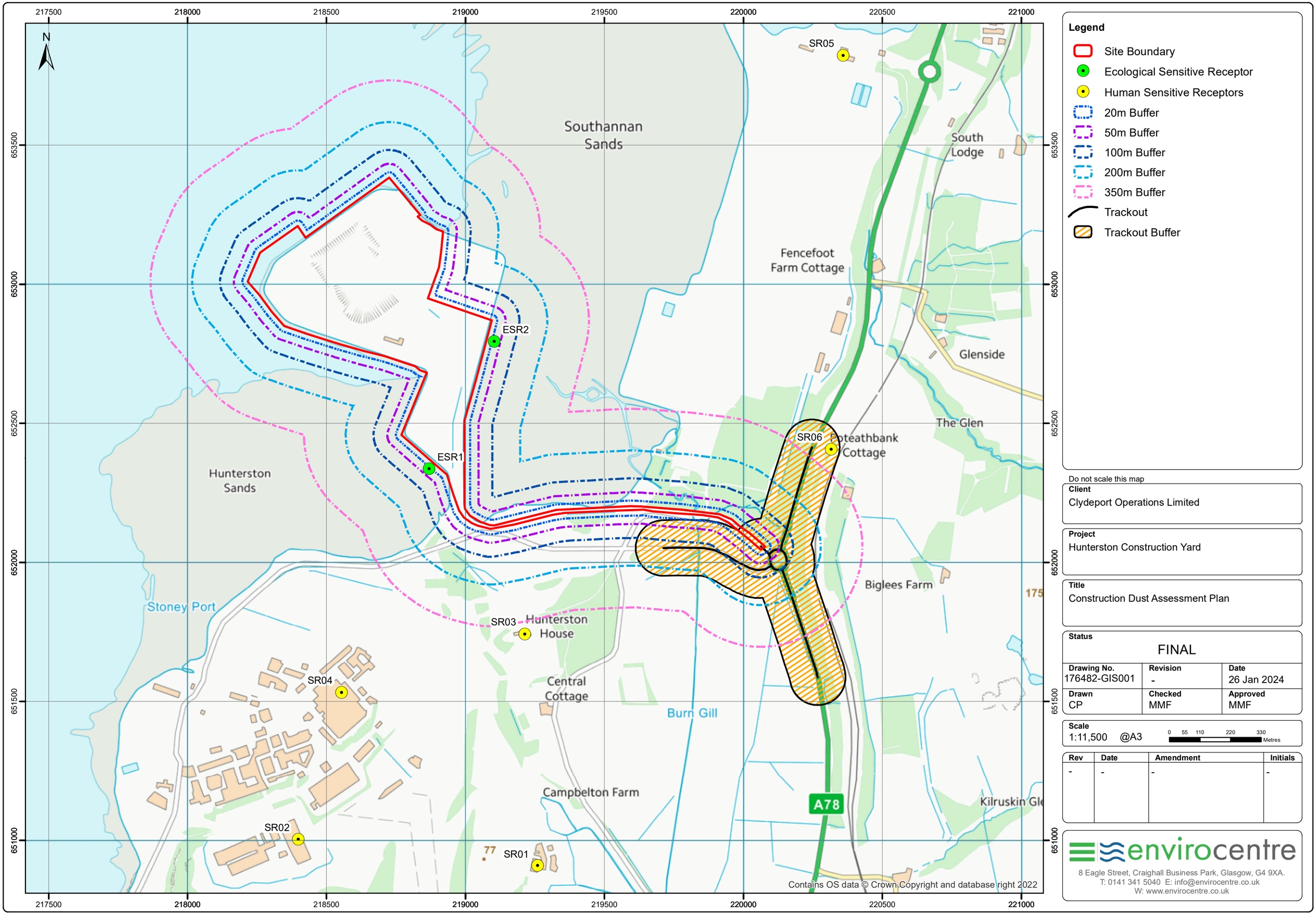

Legend

- Site Boundary
- Ecological Sensitive Receptor
- Human Sensitive Receptors
- 20m Buffer
- 50m Buffer
- 100m Buffer
- 200m Buffer
- 350m Buffer
- Trackout
- Trackout Buffer

Do not scale this map

Client
Clydeport Operations Limited

Project
Hunterston Construction Yard

Title
Construction Dust Assessment Plan

Status
FINAL

Drawing No.	Revision	Date
176482-GIS001	-	26 Jan 2024
Drawn	**Checked**	**Approved**
CP	MMF	MMF

Scale
1:11,500 @A3
0 55 110 220 330 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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A DRAWINGS

B MITIGATION MEASURES

Mitigation measures are divided into general measures applicable to all sites and measures applicable specifically to demolition, earthworks, construction and trackout for consistency with the assessment. For the measures categorised as general, the highest risk category should be applied. For example, if the site is medium risk for earthworks and construction, but high risk for demolition and trackout, the general measures applicable to a high-risk site should be applied. Therefore, in the case of the Hunterston Construction Yard, based on the determined risk for demolition, earthworks and construction; the general measures applicable for a medium risk site should be applied.

Key to tables:

H - Highly recommended

D – Desirable

N – Not required

General Mitigation Measures for All Sites:

Ref No.	Mitigation Measures	Medium Risk
Communications		
1.	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	H
2.	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	H
3.	Display the head or regional office contact information.	H
4.	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the measures set out in this document. The DMP may include monitoring of dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspections.	H
Site Management		
5.	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	H
6.	Make the complaints log available to the local authority when asked.	H

Ref No.	Mitigation Measures	Medium Risk
7.	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	H
8.	Hold regular liaison meeting with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. Understanding interactions of the off-site transport which may use the same strategic road networks is vital.	N
Monitoring		
9.	Undertake daily on-site and off-site inspection, to monitor dust, record inspection results, and make the log available to the local authority when requested. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.	D
10.	Carry out regular site inspections to monitor compliance record inspection results, and make an inspection log available to the local authority when asked.	H
11.	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H
12.	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	H
Preparing and Maintaining the Site		
13.	Plan site layout so that machinery and dust causing activities are located away from sensitive receptors, as far as is possible.	H
14.	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site	H
15.	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period	H
16.	Avoid site runoff of water or mud.	H
17.	Keep site fencing, barriers and scaffolding clean using wet methods.	H
18.	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	H
19.	Cover, seed or fence stockpiles to prevent wind whipping.	H
Operating Vehicle/Machinery and Sustainable Travel		
20.	Ensure all vehicles switch off engines when stationary - no idling vehicles.	H
21.	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	H

Ref No.	Mitigation Measures	Medium Risk
22.	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	D
23.	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	H
24.	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	D
Operations		
25.	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H
26.	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H
27.	Use enclosed chutes and conveyors and covered skips.	H
28.	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H
29.	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	H
Waste Management		
30.	Avoid bonfires and burning of waste materials.	H

Measures Specific to Earthworks:

Ref No.	Earthworks	Medium Risk
31.	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	D
32.	Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	D
33.	Only remove the cover in small areas during work and not all at once	D

Measures Specific to Construction:

Ref No.	Construction	Medium Risk
34.	Avoid scabbling (roughening of concrete surfaces) if possible	D

35. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	H
36. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	D
37. For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.	D

Measures Specific to Trackout:

Ref No. Trackout	Medium Risk
38. Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	H
39. Avoid dry sweeping of large areas.	H
40. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	H
41. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	H
42. Record all inspections of haul routes and any subsequent action in a site logbook.	H
43. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	H
44. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	H
45. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	H
46. Site access gate should be located at least 10m from receptors where possible.	H

Measures Specific to Demolition

Ref No. Demolition	Medium Risk
47. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible to provide a screen against dust)	D
48. Ensure effective water suppression is used during the demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to ground.	H
49. Avoid explosive blasting, use appropriate manual or mechanical alternatives.	H
50. Bag and remove any biological debris or damp down such material before demolition	H