ELTON 2 RESTORATION ENVIRONMENTAL PERMIT APPLICATION

Dust Management Plan

Prepared for: **Ingrebourne Valley Limited**

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BASIS OF REPORT

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1.0 Introduction

Ingrebourne Valley Limited (IV) has instructed SLR Consulting Limited (SLR) to prepare a Dust Management Plan (DMP) in support of an Environmental Permit application for the deposit of waste as a recovery operation for the restoration of Elton 2 (the Site), located near Warmington, Northants.

The implementation of this DMP shall be under the control of the Site management. This plan shall be incorporated into the Site procedures and shall be revised as necessary to ensure that it remains appropriate to the activities occurring on Site and that any changes in conditions relating to dust management are dealt with as part of those revisions. In particular, the monitoring procedures and compliance actions will be updated as required by the procedures within the DMP.

1.1 Scope

The objective of this document is to specify a range of measures to manage the environmental impacts that could arise during the activities taking place on Site, in respect of managing dust emissions. A series of site-specific control measures as described will therefore minimise potential risks to surrounding receptors and the environment.

The components of the DMP are set out within this document as follows:

Section 2 – Overview and Potential for Dust emissions;

Section 3 - Potential Dust Effects;

Section 4 - Dust Control Measures;

Section 5 - Site Management & Contingency Measures; and

Section 6 – Contingency Action Plan.

2.0 OVERVIEW & POTENTIAL FOR DUST EMISSIONS

2.1 Site Description

The Site location in shown in Drawing 01 and the Environmental Setting of the Site is illustrated on Drawing 03. The Site is approximately 20 hectares in size and prior to development consisted mainly of agricultural pasture used for livestock grazing. IV propose to extract ca. 850 – 900,000 tonnes of sand and gravel from the Site and restore it using in-situ materials and up to approximately 550,000m^3 imported inert waste.

2.2 Site Operations Description

The Site will be worked in three phases as shown in Drawing 04 Sequence of Operations. The planning permission requires the phases to be worked sequentially from east to west. Mineral extraction commenced in December 2021 and it is anticipated that the Site will be restored by 2030.

The Site will be restored using a combination of site-won overburden, silt from the processing of the mineral and imported inert wastes, with a final layer comprising replacement of the site-derived topsoil.

The Site will not be dewatered for mineral extraction or restoration; mineral will be extracted wet and restoration material will be placed into water. It is anticipated that restoration using inert waste and in-situ materials will be carried out for 9 months of each year in order to avoid the wetter winter months.

Articulated dump trucks (ADT) will be used to transfer the imported inert wastes from the processing area to the restoration area.

The proposed sequence of operations is as follows:

- A haul road and bailey bridge have been constructed within the material transfer part of the Site which connects the site to the separately permitted processing and waste storage area;
- Hydraulic excavators have commenced stripping topsoil and subsoil, which is transported by ADT for storage in the processing area;
- The working of the Site will proceed in 3 phases from east to west as illustrated in Drawing 04;
- Dewatering of the Site is not practical given the proximity to the River Nene and high groundwater level. Gravel will be extracted 'wet' from each area and be transported to the processing and waste storage area for washing;
- Mineral will be extracted down to the clay which underlies the sand and gravel seam. The underlying clay forms a natural geological basal barrier;
- During extraction of each phase, the clayey overburden will be used to construct an artificial side-wall attenuation barrier against the basal clay to restrict groundwater inflow;
- Imported inert waste will be transported from the processing and waste storage area and placed directly into water within the void;
- If the environmental permit determination time is excessively long, infilling of the first phase will commence with non-waste consisting of site-won overburden and silt from the mineral washing settlement lagoons;

Once the imported restoration materials have been placed to the required level, site-derived subsoil and topsoil will be replaced. Subsoil and topsoil will be transported by ADT from stockpiles in the processing area and a low ground pressure dozer will be used to spread the material loosely and avoid any compaction. The finished topsoil thickness will depend on the original amount removed but is expected to be 0.2m on average.

No waste or mineral is stockpiled on the Site; this is managed in the adjacent, separately permitted, processing area.

The only equipment and infrastructure on Site includes:

- Mobile excavation plant; and
- ADTs.

2.3 Site Surroundings

The Site lies to the north of the A605 and the village of Warmington, approximately 17 miles to the south-west of Peterborough.

A previous development, Elton 1, which has been restored to open water lies adjacent to the east of the site. The processing and waste storage area to the east of the Site will be used for mineral washing, silt settlement lagoons, storage of materials, storage and treatment of inert waste restoration materials. These activities are subject to a separate environmental permit. A bailey bridge and haul road has been constructed to transport extracted mineral and restoration materials between the processing and waste storage area and the Site.

The restoration area of the Site is surrounded on all sides by the River Nene and adjoining water courses and groundwater level is approximately 0.5 – 1m below the surface.

The nearest residential receptors are located 165m to the south in Warmington and Water Mill House, located approximately 200m to the south of the Site, is the nearest workplace receptor. The A605 Peterborough Road runs to the south of the side and adjacent to the haul road/material transfer area of the Site. The Site is crossed by the 'Nene Way' footpath and several other rights of way are located adjacent to the Site.

The closest designated habitat receptor is the River Nene located approximately 20m outside of the restoration area boundary on all sides. The River Nene is designated as a Fish Migratory Route for European eel. It is possible that Site operations may potentially impact on the ecological receptors given '*the greatest impacts will be within 100m of a source but may travel up to 400m. Smaller particles have the potential to persist beyond 400m but with minimal significance due to dispersion*'[1].

The closest Air Quality Management Area (AQMA) is located approximately 15.5km northeast of the site's boundary. The AQMA (Ref: AQMA No 1 – east of Peterborough between the City and Whittlesey) is designated for Sulphur dioxide (SO_2). The closest AQMA designated for particulate matter is the Wisbech Area AQMA approximately 15km to the northeast of the Site.

Based on the distance and classification of the AQMAs, Site operations are deemed to have no impact on the AQMAs and as such, the AQMAs are not considered further within this document.

Within the surrounding Site locale, there is some potential for other sources to release dust emissions. The predominant source within the immediate vicinity of the Site is considered to be the separately permitted Elton 2 processing and waste storage area to the East and the A605 to the south. The area to the north and west is predominately agricultural/open ground and numerous access tracks are scattered throughout the open ground which have the potential to generate dust. The local area within 1km from the site is considered to present limited potential sources of dust emissions.

2.4 Potential Dust Source

The preparation, construction and operations for the restoration of the Site have the potential to generate dust. However, the quarry will be worked and restored without dewatering, significantly reducing the dust potential on site. The potential dust sources can be divided into the following activities:

- handling of materials;
- on- site transportation;
- exposed surfaces;
- inert infilling operations; and
- restoration.

3.0 Potential Dust Effects

This section presents a review of the potential risk of dust effects and has been completed in order to inform the selection of appropriate dust control techniques to mitigate against the release of dust emissions.

3.1 Site operations

The Site will be excavated wet and restored by placing material into water. This provides immediate mitigation against the generation of dust.

3.2 Prevailing Meteorological conditions

The most important climatic parameters governing the generation and dispersal of fugitive dust are:

- wind speed will affect the potential for dust entrainment and the distance it may travel;

[1] Guidance on the Assessment of Mineral Dust Impacts for Planning. Institute of Air Quality Management, London

- wind direction determines the broad transport of the emission and the sector of the compass into which the emission is dispersed; and
- Rainfall is an important climatological parameter in the generation of dust; sufficient amounts of rainfall can suppress dust at the source and eliminate the pathway to the receptor. According to Arup (1995)[2] rainfall greater than 0.2mm per day is sufficient to suppress dust emissions.

3.2.1 Local Wind Speed & Direction

Wind speed and direction data from the meteorological observation station at Wittering meteorological station located 12km to the north of the Site, is considered to be broadly representative of the local Site conditions. A wind rose for Wittering is presented in Figure 1.

Figure 1 indicates that the prevailing wind direction is from the west and southwest. Winds from the north and east are relatively infrequent. On this basis, the locations in the east and northeast have the highest potential for impacts from any dust emissions originating from the Site.

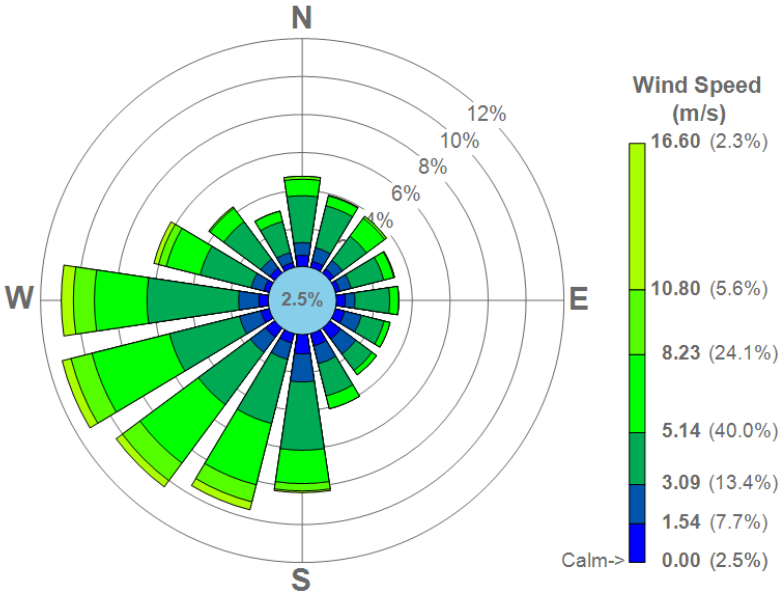

Figure 1 Windrose form Wittering Meteorological Station (2019)

3.2.2 Rainfall Data

Relevant rainfall data applicable to the Site has been obtained from the Met Office website[3] of UK mapped climate averages for 1981-2010. The average annual rainfall ≥ 1mm/day for the area of the Site is 112.6 days per

[2] Arup & Ove Arup Environmental. Environment Effects of Surface Mineral Workings. DoE, October 1995

[3] Wittering (Peterborough) UK climate averages - Met Office

year, comprising approximately 30% of the year. It is therefore considered that on those days the natural suppression afforded by the rain would eliminate all sources of dust across the Site.

Rainfall is typically lower in the summer months, combined with higher temperatures to increase the drying time of material. The potential for dust generation and subsequent transfer of airborne dust emissions beyond the Site boundary is therefore higher during the summer months.

3.3 Sources of Dust

3.3.1 Designed in Dust Control Measures

The following measures that are incorporated into the working scheme are considered to afford a degree of reduction in the potential for dust generation. These "designed in" control measures are presented in Table 1.

Table 1 Designed in Dust Control Measures

Activity	Designed in Dust Control Measures
Management Procedures	The Site supervisor, or his nominee, will exercise day to day control on Site at all times. They will have particular responsibility for ensuring full compliance with the conditions attached to the Environmental Permit. They will assume control either personally or by delegation to suitably trained and responsible staff of: • Vehicle movements; • All loading, tipping and materials handling operations; • Operation of dust suppression measures; and • Inspection, cleaning and maintenance of all plant and equipment. All staff will receive necessary training and instruction in their duties relating to the control of all operations and the potential sources of dust emissions. Site staff will inform the manager whenever visible dust emissions are observed or appear likely to occur, as a result of any Site operation. If at any time dust emissions likely to cause a nuisance beyond the Site boundary are detected by the Site staff or any complaints relating to dust is received, the incident will be recorded in the Site Diary, and immediate action taken to identify the cause of the problem. If a dust associated problem is related to a specific source of waste, then action will immediately be taken to suppress any aerial emissions by damping down or covering the waste with non-dusty materials.
Complaints Procedure	A complaints procedure will be established to ensure that any perceived nuisance being caused to local residents is dealt with effectively. A register of complaints will be kept on site to record all concerns made either directly to the Site Manager or via the regulatory authorities. Each complaint will be investigated and in the event of a complaint received it will be dealt with on the same working day. The Site Manager will report the findings and any action taken to the Management Team. The EA will be advised in writing within two weeks of any dust complaint together with the findings of the investigation and any corrective action.
Transportation of Materials	Internal haulage will be restricted to clearly delineated surfaces, on a prepared surface at low level where possible. A water bowser will be available to suppress dust emissions.

Activity	Designed in Dust Control Measures
	All Site vehicles will be maintained in accordance with the manufacturer's manual. Vehicle exhausts will be pointed upwards. The Site will benefit from good housekeeping including the regular sweeping of road surfaces. Site haulage will follow site speed limits to minimise the mobilisation of dust particles. All drivers, including visitors, will be made aware of the Site's commitment to minimising dust. The Site supervisor will be responsible for checking the situation with regard to dust on a regular basis throughout working hours, and for ensuring that mitigating measures are provided as necessary. HGVs transporting dusty materials will be sheeted.
Material Handling	Only inert waste will be accepted. Most areas will be worked wet, however when necessary, working areas will be sprayed with water via a bowser. In unusually dry/windy conditions site activities will be suspended if it appears likely dust may be carried towards sensitive receptors.

The activities on Site that have the greatest potential for dust emissions have been identified as handling of waste, vehicle movements, and deposition of waste. Table 2 outlines the potential sources of dust associated with the proposed operations.

Table 2 Sources of Dust

Activity	Potential for Dust Generation	Description / Location
Handling of materials	Medium (predominately wet material)	Temporary operations. Potential for short term high dust emissions.
On-site transportation	Medium	Dust will be created by the movement of the on-site vehicles transporting restoration material to the Site, particularly during dry spells.
Infilling and contouring of waste	Medium	Up to approximately 550,000 tonnes of imported waste will be deposited and contoured to the appropriate landform in compliance with the restoration scheme. The infill material is placed into water.
Restoration	Medium	Restoring the area to agricultural use by depositing the topsoil previously stripped from the area.
Off-site transportation (track out)	Low	Excavation plant and ADT vehicles used for the transportation of material from the process area for restoration are used on-site only and will not use public roads or the processing area access road.

3.4 IAQM Assessment of Dust Impacts

In support of this environmental permit application, a dust impact assessment in accordance with the IAQM guidance[4] 'Guidance on the Assessment of Mineral Dust Impacts for Planning' has been undertaken.

The IAQM mineral guidance presents a simple distance-based screening process to identify those mineral sites where the dust impacts are unlikely to be significant and require further assessment. Where a more detailed assessment is required, a basic assessment framework is presented which employs the Source – Pathway – Receptor approach to evaluate the risk of dust impacts and effects.

The EA's DMP template requires a consideration of sensitive receptors, and so all sensitive receptors within 1km are listed in Table 3. However, IAQM guidance states that "where there are no receptors near to a mineral site there will be no significant effect". This is because at mineral operations, "the change in both airborne concentrations and the rate of deposition with distance, suggests that dust impacts will occur mainly within 400m of the operation, even at the dustiest of sites". Thus, dust is unlikely to have more than a negligible impact on receptors beyond 400m. On the basis of the IAQM screening criteria, an assessment of both deposited dust and PM10 has been undertaken on dust sensitive receptors located within 400m of the on-site activities.

Table 3 Identified Receptors

Ref No.	Receptor	Grid Reference		Distance from Site Boundary (m)	IAQM Distance	Direction from Site Boundary
		X	Y			
1	Protected habitat			-	Close	The site
2	River Nene/River Nene protected species (brown trout, eel, eel migratory route, Bullhead and Water Vole)	507034	292046	Adjacent	Close	All directions
3	Public footpaths/bridleways	507628	291812	Adjacent	Close	North and south
4	Surface water drains	506954	292112	20	Close	North, south and west
5	Agricultural land	506820	291985	25	Close	North, south and west
6	Eaglethorpe New Lake (Elton 1 shallows)/ Elton 1 reservoir	507678	292091	80	Close	East
7	Elton 2 processing and waste storage area	508058	292200	Adjacent	Close	East
8	A605	507502	291658	110	Intermediate	South
9	Schedule II Listed building	507509	291610	140	Intermediate	Northeast, south, southwest and northwest
10	Water Mill House	507408	291637	150	Intermediate	South

[4] Guidance on the Assessment of Mineral Dust Impacts for Planning, May 2016 (v1.1), Institute of Air Quality Management (IAQM) http://www.iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf accessed November 2019

Ref No.	Receptor	Grid Reference		Distance from Site Boundary (m)	IAQM Distance	Direction from Site Boundary
		X	Y			
11	Warmington	507687	29567	165	Intermediate	South
12	Playing fields	507849	291571	275	Intermediate	Southeast
13	Commercial properties	507735	291516	370	Intermediate	South
	Allotment	507627	291333	490	Distant	South
	Schedule II* Listed Building	507703	291284	600	Distant	Northeast, south, southwest and northwest
	Little Green Moated Site	507948	291450	600	Distant	Southeast
	Schedule I Listed Building	507740	291014	850	Distant	Northeast, south, southwest and northwest
	Fotheringhay Motte and Bailey Castle	506316	292902	1000	Distant	North

NB – Receptors on white lines are within IAQM's recommended 400m radius.

The background concentrations of PM10 at the Site and the surrounding locale were obtained from UK AIR Information Resource (UK AIR) [56]. The maximum 2020 concentration at the Site is 14.97 µg/m3.

In accordance with the IAQM mineral guidance, 'If the long-term background PM10 concentration is less than 17µg/m3 there is little risk that the Process Contribution (PC) would lead to an exceedance of the annual-mean objective'. No further consideration of PM10 emissions is therefore required as the effects can be considered to be 'Not Significant'.

Further assessment of dust emissions was undertaken in accordance with the methodology contained within the IAQM minerals guidance. The Magnitude of Dust Effects were calculated for each relevant receptor within 400m, using the following methodology.

1. Identification of Residual Source Emission Category
2. Quantification of Frequency of Dusty Winds
3. Categorisation of Receptor Distance
4. Calculation of Pathway effectiveness (using 2 and 3)
5. Estimation of Dust Impact Risk (using 1 and 4)
6. Identification of Receptor Sensitivity
7. Calculation of Magnitude of Dust Effects (using 5 and 6)

[5] DEFRA UK Air Information Resource (UK-AIR) website, available at https://uk-air.defra.gov.uk/data/laqm-background-maps, accessed October 2020

3.4.1 Residual Source Emissions

The first step towards determining the impact of the dust from Site operations on the local receptors is the determination of the residual source emissions applicable to the Site. The operations were broken down into six activities, as detailed in Section 3.3.

3.4.2 Frequency of Dust Winds

In Table A3-2 of Appendix 3 to the IAQM guidance, which has been replicated in Table 4 below, IAQM provides the following thresholds for determining the frequency of dust winds between an activity and a receptor:

Table 4 Criteria to Determine Frequency of Dust Winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

For each receptor, the Wind Rose in Figure 1 was used to observe the average windspeed and distance in each direction. This data was then compared to the thresholds given in Table 4 of this document to determine the probable frequency of dust winds between the site and receptor in question. The following frequencies were calculated:

Protected habitat – Moderately frequent

River Nene/River Nene protected species – Moderately frequent

Public Footpath - Infrequent

Surface water drains - Infrequent

Agricultural land - Infrequent

Eaglethorpe New Lake/Elton 1 reservoir – Moderately frequent

A605 - Infrequent

Schedule II Listed Building – Moderately frequent

Water Mill House - Infrequent

Warmington – Infrequent

Playing fields – Infrequent

Commercial properties – Infrequent

Elton 2 processing and waste storage area – Moderately frequent

3.4.3 Receptor Distance

Table A3-3 of the IAQM guidance states that receptors less than 100m from the source are 'close', between 100 and 200m from the source are 'intermediate' and between 200-400m from the source are 'distant'. Using the IAQM guidance, distances were assigned to the thirteen receptors within 400m of the Site, as detailed in Table 3.

3.4.4 Pathway Effectiveness

The frequencies of dust winds from section 3.4.2 and the receptor distances from Table 3 were then used to calculate the pathway effectiveness, in conjunction with the framework given in Table A3-4 of the guidance. The following pathway effectiveness was determined for each receptor:

Protected habitat: Close + Moderately frequent = **Moderately Effective**

River Nene/River Nene protected species: Close + Moderately frequent = **Moderately Effective**

Public Footpath: Close + Infrequent = **Ineffective**

Surface water drains: Close + Infrequent = **Ineffective**

Agricultural land: Close + Infrequent = **Ineffective**

Eaglethorpe New Lake/Elton 1 reservoir: Close + Moderately frequent = **Moderately Effective**

A605: Intermediate + Infrequent = **Ineffective**

Schedule II Listed Building: Intermediate + Moderately frequent = **Moderately Effective**

Water Mill House: Intermediate + Infrequent = **Ineffective**

Eaglethorpe: Intermediate + Infrequent = **Ineffective**

Playing fields: Intermediate + Infrequent = **Ineffective**

Commercial properties: Intermediate + Infrequent = **Ineffective**

Elton 2 processing and waste storage area: Close + Moderately frequent = **Moderately Effective**

3.4.5 Dust Impact Risk

The Dust Impact Risk between each activity and each receptor was then calculated using the residual source emissions and the pathway effectiveness. The pathway effectiveness and residual source emissions scores were input into the framework given in Table A3-5 of Appendix 3 to the IAQM guidance.

The results of this step are presented in Table 5 below. The screening step identified that the activities with the highest dust impact risk (medium), were all identified as having a negligible or low dust impact risk on all receptors identified.

Table 5 Dust Impact Risk Calculations

		Pathway Effectiveness for Each Receptor												
		Protected habitat – *moderately ineffective*	River Nene/River Nene protected species - *moderately effective*	Public footpath - *ineffective*	Surface water drains - *ineffective*	Agricultural Land - *ineffective*	Eaglethorpe New Lake/Elton 1 reservoir - *moderately effective*	A605 - *ineffective*	Schedule II listed building - *moderately effective*	Water Mill House - *ineffective*	Warmington - *ineffective*	Playing fields - *ineffective*	Commercial Properties - *ineffective*	Elton 2 processing and waste storage area - *moderately effective*
Residual Source Emissions	Handling of materials - *Medium*	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk	Negligible Risk	Low Risk	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Low Risk
	On-site transportation - *Medium*	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk	Negligible Risk	Low Risk	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Low Risk
	Infilling / contouring - *Medium*	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk	Negligible Risk	Low Risk	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Low Risk
	Restoration – *Medium*	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk	Negligible Risk	Low Risk	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Low Risk
	Off-site transportation - *Small*	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk

3.4.6 Receptor Sensitivity

IAQM guidance (Box 4) identified that all the receptors have been assessed as high to low sensitivity receptors, including the footpath, residential, commercial buildings, and the priority habitats.

3.4.7 Magnitude of Dust Effects

The final step is combining the receptor sensitivity with the dust impact risk from the highest scoring activity, screening of waste, for each receptor. After this, it was possible to determine the magnitude of dust effect that the site could reasonably be expected to have on each receptor, as given below:

Protected habitat: Low Sensitivity + Low Dust Impact Risk = Negligible Effect

River Nene/River Nene protected species: Low Sensitivity + Low Dust Impact Risk = Negligible Effect

Public Footpath: Low Sensitivity + Low Dust Impact Risk = Negligible Effect

Surface water drains: Low Sensitivity + Low Dust Impact Risk = Negligible Effect

Agricultural land: Low Sensitivity + Low Dust Impact Risk = Negligible Effect

Eaglethorpe New Lake/Elton 1 reservoir: Low Sensitivity + Low Dust Impact Risk = Negligible Effect

A605: Low Sensitivity + Low Dust Impact Risk = Negligible Effect Negligible Effect

Schedule II Listed Building: Low Sensitivity + Low Dust Impact Risk = Negligible Effect

Water Mill House: High Sensitivity + Low Dust Impact Risk = Slightly Adverse Effect

Warmington: High Sensitivity + Low Dust Impact Risk =Slightly Adverse Effect

Playing fields: Low Sensitivity + Low Dust Impact Risk = Negligible Effect

Commercial properties: Medium Sensitivity + Low Dust Impact Risk = Negligible Effect

Elton 2 processing and waste storage area: Medium Sensitivity + Low Dust Impact Risk = Negligible Effect

3.5 Dust complaints

No complaints were received regarding dust emissions from previous operations at IV's neighbouring Elton 1 site.

4.0 CONTROL OF DUST EMISSIONS

4.1 Overview

IV recognises the potential for the Site to generate dust emissions and is committed to excavating, preparing, operating and restoring the Site in accordance with industry best practice. The implementation of industry best practice measures to control and mitigate the generation and transportation of dust can ensure that dust is adequately controlled.

The dust control measures contained within this DMP have been defined on the basis of the findings of the IAQM dust impact assessment and regulatory guidance as follows:

- IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning (2016);
- Mineral Industry Research Organisation (MIRO) Good practice guide: control and measurement of nuisance dust and PM10 from the extractive industries (AEA, 2011); and

- Local Air Quality Management (LAQM.TG (16)) (Defra, 2018).

The key method for controlling dust emissions is through good site design, management practices and subsequent good housekeeping, i.e. avoidance of dust generation.

4.2 Dust Control Measures

Dust control measures that will be employed at the Site as part of routine planning and operations are detailed below in Tables 6, 7 and 8

Table 6 General Site Control Measures

Activity	Control Measures
Design and Location of dust–generating activities	Dust-generating activities will, where possible, be located where maximum protection can be obtained from topography and other sheltering features. No materials will be stockpiled within the permit boundary. Exposed areas will be located as far away as possible from sensitive receptors, within the constraints of the permitted area. Where practicable they should not be located directly upwind of the sensitive receptors.
Equipment and vehicles	The Site has been designed to minimise haul route distances and to locate haul routes away from receptors, where possible within the constraints of the permitted boundary.
Communication	Good communication will be maintained to prevent anxieties between the operator and the surrounding communities. Regular, accessible liaison arrangements will be implemented in order to provide information as freely as possible.
Training	Training on dust mitigation will be provided to Site personnel. Training will also cover 'emergency preparedness plans' to react quickly in case of any failure of the planned dust mitigation.
Monitoring	Refer to Section 4.3
Management	All dust and air quality complaints will be recorded. The cause will be identified, and appropriate measures taken. See Section 5.0.

Table 7 Activity Specific Preventative Dust Control Measures

Activity	Management Actions and Preventative Dust Control Technique	Trigger for Implementation
Handling of materials	Handling of dusty material will be avoided during particularly dry and windy conditions.	Control measures will be implemented during all periods when the Site is operational.
On-site transportation	All vehicles will adhere to the Site speed limit of 10mph. Controlled use of fixed routes.	Control measures will be implemented during all periods when the Site is operational.

Activity	Management Actions and Preventative Dust Control Technique	Trigger for Implementation
	Abrupt changes in direction will be avoided. Roads will benefit from regular grading and maintenance by dozer and dressed aggregates. Necessary repairs to the surface will be instigated as soon as reasonably practicable. Vehicle exhausts to be angled upwards. Adequate water supply will be provided for effective dust mitigation. Vehicles will be evenly loaded to avoid spillages. Excavators and ADTs are based on the site only and do not use public roads or the process area access road.	
Infilling and contouring of waste	Good standards of all plant and equipment will be maintained. Drop heights will be minimised when unloading inert material from ADTs. The Site will be restored 'wet'; material will not be dropped, but will be pushed into water.	Control measures will be implemented during all periods when the Site is operational.
Maintenance of haul road	The internal road will benefit from regular maintenance. Necessary repairs to the surface will be instigated as soon as reasonably practicable.	Control measures will be implemented during all periods when the Site is operational.
Restoration	Soil replacement activities will be planned to take into consideration seasonal weather variations and seeding practices for restoration scheme. Handling of soils will be avoided during adverse weather conditions. Progressive restoration to minimise the exposed mineral area. In the event that visible plumes of dust emissions are identified crossing the EP boundary, operations will cease until dust can be satisfactorily managed.	Control measures will be implemented during all periods when the Site is operational. Daily monitoring will aid implementation decision making.

Table 8 Activity Specific Remedial Dust Control Measures

Activity	Management Actions and Remedial Dust Control Techniques	Trigger for Implementation
Handling of materials	Dampening of material by water bowser as and when required.	Visible dust plumes carried towards / across site boundary.
On-site transportation	Sweeping of site using a road brush; and Dampening of roads.	Visible dust plumes carried towards / across site boundary.

Activity	Management Actions and Remedial Dust Control Techniques	Trigger for Implementation
		Visible track out on the access road.
Infilling	Dampening of material.	Visible dust plumes carried towards / across site boundary.
Maintenance of haul road	Use of a water bowser.	Visible dust plumes carried towards / across site boundary.
Restoration	Use of a water bowser.	Visible dust plumes carried towards / across site boundary.

The remedial dust control measures outlined above would be undertaken until the dust emissions were contained within the site boundary and significantly reduced. The decision would be at the discretion of the Site Supervisor.

4.3 Monitoring

4.3.1 Meteorological Conditions

During the preparation, operational and restoration phases weather forecasts will be monitored on a daily basis to predict weather conditions such as prolonged dry, hot spells or significantly strong winds which may generate elevated levels of dust for which additional dust control would need to be planned / prepared. Using this information, the necessary precautionary measures will be planned or employed on the Site, and if necessary, suspension or relocation of certain activities may be undertaken.

Wind direction and wind speed will be recorded on a daily basis within the Site log book or using the example record sheet in Appendix 01. This information is beneficial when dust events/complaints are reviewed retrospectively, and the source of dust is trying to be identified.

4.3.2 Visual Dust Monitoring

Regular visual monitoring of the Site will be undertaken to ensure that dust control techniques are being carried out effectively. The objective of the visual monitoring is to anticipate whether dust is being transported off-site in quantities sufficient to cause a nuisance at off-site receptor locations.

Visual monitoring of dust will be undertaken by the site supervisor on a minimum of a daily basis. Responsibilities can either be delegated to various site operatives to carry out visual observations of their working areas during normal operations or be delegated to a single operative to perform daily visual checks of key areas.

The areas that require consideration for inclusion within the visual observations are as follows:

- Any areas where soil stripping activities are being taken within the EP boundary;
- Inert infilling;
- Maintenance of haul road; and
- Restoration of site to agricultural use.

Results of the visual observations will be recorded in the Site log book which is kept in the Site office (an example Pro-Forma is included in Appendix 02). The following details shall be noted:

- Weather conditions (rainfall, wind speed, wind direction);

- Current site activities;
- Identification of any visible dust emissions travelling beyond the Site boundary;
- Details of any remedial action undertaken as a result.

The frequency of visual monitoring will be increased to twice daily observations in the following scenarios:

- Regular observations detect significant dust plumes crossing the Site boundary towards off-site receptors;
- Site operatives inform the Site Manager of significant dust emission within 100m of a Site boundary; and
- In response to a complaint being received by the Site or EA.

5.0 SITE MANAGEMENT & CONTINGENCY MEASURES

This section details the responsibilities with regards of the Site Management with regards to the DMP, as illustrated in Figure 2.

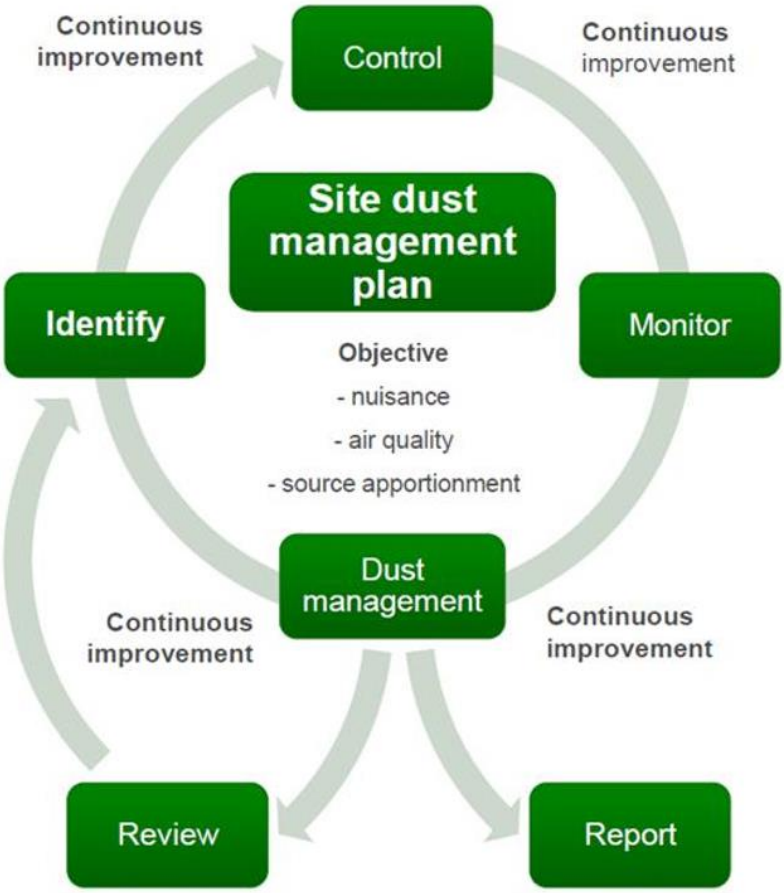

Figure 2 Dust Management Plan Responsibilities

5.1 Responsibilities

There will be a trained Site supervisor / manager on Site during working hours responsible for dust management and visual observations. The Site supervisor will be responsible for ensuring effective dust control is achieved by good operational practises, including:

- identifying and monitoring the intensity of activities with a high potential for dust generation;
- monitoring weather conditions during periods of such activity;
- planning and preparing for the implementation of contingency measures;
- responding to potential and actual dust monitoring issues; and
- ceasing operations in the event that significant off-site impacts cannot be avoided.

Responsibilities will be allocated to specific personnel to ensure dust generation is avoided or effectively controlled, as presented in Table 9.

Table 9 Dust Management Plan

Actions	Responsibility
Monitoring weather forecasts and current wind directions on Site	Site Manager
Routine visual observation monitoring	Site Manager
Coordination of application of water dust suppression	Site Manager
Completion of dust event forms	Site Manager
Activation of contingency action plans	Site Manager
Liaison with public and regulator	Site Manager
Coordinating reviews and updates of DMP	Site Manager

5.2 Training

All personnel on Site will understand their responsibility to ensure the generation of dust is avoided, minimised and controlled. Each employee shall be made aware of the importance of effective dust control and the most effective measures available to minimise such emissions from the various activities. Such training shall be provided as part of the induction process for all new employees.

Specific training will be provided to:

- operatives in use of the water suppression techniques; and
- all site personnel on the importance of reporting potential / actual dust emissions or the malfunctioning of dust control to the appropriate person.

Training will also cover ‘emergency preparation plans’ to ensure rapid reactions to any failure of dust control.

5.3 Incident Reporting

Incidents of high dust levels will be reported to the Site Manager and recorded in the daily logbook. Any incidents that have created significant dust issues off site shall be reported to the EA as appropriate.

5.4 Dust Complaint Procedure

Complaints may be notified by a member of the public either directly to the Site management or indirectly through the regulator. Complaints received directly by the Site management will be recorded in the Site log book and reported to the regulator. In the event of a complaint received they will be dealt with on the same working day. The following details shall be recorded in the Complaint and Investigation Record Form, included as Appendix 03:

- date, time and name of complainant (if provided);
- nature of complaint;
- locality of complaint;
- summary of resulting investigations and actions taken; and
- date at which the complainant was updated with the outcome / remedial actions undertaken, if required.

The objective of this response to complaints received is to investigate the incident and review the Site practises and dust controls in place at the time of the event to allow for additional controls to be put in place, thus preventing a repeat of the incident. If necessary, the complainant(s) and the regulator would be informed of the findings of the investigation and any actions subsequently taken.

Investigations will include, but not be limited to the following:

- Visit by a member of Site Management to the location of the complaint, to verify the issue (If complaint is made after the event this may not be possible);
- A review of Site activities in operation at the time of the incident;
- A review of the dust monitoring results for the period of the incident, if applicable;
- For recurring events, the frequency of visual monitoring should be increased to a twice daily basis;
- A review of control measures and dust suppression in place at the time of the incident (i.e. application of water, drop heights during transfer etc)
- A review of the meteorological conditions at the time of the incident (i.e. recorded wind direction and wind speed recorded in the Site log book); and
- Reporting of findings (in Appendix 03 complaints and investigation record form).

The escalation procedures in the event that subsequent dust complaints are received are as follows:

- Initial Complaint – Initial/ first time contact received – complaint investigated, and contingency actions taken by Site management.
- Complaint Level 1 – An interaction that has not been resolved to the satisfaction of the complainant or where frequent contact has been received from the public via the regulators. Complaints investigated by senior management team and remedial actions taken.

- Complaint Level 2 – Unresolved complaint – this may involve support from Environmental Consultants to review, investigate, determine required actions and respond to the complaint.

The typical timescale within which IV respond to a complaint on Site can vary depending on how the complaint is raised. However, on a worst-case basis, complaints will be dealt with on the same working day and responded to within 7 days with a formal written response. Within this response time, action will be occurring on Site to investigate and correct any issues which the complaint has drawn attention to.

5.5 Liaison with Community Regulators

The Site Manager (or nominated representative) shall act as a liaison with the regulator and local community for issues relating to dust emissions off-site. Maintaining good communications with the local community will help prevent anxieties occurring.

If appropriate key issues will be communicated between both sides, including but not limited to the following:

- Presentation of the monitoring scheme and the latest dust monitoring results;
- Update on the working scheme of the Site and when/where future operations will be;
- Summary of the dust controls on Site and any updates/improvements undertaken/planned;
- Provision of a contact for the Site should any issues arise between the meetings; and
- Observe and alleviate any anxieties or complaints member of the public have experienced.

5.6 Record Keeping

IV will keep records of all dust monitoring, dust contingency actions, investigations and complaints on Site for a minimum period of 2 years; these shall be made available to the regulator for examination on request.

5.7 DMP Update and Review

This DMP is an active, controlled document which forms part of the Site management documentation. It shall be reviewed on an annual basis, as a minimum by senior site management. Given that the document is a point of reference for daily operations, it shall be updated as required should any of the following situations occur:

- significant changes are made to the plant or operational practices;
- the regulator specifically requests for the DMP to be updated; or
- following investigations into dust control, additional measures are adopted that are not contained within the document.

On review of Site operations and the effectiveness of the DMP, senior management are required to make any changes deemed appropriate to ensure dust emissions are kept to a minimum.

6.0 CONTINGENCY ACTION PLAN

A contingency action plan has been defined to react to situations whereby visual monitoring of dust indicates that a potential dust source is not being mitigated effectively, appropriate control measures are not in place or that an adverse impact has / may occur.

This includes incidents or accidents which would result in the loss of control of potential dust sources and have the potential to cause an unacceptable impact on the environment. The contingency action plan therefore includes both pro-active and re-active actions to events.

Contingency measures have been identified for the following scenarios, as presented in Table 10.

- observed change in wind direction towards nearby receptors during activities close to Site boundary;
- visual monitoring records visible dust plumes across the Site boundary in the direction / proximity to the off-site receptors;
- malfunction in water suppression techniques rendering them in-effective;
- malfunction of road sweeper rendering it in-effective;
- receipt of a particularly dusty load (inert material for infilling);
- complaints received from members of the public or neighbouring businesses, verified by visual monitoring on site; and
- prolonged periods of hot weather, resulting in very dry ground and limited supply of water

Table 10 Contingency Plans

Event	Change in Wind Direction (med-high wind) towards off-site receptors.
Contingency Actions	The frequency of visual monitoring will increase to twice daily which will incorporate walkovers along boundary in question Additional dust suppression will be implemented on high-risk activities using water sprays, reduction in drop heights or cessation of material handling / transfer In the event dust is visually observed to be crossing the boundary with additional dust suppression in place, any activities will be relocated or ceased until more effective mitigation is in place.
Comment	The weather forecasts will be monitored. The Site Manager will be informed of actions taken and the event will be recorded in the site logbook.
Event	Visual monitoring records dust plumes across Site boundary in direction of offsite receptors
Contingency Actions	The frequency of visual monitoring will increase to a minimum of twice daily, which will incorporate a walkover along the boundary in question. Wind direction will be determined. The likely dust source will be determined, and additional dust suppression will be implemented e.g. increased frequency of water suppression on internal roads and commence water suppression on material using manual techniques on site. If additional dust suppression not effective, activity operations will be relocated or ceased until dust can be satisfactorily controlled.
Comment	Water supply will be available for high-risk activities. The Site Manager will be informed of actions taken and the event will be recorded in site logbook.

Event	Malfunction of water suppression techniques, rendering them ineffective
Contingency Actions	Repairs will be undertaken using on-site spares if possible, or a technician will be called to repair at earliest opportunity. During periods of high dust risk (dry, hot or windy weather) a replacement bowser will be procured if the repairs cannot be made within 24 hours. Manual methods will be undertaken to clean down vehicles. The frequency of visual monitoring will increase to twice daily, which will incorporate a walkover of the all the boundaries. Manual water techniques will be available on site and at the location of the dust source.
Comment	Essential spares will be retained on site The Site Manager will be informed of actions taken and the event will be recorded in site logbook.
Event	Receipt of a particularly dusty load (inert material for infilling)
Contingency Actions	Management will be notified, and receipt records will be updated. All incoming restoration material is firstly stored in the processing area adjacent to the restoration permit area. If a particularly dust load is accepted it will be dampened in the treatment area before being transported to the restoration site. Loads will be investigated to ascertain whether they can be received without causing dust emissions to leave site. The following will be reviewed: • use of additional mitigation, e.g. use of water bowser during unloading. Ultimately, if waste cannot be received without dust emissions causing an unacceptable impact, then receipt of load will cease, and the carrier will be informed.
Comment	Details will be recorded in site logbook.
Event	Complaints received from members of the public or neighbouring businesses, verified by visual monitoring on site
Contingency Actions	Management will be notified. Complaint reporting and investigation procedure will be undertaken, and appropriate contingency measures will be undertaken as detailed above. The frequency of visual monitoring will increase to twice daily and will focus on boundary locations in proximity to the location of complainants. If required, correspond with the Environment Agency to discuss the requirement of quantitative dust monitoring. Complaint escalation procedure: • Initial Complaint - Initial/first time contact received – complaint investigated, and contingency actions taken by site management. • Complaint level 1 - An Interaction that has not been resolved to the satisfaction of the complainant or where frequent contact has been received from the public via the Regulators. Complaints investigated by senior management team and remedial actions taken. • Complaint level 2 Unresolved Complaint level 1 – this may involve support from Environmental Consultants to review, investigate, determined required actions and respond to the complaint.

Comment	DMP may require updating on basis of results of investigations.
Event	Malfunction / inadequate supply of water for dust suppression
Contingency Actions	The frequency of visual monitoring will increase to twice daily and will focus on boundary locations in proximity to the location of complainants. All other dust control measures will be adhered to. If required, water will be imported and used for the water bowser. In the event dust is visually observed to be crossing the boundary with additional dust suppression in place, any activities will be relocated or ceased until more effective mitigation is in place
Comment	Details will be recorded in the Site logbook.
Event	Prolonged periods of hot weather, resulting in very dry ground and limited supply of water
Contingency Actions	Water suppression techniques to be prioritised for operational activities occurring closest to the off-site receptors. If water supply on Site has significantly reduced, consider importing water onto Site. Increase daily monitoring to twice daily and if dust is being released in significant quantities likely to cause impact then cease activities.
Comment	Inform Site manager of actions taken and record in Site logbook

APPENDIX 01

Example Meteorological Condition Record Sheet

Date	Initials of Author	Predominant Wind Direction	Wind Speed (Beaufort scale)	Rainfall	Areas of Working	Additional Comments (On- and Off-site)
11/02/17 Example	*AB*	*W- NW*	*1-2 Light air – light breeze*	*Dry*	*Topsoil Stripping*	*Agricultural operations in field adjacent to Site active with visible dust emissions*

Beaufort Scale Definitions:

0 – Calm

1 – Light air

2 – Light breeze

3 – Gentle breeze

4 – Moderate breeze

5 – Fresh breeze

6 – Strong breeze

7 – Near gale

8 – Gale

9 – Strong gale

10–Storm

APPENDIX 02

Visual Observation Record Form

Visual Observations Record Form	
Name of Author	
Description of Event[a]	
Date / Time / Period	
Activities taking place during time / period of event:	
Dust control employed at the time of the event:	
Summary of weather conditions leading up to and during the event:	
Details of Corrective Action:	
Notes:	

(a) E.g. complaint registered (name and address) or visible dust seen crossing site boundary during routine visual monitoring

APPENDIX 03

Complaint and Investigation Record Form

Customer Details	
Customer Name	
Address Postcode	
Telephone	
Email	
Date	
Complaint Ref Number	
Complaint Details	
Investigation Details	
Investigation carried out by	
Position	
Date & time investigation carried out	
Weather conditions	
Wind direction and speed	
Investigation findings	
Feedback given to Environment Agency and/or local authority	
Date feedback given	

Customer Details	
Feedback given to public	
Date feedback given	
Review and Improve	
Improvements needed to prevent a reoccurrence -	
Proposed date for completion of the improvements -	
Actual date for completion -	
If different insert reason for delay -	
Does the dust management plan need to be updated -	
Date that the dust management plan was updated -	
Closure	
Site manager review date	
Site manager signature to confirm no further action required	

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