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Dust Assessment Methodology

The Yorkshire and Humber (CCS Cross Country Pipeline) Development Consent Order

Under Regulation 5(2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Application Reference: EN070001

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Contents

1. Dust Assessment Methodology

1.0.1 The potential dust effects associated with the construction and decommissioning phases of the Onshore Scheme have been qualitatively assessed with reference to the IAQM 'Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance' (Ref 12.1).

1.0.2 According to the IAQM guidance (Ref 12.1) activities that can occur during the construction phase of the Onshore Scheme are classified into four parts to reflect their different potential effects:

- Earthworks;
- Construction works;
- Track out (The transportation of dust and dirt from the construction site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network); and
- Demolition works.

1.0.3 The IAQM describes a four step approach to determining the potential risk of dust effects occurring, appropriate mitigation measures and the significance of the residual effects.

1.0.4 The following methodology describes Step 2: Assess the risk of dust effects. Determining the risk of dust effects occurring was undertaken for each activity for each element of the Onshore Scheme, where relevant.

1.1 EARTHWORKS DURING CONSTRUCTION PHASE

Pipeline Envelope

1.1.1 During the earthworks the following activities would be undertaken within the spread, as appropriate:

- Working width preparation;
- Fencing;
- Preconstruction Drainage;
- Topsoil Strip;
- Blasting;
- Pipe stringing;

- Field bending;
- Welding and inspection;
- Non destructive welding testing;
- Joint coating;
- Trench excavation;
- Lower and Lay;
- Backfill;
- Pipeline tie-ins;
- Re-grading of soil
- Post construction drainage;
- Reinstatement of topsoil; and
- Reinstatement of boundaries/ removal of working width fencing.

1.1.2 Several Pipeline laying techniques were proposed, each requiring a different level of excavation works. Details of the techniques are provided in the Chapter 3 Onshore Scheme Description (Document 6.3). The majority of the Pipeline would be laid using an open cut technique which is considered to result in the largest dust effects during the earthworks.

1.1.3 It is estimated that the construction of the Pipeline would progress at approximately 1 km per day for each crew; although the rate of progress would be dependent on the ground and local conditions.

1.1.4 As discussed in Chapter 3 Onshore Scheme Description (Document 6.3), open cut crossing techniques would be used at all crossings with the exception of main rivers, railways and the landfall where a trenchless crossing technique is necessary. Trenchless crossing techniques include horizontal directional drill (HDD) and direct pipe, both of which are non-vertical, non open cut drilling techniques. As these are non open cut techniques the area of dust generation and therefore potential dust effects will be restricted to the pit areas where the Pipeline enters and exits the ground.

1.1.5 Other vertical non open cut techniques include micro tunnelling, grundoram and auger bore. Similarly to above, these are non-open cut techniques and therefore the area of dust generation and potential dust effects will be restricted. For all these processes excavation work is required to create exit and drive shafts/pits and therefore these techniques have a greater dust generating potential than HDD and direct pipe techniques.

1.1.6 Works at water crossings would take longer, with the required works to cross the River Ouse anticipated to last for 2-3 months with a non open cut

technique and 2 months to cross the River Hull headwaters using a non open cut technique.

1.1.7 For the purpose of this assessment, apart from where a trenchless crossing technique has been committed, a worst case approach was assumed whereby the open cut technique is applied throughout the Pipeline Envelope.

Temporary Construction Areas

1.1.8 Temporary Construction Areas (TCAs) will be located along the Pipeline Envelope and used for the storage of soil and other materials and for stringing pipes for installation using HDD, auger bore or micro tunnel. At TCAs the topsoil will be stripped before they are used and on completion of the work they would be ripped and soil restored. Definitions of these processes are provided in the Glossary (Document 6.19), with further details provided in Chapter 3 Onshore Scheme Description (Document 6.3). These processes will generate dust and therefore potential dust effects may occur during earthworks associated with TCAs.

Construction Compounds

1.1.9 Two Construction Compounds are proposed; Tollingham and Driffield Barracks. Earthworks associated with the Construction Compounds will primarily involve pre-construction drainage, soil stripping and then returned to previous use following construction. The exception to this is Driffield Barracks which will be hard standing. Due to the process proposed at the Construction Compounds, dust may be generated during earthworks.

AGIs

1.1.10 Earthworks would be required at the AGI sites to prepare the site for construction works. Earthworks will primarily involve excavating material, haulage, tipping and stockpiling.

1.1.11 Table 1 are examples of the potential dust emission classes applied to the assessment. Factors such as seasonality, duration and scale were also taken into consideration, where possible.

Table 1: Potential Earthworks Dust Emission Class Criteria	
Potential Dust Emission Classes	**Criteria**
Large	• Total site area: > 10,000 m^2 • Potentially dusty soil type (e.g. clay) • > 10 heavy earth moving vehicle active at any one time • Formation of bunds > 8 m in height • Total material moved > 100,000 tonnes
Medium	• Total site area: 2,500 - 10,000 m^2 • Moderately dusty soil type (e.g. silt) • 5 -10 heavy earth moving vehicle active at any one time • Formation of bunds 4 - 8 m in height • Total material moved 20,000 – 100,000 tonnes
Small	• Total site area: < 2,500 m^2 • Soil type with large grain size (e.g. sand) • < 5 heavy earth moving vehicle active at any one time • Formation of bunds < 4 m in height • Total material moved < 20,000 tonnes • Earthworks during wetter months

1.1.12 With reference to the derived dust emission class (Table 1) and distance between the nearest sensitive receptor and the Pipeline Envelope or Application Boundary (when assessing the potential dust effects associated with the TCAs, Construction Compounds and AGIs), identified in STEP 1; the criteria in Table 2 was used to determine the risk category from earthworks activity with no mitigation applied.

Table 2: Risk Category from Earthworks Activities with No Mitigation Measures				
Distance to Nearest Receptor (m)		**Dust Emission Class**		
Dust Soiling and PM_{10} [A]	**Ecological**	**Large**	**Medium**	**Small**
< 20	-	High Risk Site	High Risk Site	Medium Risk Site
20 – 50	-	High Risk Site	Medium Risk Site	Low Risk Site
50 – 100	<20	Medium Risk Site	Medium Risk Site	Low Risk Site
100 – 200	20 – 40	Medium Risk Site	Low Risk Site	Negligible
200 - 350	40 – 100	Low Risk Site	Low Risk Site	Negligible

Note: [A] human exposure, representing dust annoyance due to deposition or health effects due to fine dust fractions

1.1.13 Earthwork activity would be necessary for the Pipeline, TCAs, Construction Compounds and AGIs and therefore, where appropriate, a cumulative assessment of potential dust effects was undertaken.

1.2 CONSTRUCTION WORK DURING CONSTRUCTION PHASE

Pipeline Envelope

1.2.1 No construction works are associated with the Pipeline Envelope.

Temporary Construction Areas

1.2.2 No construction works are associated with the TCAs.

Construction Compounds

1.2.3 No construction works are associated with the construction compounds.

AGIs

1.2.4 The key issues when determining the potential dust emission class during construction works of the AGIs includes the size of the building(s)/infrastructure, method of construction, construction materials and duration of the build is also taken into consideration. Further details are provided in Chapter 3 Onshore Scheme Description (Document 6.3).

1.2.5 Table 3 provides examples of the potential dust emission classes. Factors such as seasonality, building type, duration and scale were also taken into consideration, where possible.

Table 3: Potential Construction Works Dust Emission Class Criteria

Potential Dust Emission Classes	Criteria
Large	• Total building volume > 100,000m^3 • Piling, on site concrete batching, sandblasting
Medium	• Total building volume 25,000 – 100,000m^3 • Potentially dusty construction material (e.g. concrete) • Piling, on-site concrete batching
Small	• Total building volume < 25,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)

1.2.6 With reference to the derived dust emission class (Table 3) and distance between the nearest sensitive receptor and the application boundary of the

AGI, identified in STEP 1; the criteria in Table 4 was followed to determine the risk category from construction activity with no mitigation applied.

Table 4: Risk Category from Construction Activities with no Mitigation Measures

Distance to Nearest Receptor (m)		Dust Emission Class		
Dust Soiling and PM_{10} [A]	Ecological	Large	Medium	Small
< 20	-	High Risk Site	High Risk Site	Medium Risk Site
20 – 50	-	High Risk Site	Medium Risk Site	Low Risk Site
50 – 100	< 20	Medium Risk Site	Medium Risk Site	Low Risk Site
100 – 200	20 – 40	Medium Risk Site	Low Risk Site	Negligible
200 - 350	40 - 100	Low Risk Site	Low Risk Site	Negligible

Note: [A] human exposure, representing dust annoyance due to deposition or health effects due to fine dust fractions

1.3 TRACK OUT WORKS DURING CONSTRUCTION PHASE

1.3.1 Track out is the transport of dust and dirt from the site onto the public road network, where it may be deposited and then re-suspended by vehicles using the local road network during the construction phase. Factors such as vehicle size, speed, numbers, geology and duration were also taken into consideration, where possible.

1.3.2 Table 5 provides examples of the potential dust emission classes.

Table 5: Potential Track Out Dust Emission Class Criteria

Potential Dust Emission Classes	Criteria
Large	• 100 HGV (> 3.5t) trips in any one day • Potentially dusty surface material • Unpaved road length > 100 m
Medium	• 25 – 100 HGV (> 3.5t) trips in any one day • Moderately dusty surface material • Unpaved road length 50 – 100 m
Small	• < 25HGV (>3.5t) trips in any one day • Surface material with low potential for dust release • Unpaved road length < 50m

1.3.3 With reference to the derived dust emission class (Table 5) and distance to sensitive receptors identified in STEP 1, the criteria in Table 6 was used to determine the risk category from track-out activity with no mitigation applied.

Table 6: Risk Category from Track Out Activities with no Mitigation Measures

Distance to Nearest Receptor (m)		Dust Emission Class		
Dust Soiling and PM_{10} [A]	Ecological	Large	Medium	Small
< 20	-	High Risk Site	Medium Risk Site	Medium Risk Site
20 – 50	< 20	Medium Risk Site	Medium Risk Site	Low Risk Site
50 – 100	20 – 100	Low Risk Site	Low Risk Site	Negligible

Note: [A] human exposure, representing dust annoyance due to deposition or health effects due to fine dust fractions

1.3.4 Track out would occur during the construction phase of the Onshore Scheme. Track out considers all vehicle movements associated with the earthworks required for the Pipeline, TCAs, Construction Compounds and AGIs as well as the construction works associated with the AGIs. The traffic data does not distinguish between vehicle movements associated with earthworks and construction works. Therefore a cumulative approach was taken and track out associated with all elements of the construction phase of the Onshore Scheme was considered. This approach is in accordance with the IAQM Guidance (Ref 12.1).

1.3.5 Track out would also occur during the decommissioning phase.

1.4 DEMOLITION

1.4.1 Demolition works would be undertaken during the decommissioning phase only. Demolition of the AGIs only will be undertaken. The duration of the decommission works associated with the AGIs is anticipated to be similar to the duration of the construction works (refer to Chapter 3 Onshore Scheme Description (Document 6.3)).

1.4.2 Table 7 provides examples of the potential demolition dust emission classes, although factors such as seasonality, building type, duration and scale were also taken into consideration, where possible.

Table 7: Potential Demolition Dust Emission Class Criteria	
Potential Dust Emission Classes	**Criteria**
Large	• Total Building Area: > 50,000 m^2 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities: > 20 m above ground level
Medium	• Total Building Area: 20,000 - 50,000 m^2 • Potentially dusty construction material • Demolition activities: 10 - 20 m above ground level
Small	• Total Building Area: < 20,000 m^2 • construction material with low potential for dust release • Demolition activities: < 10 m above ground level, • Demolition occurring in wetter months

1.4.3 With reference to the derived dust emission class (Table 7) and distance between the nearest sensitive receptor and Application Boundary of the AGIs identified in STEP 1; the criteria in Table 8 was used to determine the risk category from demolition activity with no mitigation applied.

Table 8: Risk Category from Demolition Activities with No Mitigation Measures				
Distance to Nearest Receptor (m)		**Dust Emission Class**		
Dust Soiling and PM_{10} [A]	**Ecological**	**Large**	**Medium**	**Small**
< 20	-	High Risk Site	High Risk Site	Medium Risk Site
20 – 100	<20	High Risk Site	Medium Risk Site	Low Risk Site
100 – 200	20 – 40	Medium Risk Site	Low Risk Site	Low Risk Site
200 – 350	40 – 100	Medium Risk Site	Low Risk Site	Negligible

Note: [A] human exposure, representing dust annoyance due to deposition or health effects due to fine dust fractions