APPENDIX 2

STABILITY ANALYSES – BASAL ARTIFICIAL GEOLOGICAL BARRIER

1. BASAL ARTIFICIAL GEOLOGICAL BARRIER MODEL

A basal artificial geological barrier will be constructed on a phased basis across the floor of the western excavation area, as has been constructed within the currently permitted existing inert landfill area. The artificial geological barrier constructed within the western excavation area will comprise a compacted layer of suitable indigenous quarry waste (overburden and interburden) and/or suitable imported inert waste material and will have a minimum thickness of 1.0m and a permeability no greater than 1 x 10^{-7}m/s.

The basal AGB will be constructed in accordance with a Construction Quality Assurance Plan approved by the Environment Agency.

2. BASAL SUB-GRADE

- **Basal Sub-Grade Stability**

  Based on evidence from geotechnical site inspection, site investigation borehole logs and published information relating to the lithological character of the strata sequence it is considered that no compressible material or cavities will be present beneath the western extension area. Accordingly, it is considered that the stability and integrity of the basal sub-grade will not be compromised by compressibility or the presence of cavities.

- **Basal Heave**

  Excavation dewatering is undertaken in order to permit mineral extraction, construction of the basal and side slopes artificial geological barrier and backfilling of the quarry void in dry conditions. The quarry, including the western quarry excavation area, will continue to be operated in the same manner. There will be no groundwater pressures acting which have the potential to promote basal heave. Accordingly, it is considered that the stability and integrity of the basal sub-grade will not be compromised by basal heave.

3. SLOPE STABILITY

- **Aim**

  To assess the potential for instability of the basal AGB involving instability of the side slopes AGB or the waste mass.

- **Analytical approach**

  Use of SLIDE computer software to investigate the potential for slope failure.

- **Slope geometry**

  See Analysis A.

- **Analysis input parameters**
  - Shear strength and bulk density parameters

Material Type	**Drained Shear Strength [c' (kPA)]**	**Angle of Shearing Resistance (°)**	**Bulk Density (Mg/m³)**
Artificial Geological Barrier (AGB)	4	23	1.8
Waste Mass	4	23	1.8
Groundwater	Quarry Floor Level		
Leachate	None		

- **Results**

Slope Instability involving Side Slope and Basal Artificial Geological Barriers (Side Slopes/Basal AGB – Analysis A)

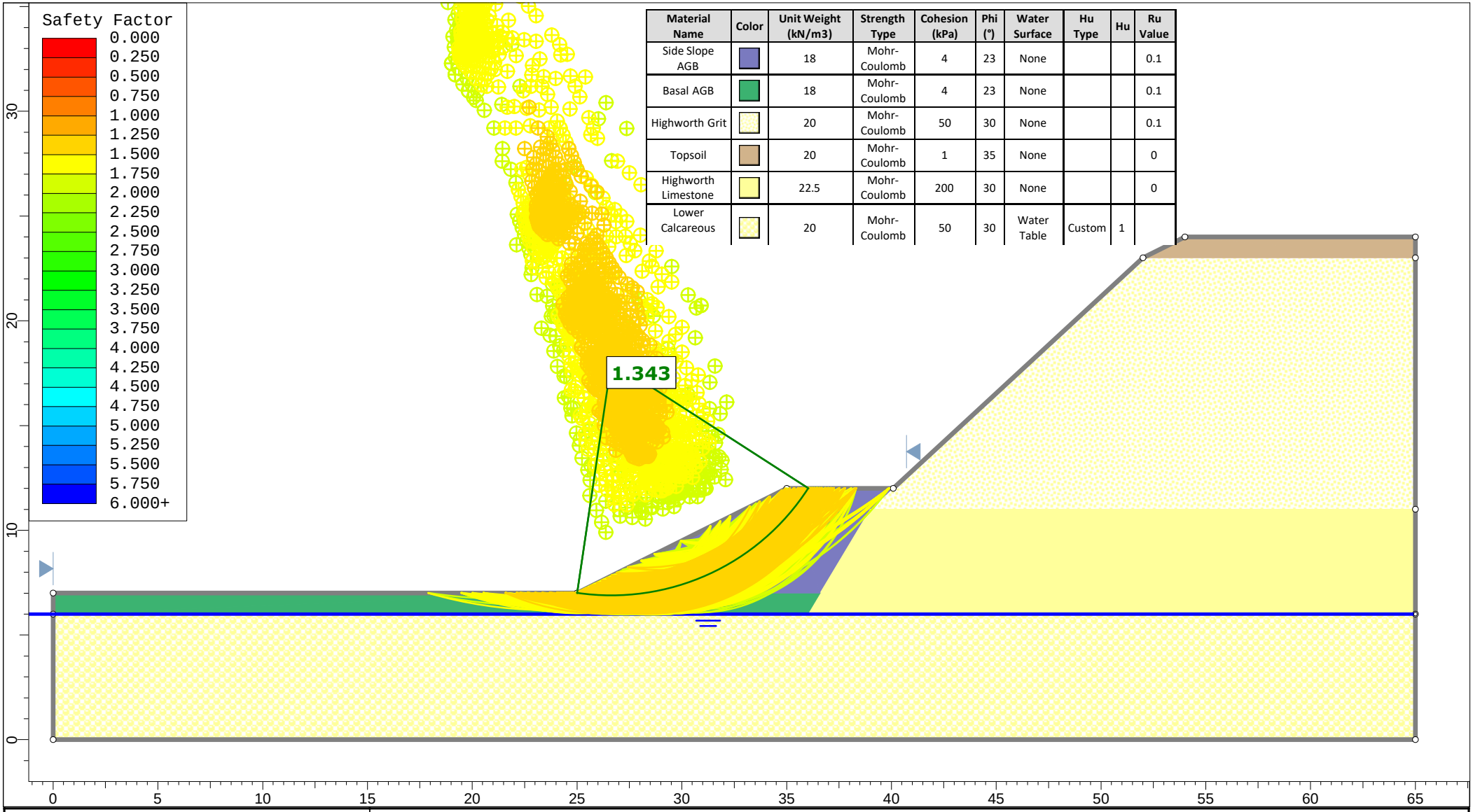
Using the input parameters detailed above, a minimum FoS value of 1.34 is indicated by the analysis results for a circular slope failure involving the side slopes and basal AGBs.

Slope Instability involving Waste Mass and Basal Artificial Geological Barrier (Waste Mass Stability/Basal AGB – Analysis A)

Using the input parameters detailed above, a minimum FoS value of 1.34 is indicated by the analysis results for a circular slope failure involving the waste mass and basal AGB.

4. CONCLUSIONS

The calculated FoS values of 1.34 are considered satisfactory. Accordingly, it is considered that the stability and integrity of the basal AGB will not be compromised by slope instability involving the side slopes AGB or the waste mass.



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Side Slope AGB		18	Mohr-Coulomb	4	23	None			0.1
Basal AGB		18	Mohr-Coulomb	4	23	None			0.1
Highworth Grit		20	Mohr-Coulomb	50	30	None			0.1
Topsoil		20	Mohr-Coulomb	1	35	None			0
Highworth Limestone		22.5	Mohr-Coulomb	200	30	None			0
Lower Calcareous		20	Mohr-Coulomb	50	30	Water Table	Custom	1	

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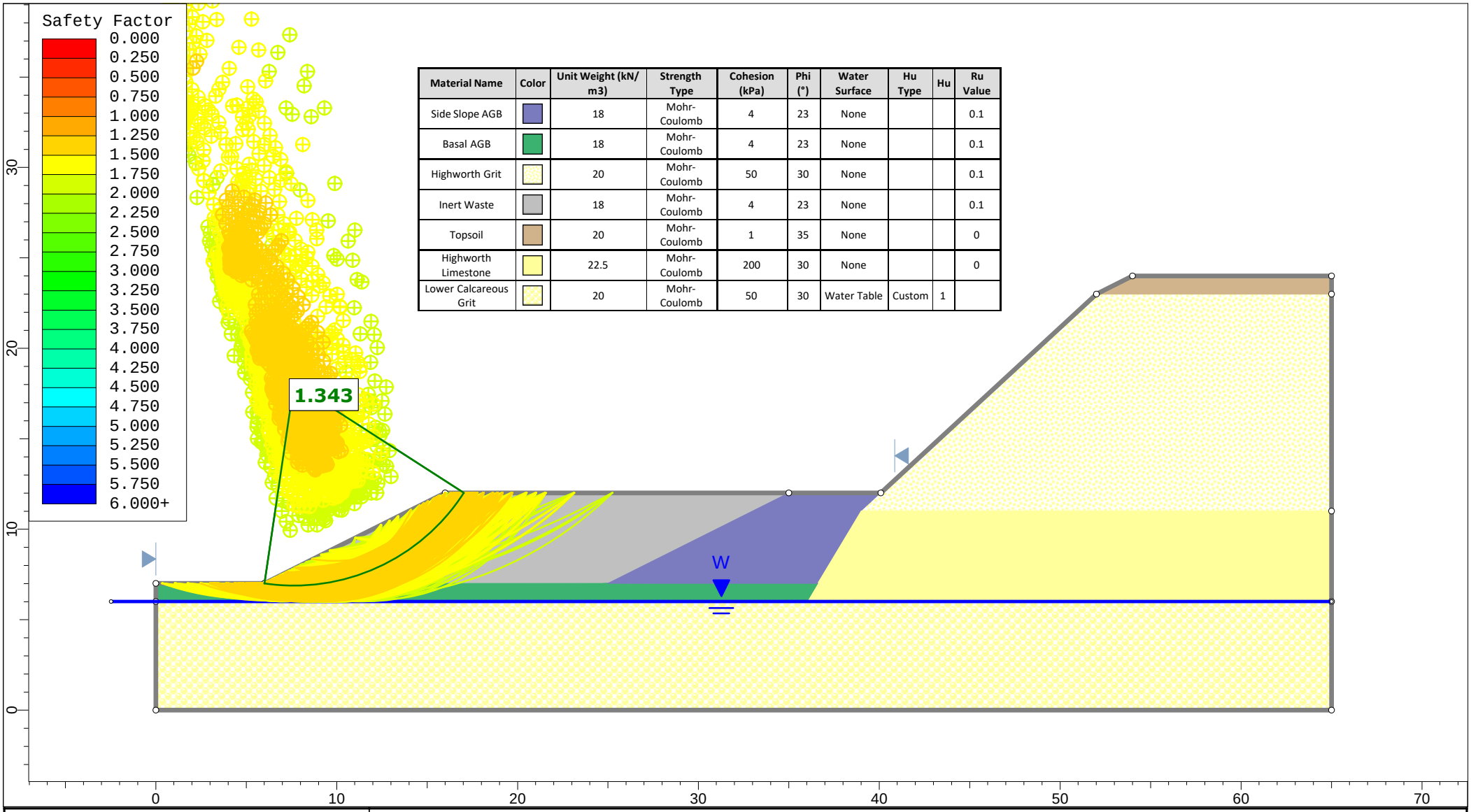
SLIDEINTERPRET 9.038

Project	Shellingford Quarry - Stability Risk Assessment		
Group	Side Slopes/Basal AGB - Analysis A	*Scenario*	Master Scenario
Drawn By	GWP Consultants LLP	*Company*	Multi-Agg Limited
Date	25/09/2025, 16:19:56	*File Name*	Shellingford Quarry SRA 2025.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type	Hu	Ru Value
Side Slope AGB		18	Mohr-Coulomb	4	23	None			0.1
Basal AGB		18	Mohr-Coulomb	4	23	None			0.1
Highworth Grit		20	Mohr-Coulomb	50	30	None			0.1
Inert Waste		18	Mohr-Coulomb	4	23	None			0.1
Topsoil		20	Mohr-Coulomb	1	35	None			0
Highworth Limestone		22.5	Mohr-Coulomb	200	30	None			0
Lower Calcareous Grit		20	Mohr-Coulomb	50	30	Water Table	Custom	1	

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Project	Shellingford Quarry - Stability Risk Assessment		
Group	Waste Mass Stability/Basal AGB - Analysis A	*Scenario*	Master Scenario
Drawn By	GWP Consultants LLP	*Company*	Multi-Agg Limited
Date	25/09/2025, 16:19:56	*File Name*	Shellingford Quarry SRA 2025.slmd