

Managing Historic Mine & Quarry Tip Risk

Staffordshire County Council & Amey

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MHA+ PSP4 Lunch and Learns

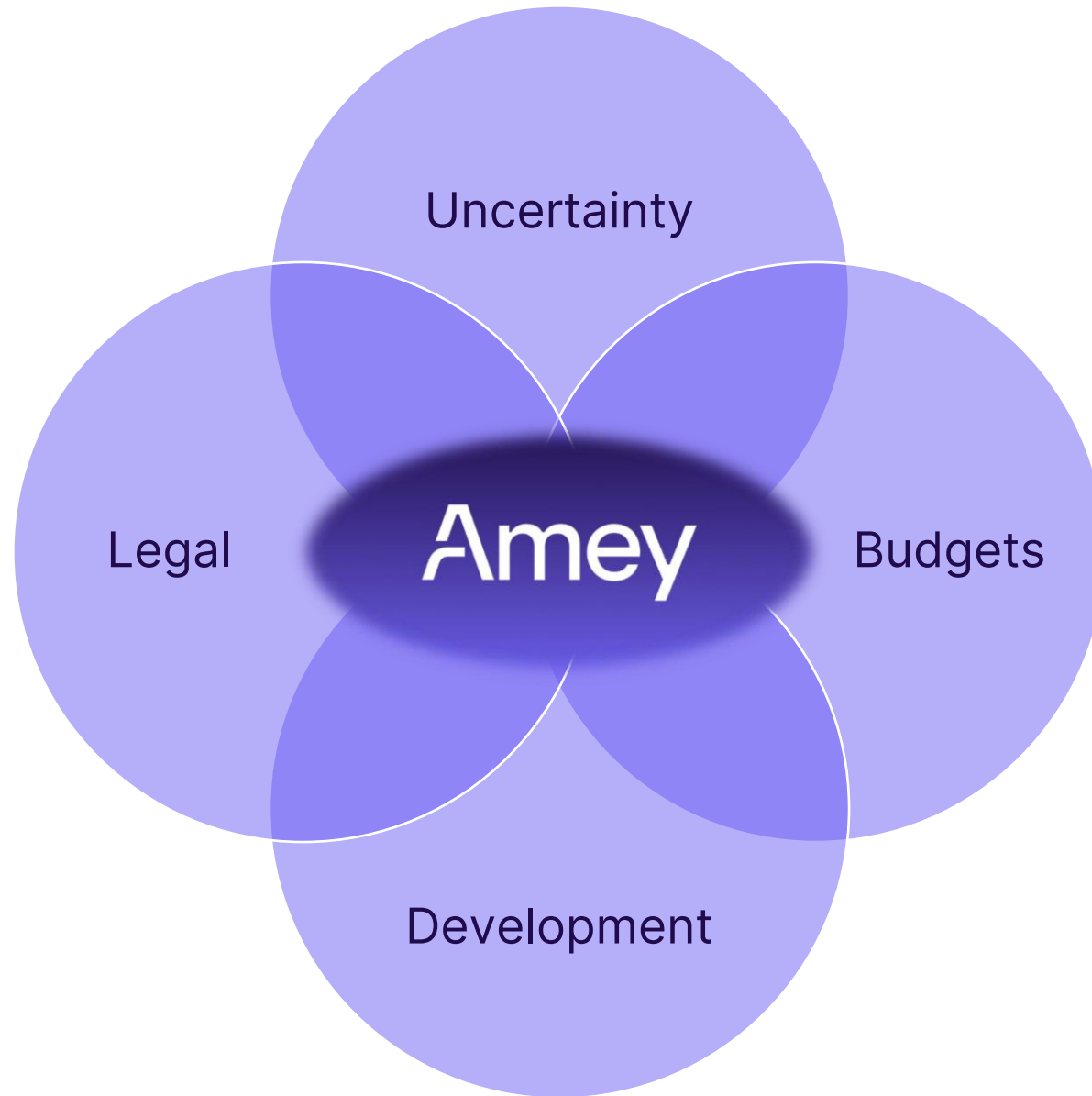
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Life's better connected

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Why Mine & Quarry Tip Risk Matters



Historical Legacy

- Thousands of sites across the UK
- Many have been modified or redeveloped



Risk

- Weathering
- Erosion
- Climate Change
- Development Pressure
- Drainage



Consequences

- Public Safety
- Property Damage
- Infrastructure Disruption
- Environmental Impacts
- Reputational Damage

Risk is rarely static

Legislation

Mines and Quarries (Tips) Act 1969 & Mines and Quarries (Tips) Regulations 1971

The Act establishes requirements for:

- Identification of tips
- Inspection and monitoring
- Assessment of stability
- Risk-based management
- Protection of people and property

An Act to make further provision in relation to tips associated with mines and quarries ; to prevent disused tips constituting a danger to members of the public ; and for purposes connected with those matters.

[27th March 1969]

Amey's Objective

To provide Staffordshire County Council with:

- Evidence-based understanding of tip assets
- Risk register and prioritisation
- Proportionate inspection regime
- Defensible decision-making framework

Staffordshire's Objective

- Maintain a register of known tips.
- Undertake periodic inspections.
- Categorise tips according to risk.
- Monitor high-risk sites.
- Commission geotechnical assessments where necessary.
- Develop emergency response procedures.
- Secure funding for remediation of higher-risk sites.



The Challenge in Staffordshire

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Scale of the Assets

- 2,600km² area
- Over 730 historic sites catalogued
- Over 130 sites visually assessed
- Multiple land uses:
 - ✓ Woodland
 - ✓ Residential
 - ✓ Industrial
 - ✓ Agricultural
 - ✓ Public open spaces
 - ✓ Transport corridors

Amey's Methodology Overview

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Stage 1 – Systematic Site Identification

Over the entire County:

- 10km x 10km OS grid framework
- Historic mapping
- Mining records
- Quarry records
- Aerial imagery
- Street level imagery
- Client records

A repeatable and auditable process that ensures no area is overlooked.



Stage 2 – Site Cataloguing

Each site captured:

- Location
- Historic operation
- Site size
- Current land use
- Potential spoil presence
- Development constraints

Benefits:

- Single source of truth
- Consistent dataset
- Supports future inspection planning



Stage 3 – Enhanced Desk Studies

Desktop Assessment Tools

- Historic maps
- LiDAR
- Aerial photography
- Street View
- Topographic analysis
- Development history

Annual Planning Reviews

Risk can change due to:

- Housing schemes
- Industrial redevelopment
- Infrastructure projects

Purpose

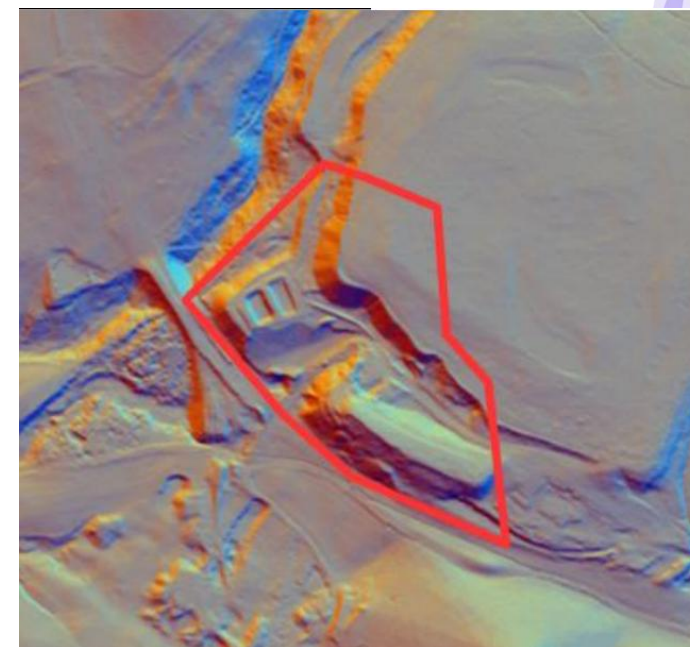
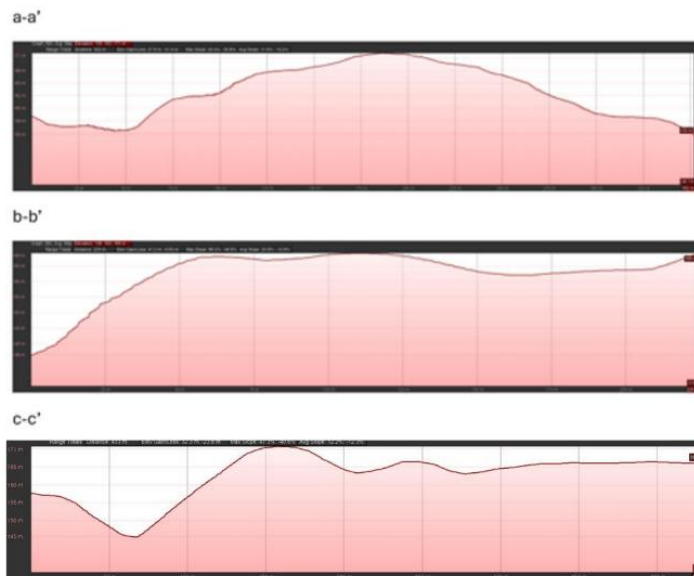
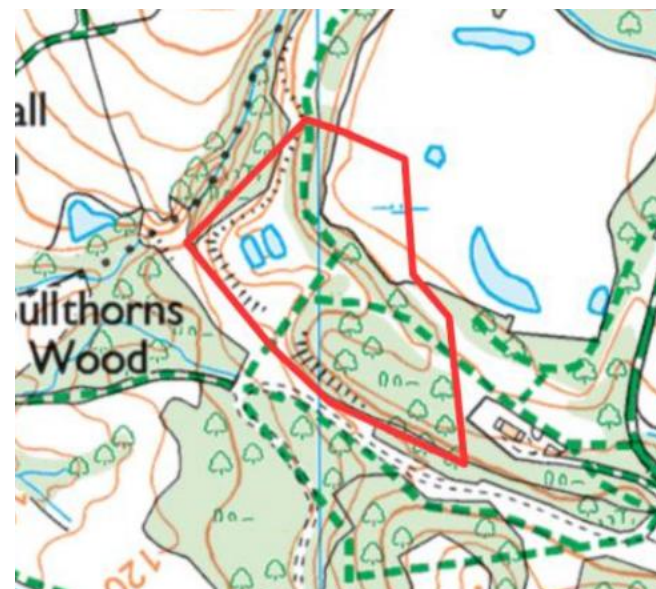
Determine:

- Is spoil still present?
- What receptors exist?
- Is field inspection required?



Desktop evidence focuses inspections where they add most value

Stage 3 – Enhanced Desk Studies





Site Inspections

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Field Investigations

Assessment includes:

- Slope geometry
- Vegetation cover
- Water and drainage
- Erosion
- Terracing
- Burrowing
- Historic stabilisation measures
- Evidence of instability

Outcome

- Verification of desktop assumptions.

Risk Assessment Framework

Inputs include:

- Magnitude of potential failure
- Presence of receptors
- Distance to receptor
- Slope condition
- Water influence

SCORE	RISK RATING					
1: Very low	Severity	Likelihood				
2: Low		1	2	3	4	5
3: Moderate	5	5	10	15	20	25
4: High	4	4	8	12	16	20
5: Very high	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5

RISK RATING	INSPECTION FREQUENCY	ADDITIONAL ACTIONS
Severe (17-25)	Development and implement action plan defining inspection frequency and mitigating actions.	
High (13-16)	6 Monthly	N/A
Medium (8-12)	1 year	N/A
Low (3-7)	5 years	Annual review of site on SCC planning portal if a site is deemed to have a significant potential to be developed on in the future.
Negligible (1-2)	Not required	

Risk Register Development

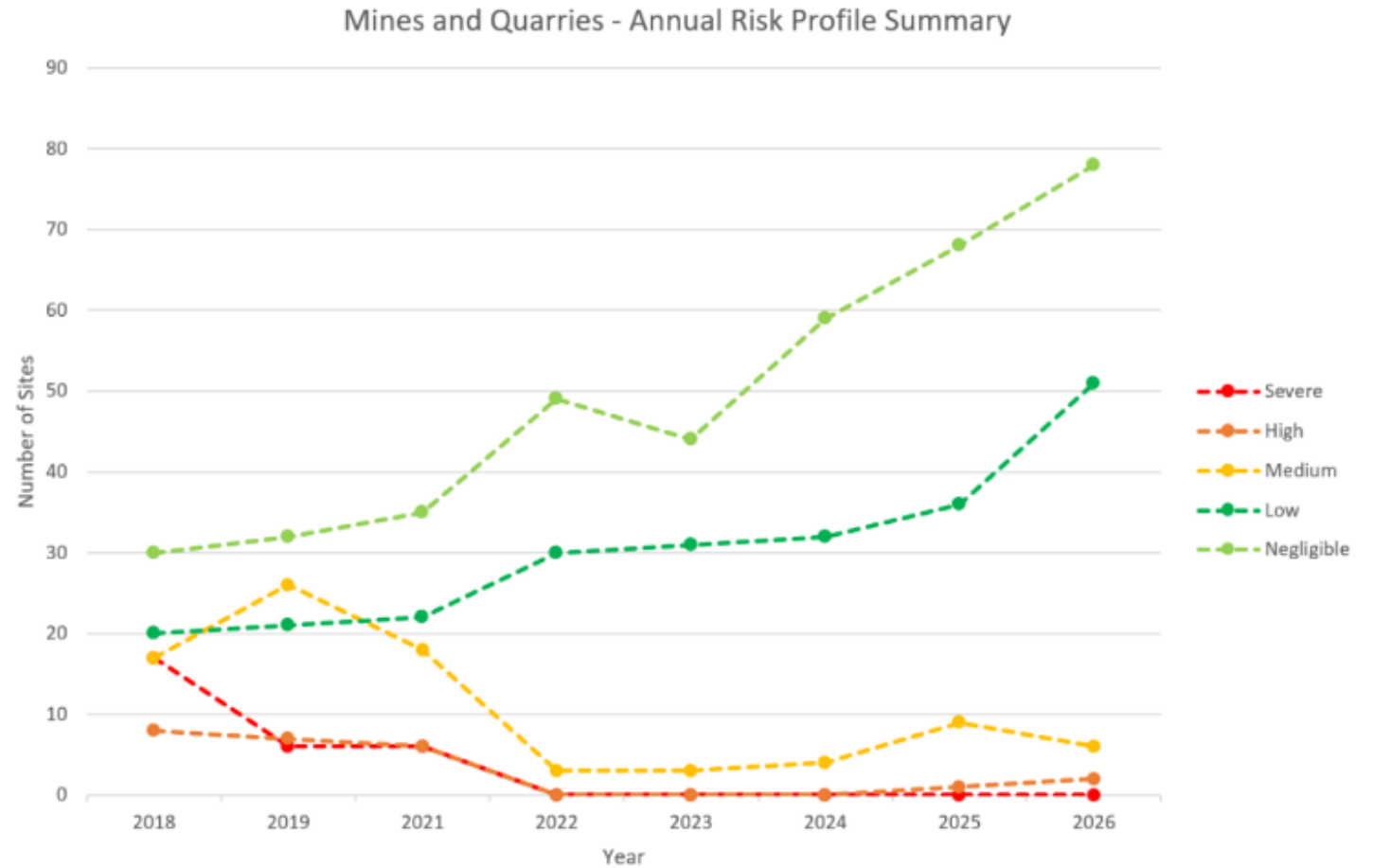
From Asset List to Managed Portfolio

The register records:

- Site details
- Current risk
- Inspection history
- Recommended actions
- Future inspection dates

Creates

- Governance
- Transparency
- Traceability





Why Important?

Residential development introduced new receptors.

Findings

- Slope modification observed.
- Retaining walls installed.
- New housing at slope toe.

Outcome

- Risk ranking elevated to High.

Value Added

- Early identification.
- Engagement with local planning authority.



Case Study 2

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Why Important

Live business adjacent to tip.

Findings

- Steep spoil slopes.
- Evidence of instability indicators.
- Commercial receptors nearby.

Outcome

- High-risk classification.

Actions

- Ownership investigation.
- Stakeholder engagement.
- Enhanced monitoring.



Case Study 3 – Sites Removed from Register

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Examples:

- Springfield Colliery
- Bunkers Hill Colliery

Inspection Outcome

- No spoil tip present.

Benefit

- Removing false positives.

Client Value

- Reduces unnecessary expenditure.
- Improves quality of asset records.
- Focuses budget on genuine risks.

Delivering the
Programme Safely

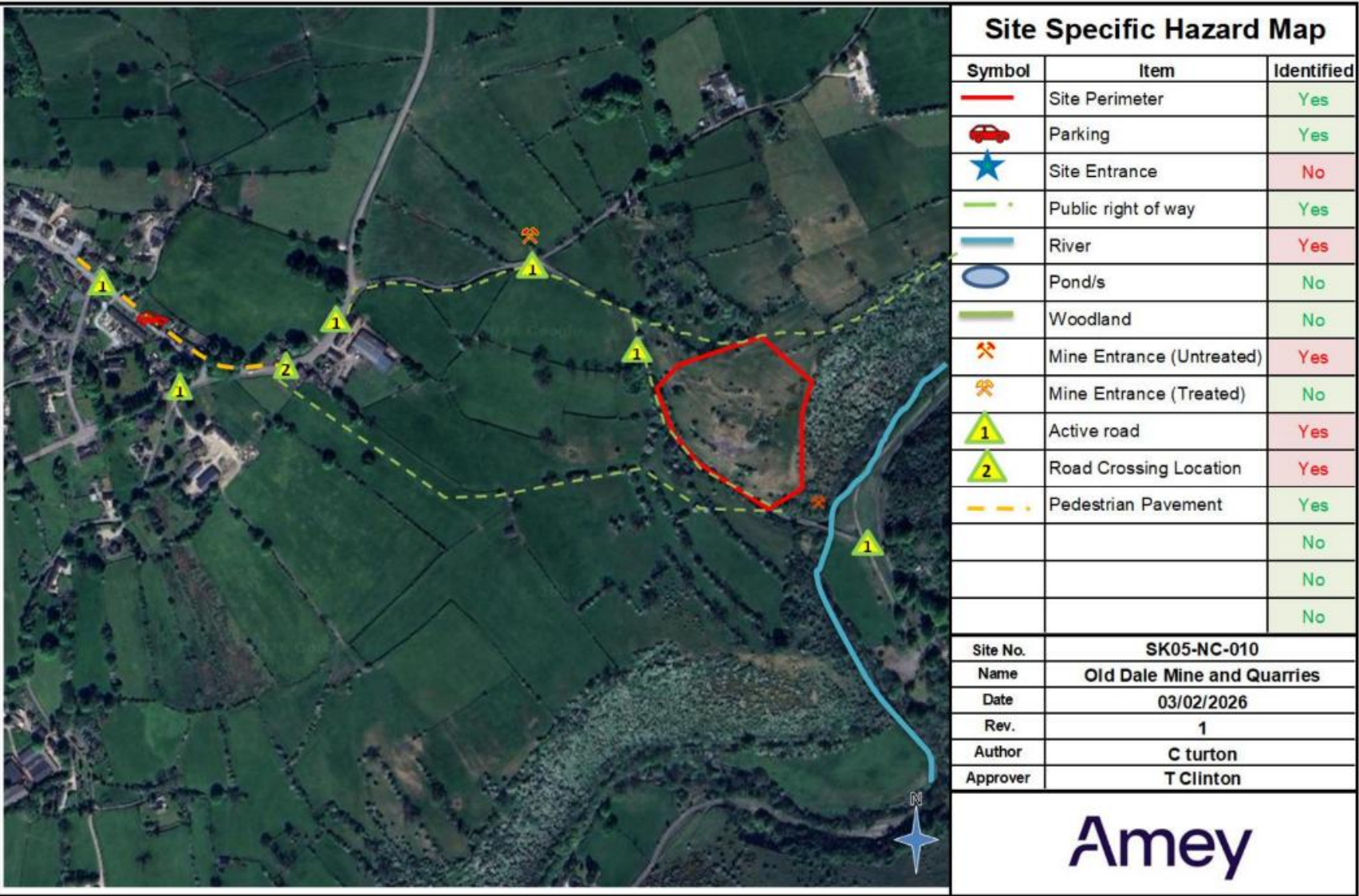
Health, Safety and Welfare First

All inspections undertaken by:

- Competent geotechnical engineers
- Two-person inspection teams
- Site-specific risk assessments
- Dynamic point-of-work assessments
- Approved Safe Systems of Work (SSoW)

Key Principle

- No site is inspected if it cannot be accessed safely.
- This principle has driven inspection planning throughout the Staffordshire programme.



Managing Access

Managing Access Challenges

Common Challenges Encountered

- Third-party land ownership
- Difficult terrain
- Dense vegetation
- Active industrial operations
- Recreational land uses
- Highway constraints

Amey Approach

1. Identify landowners.
2. Seek permissions.
3. Review access routes.
4. Undertake point-of-work assessment.
5. Adjust inspection scope if required.

Example

Mill Ridge initially could not be safely inspected due to active sport shooting. Amey revisited the site, engaged directly with landowners, gained permission and safely completed the inspection the following year.



Safe Working Produces Improve Risk Assessments

Why Safety and Quality are Linked

Safe inspections enable:

- ✓ Better observations
- ✓ More complete coverage
- ✓ Higher confidence in risk ratings
- ✓ Improved stakeholder engagement
- ✓ More defensible decisions



Safe Working Produces Improved Risk Assessments

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- Personal Highways Safety (PHS)
- ISAR3 – Cold Water Training
- CSCS MAP
- IOSH Working/Managing Safely



Pre-Site

- Desk Study
- Safe System of Work
- Briefing



On Site

- Site Briefing
- Point of Work Risk Assessment
- Public liaison letter
- Lessons Learnt

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Benefits Delivered to Staffordshire

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Strategic Benefits

- ✓ County-wide visibility
- ✓ Defensible compliance
- ✓ Prioritised inspections
- ✓ Better use of public funds
- ✓ Improved public safety
- ✓ Long-term asset intelligence

Operational Benefits

- ✓ Consistent methodology
- ✓ Strong Health and Safety Culture
- ✓ Live risk register
- ✓ Forward inspection programmes

Thank you

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