

DgS

Engineer: S.Ditton

Drawn: S.Ditton

Date: 10.08.11

Ditton Geotechnical
Services Pty Ltd

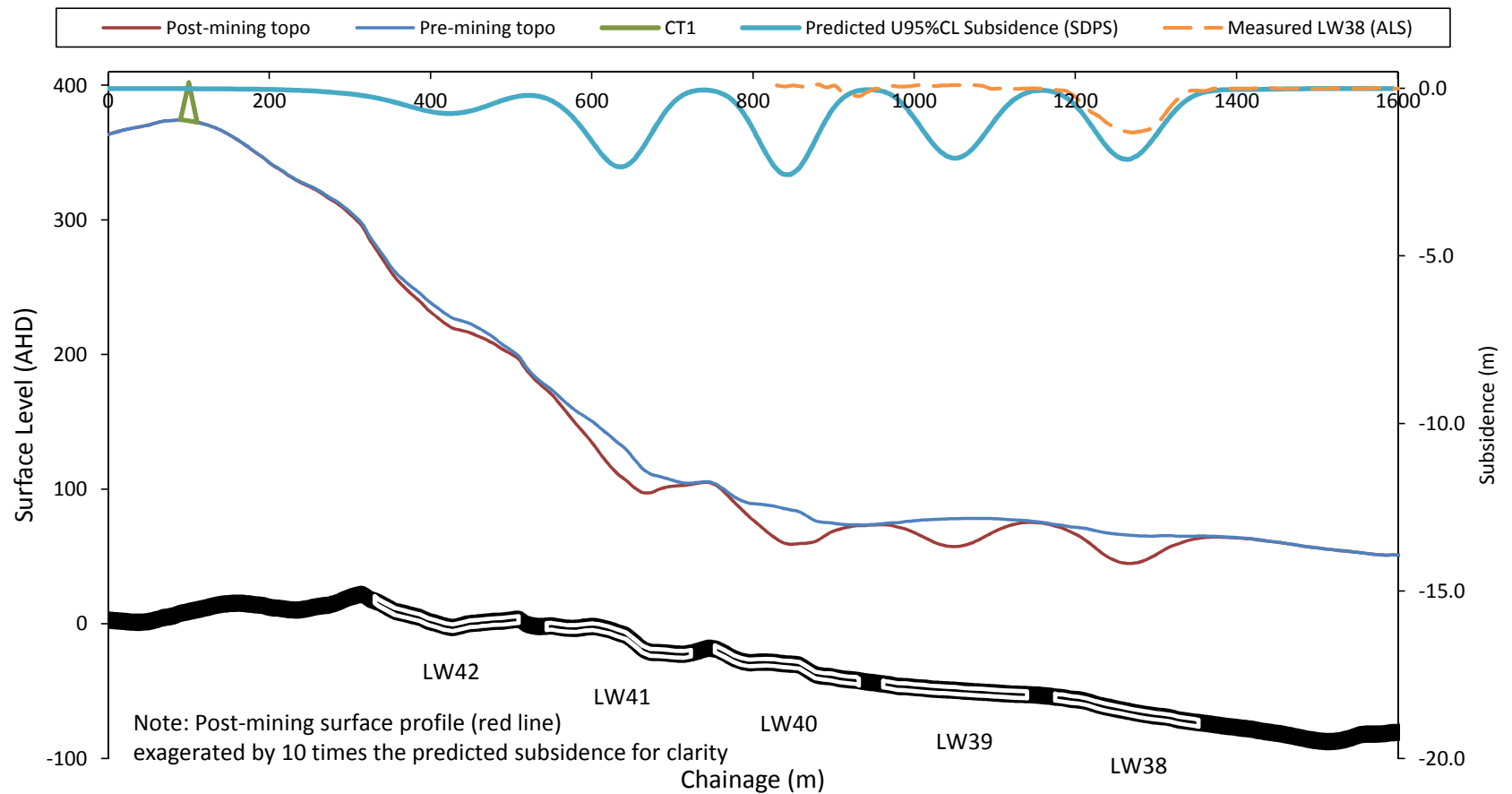
Client: West Wallsend Colliery
WWD-012/7

Title: Predicted Worst-Case Horizontal Strains Contours for Proposed
Longwall Layout beneath Steep Slopes and Cliff Lines in the
Western and Southern Domains

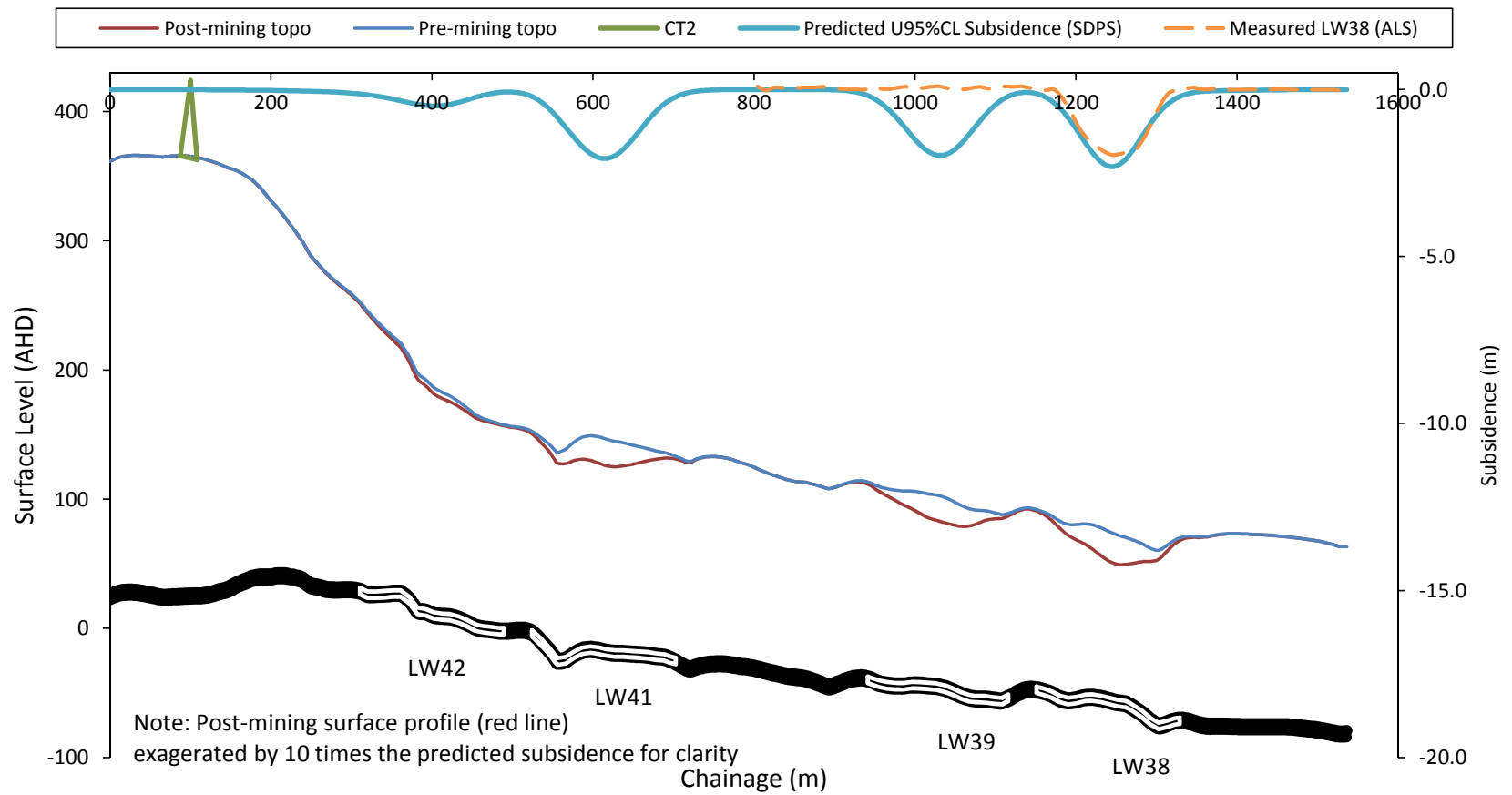
Scale: 1:25,000

Figure No:

8



Engineer:	S.Ditton	Client:	West Wallsend Colliery
Drawn:	S.Ditton		WWD-012/7
Date:	25.05.11	Title:	Predicted Pre and Post-Mining Surface Levels Along Mapped Section 12 through Gencom Tower CT1 after LWs 38 to 42
Ditton Geotechnical Services Pty Ltd		Scale:	NTS
		Figure No:	9a



Engineer:	S.Ditton	Client:	West Wallsend Colliery
Drawn:	S.Ditton		WWD-012/7
Date:	25.05.11	Title:	Predicted Pre and Post-Mining Surface Levels Along Mapped Section 11 through Gencom Tower CT2 after LWs 38 to 42
Ditton Geotechnical Services Pty Ltd		Scale:	NTS
		Figure No:	9b

Key:

H = Slope Height

b = distance crack behind crest

d = slope dip angle

a = bedding dip angle

X = Rock Wedge Basal Contact Length

W = Rock Wedge Weight

z = crack depth

z_w = water depth in crack

U_1 = Horizontal Water Pressure Force

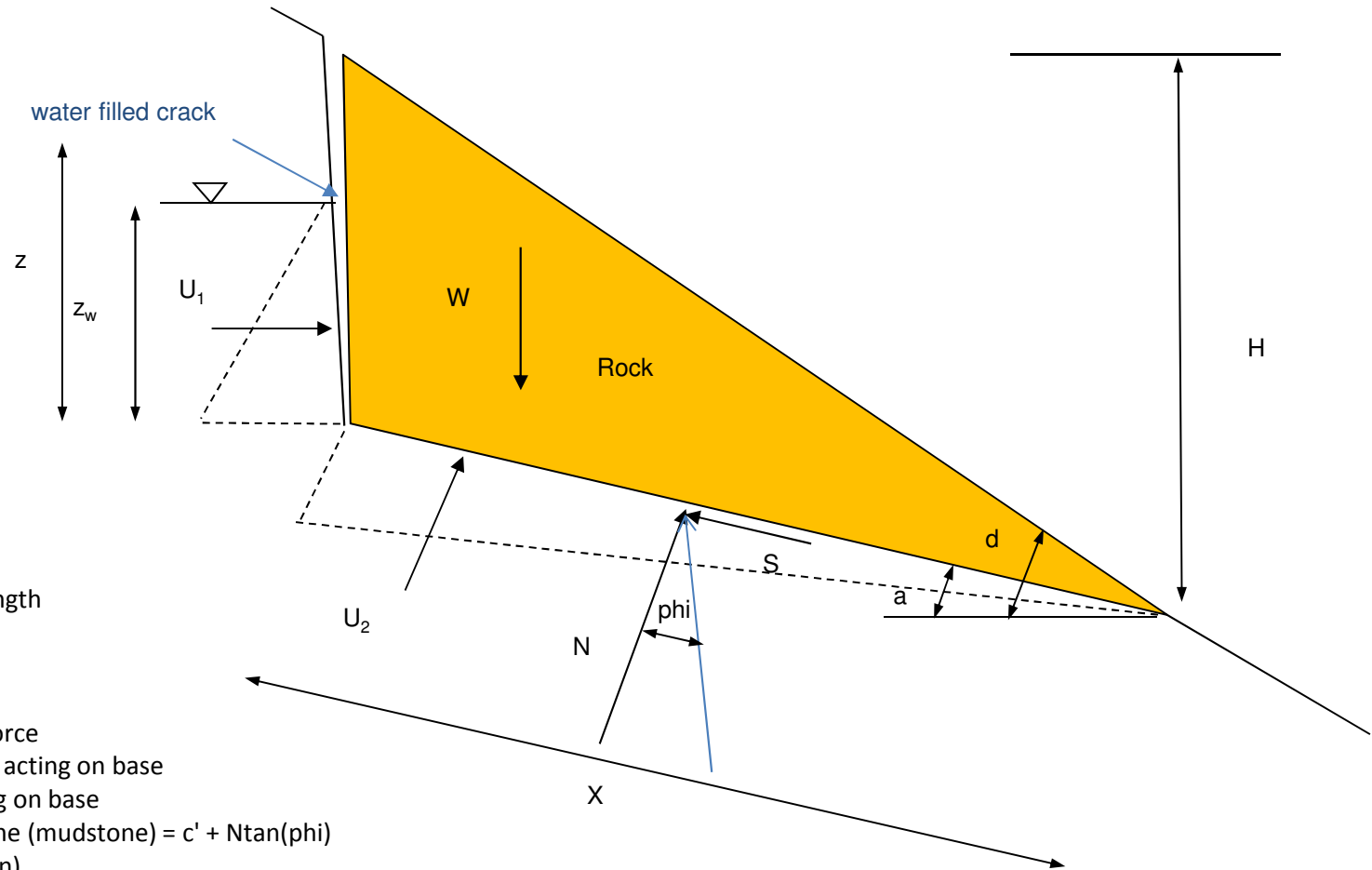
U_2 = Normal water pressure force acting on base

N = Normal resistance force acting on base

S = Shear Strength of bedding plane (mudstone) = $c' + N \tan(\phi)$

(see **Section 6.1** for FoS calculation)

Ref: Hoek, 2000



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Engineer: S.Ditton

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Date: 27.07.11

Ditton Geotechnical

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Client:

West Wallsend Colliery

WWD-012/7

Title:

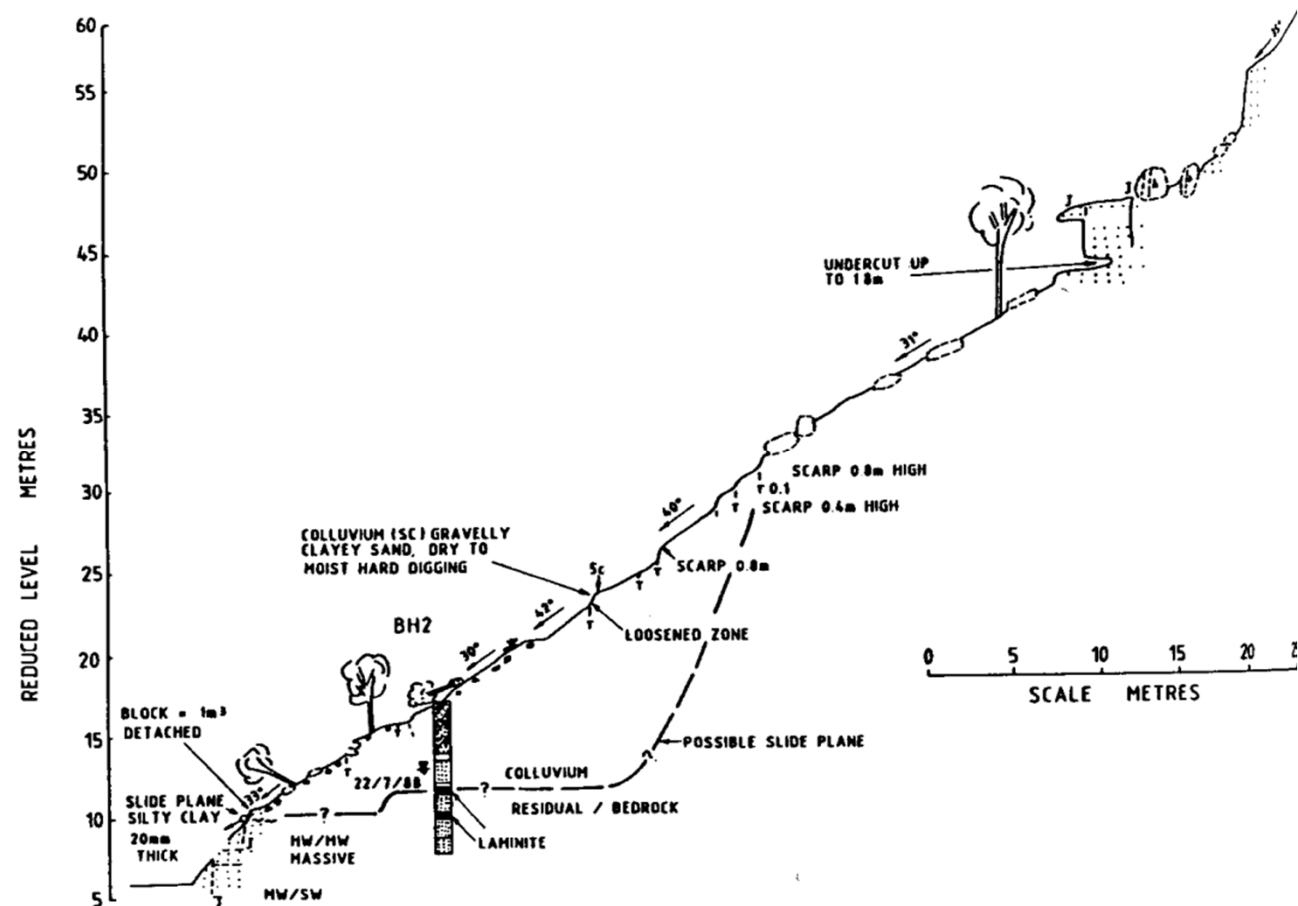
Force Balance Diagram for Assessing Deep-Seated Sliding Potential on Steep Slopes which have been Tilted and Cracked by Mine Subsidence

Scale:

NTS

Figure No:

10a



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Engineer: S.Ditton

Drawn: S.Ditton

Date: 25.05.11

Ditton Geotechnical

Services Pty Ltd

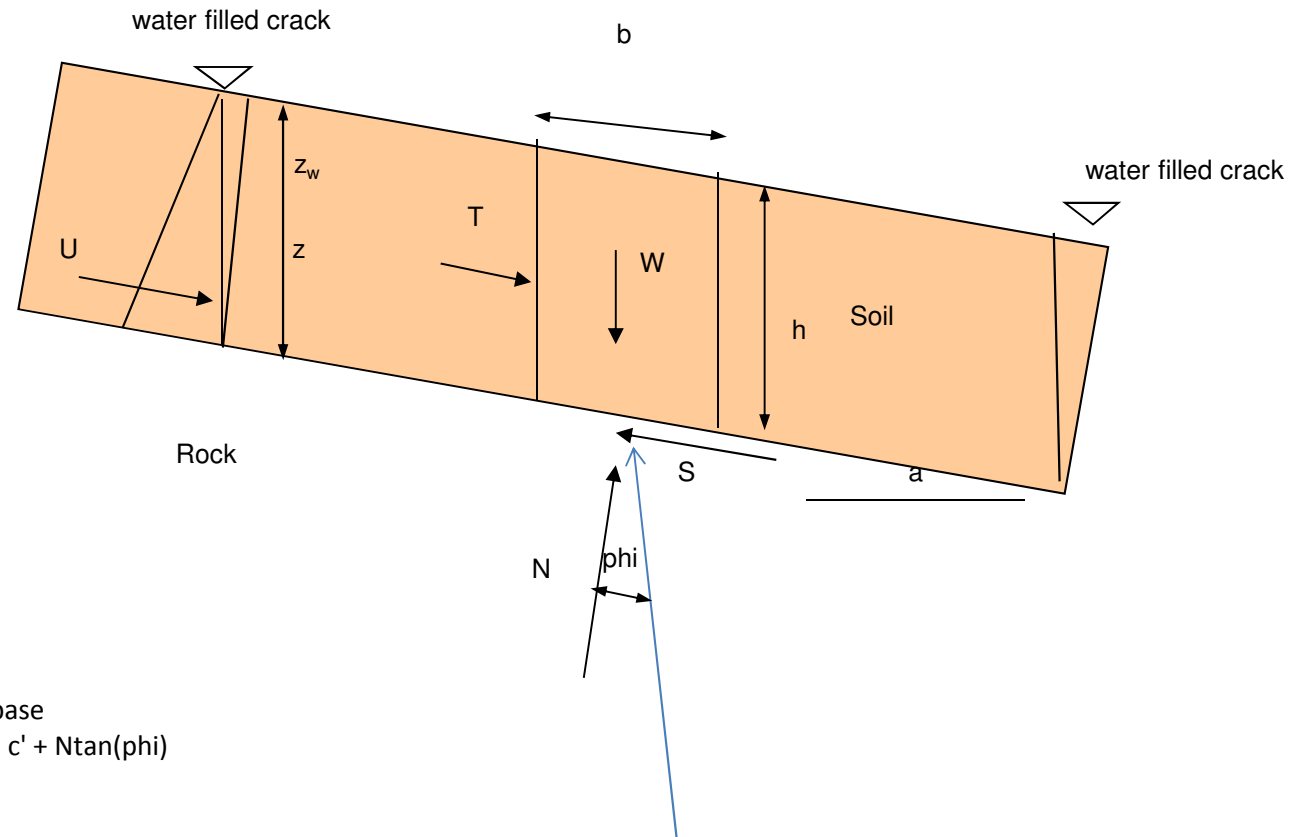
Client: West Wallsend Colliery

WWD-012/7

Title: Example of Steep Slope Instability in Clifton Sub Group Sandstones and Claystones

Scale: NTS

Figure No: 10b



Key:

H = Slope Height

a = slope dip angle (α)

X = Rock Wedge Basal Contact Length

W = Rock Wedge Weight

z = crack depth

z_w = water depth in crack

N = Normal resistance force acting on base

S = Shear Strength of soil/rock plane = $c' + N \tan(\phi)$
(see **Section 6.4** for FoS calculation)

Ref: Das, 1998

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Engineer: S.Ditton

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Date: 27.07.11

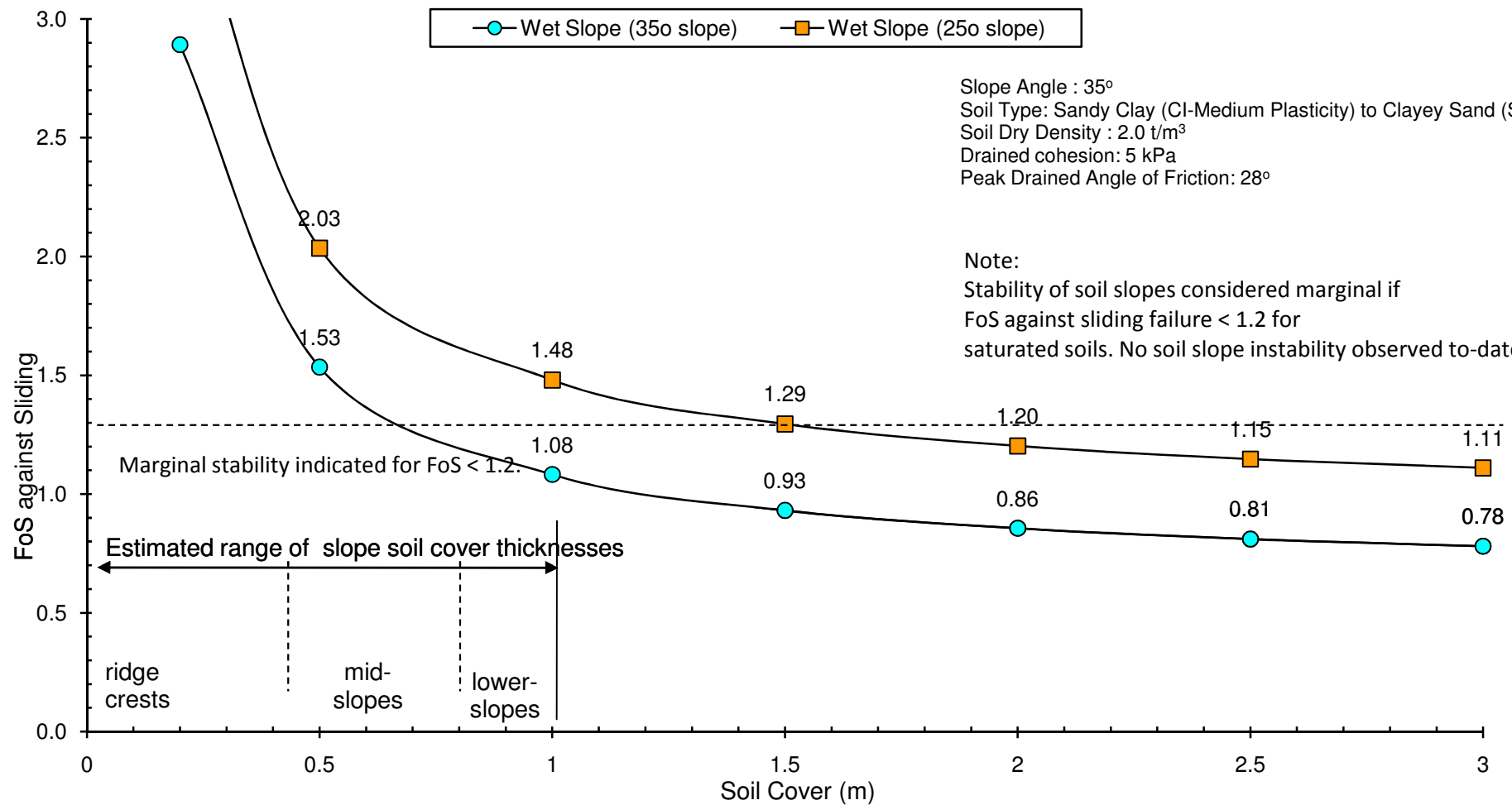
Ditton Geotechnical
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Client: West Wallsend Colliery
WWD-012/7

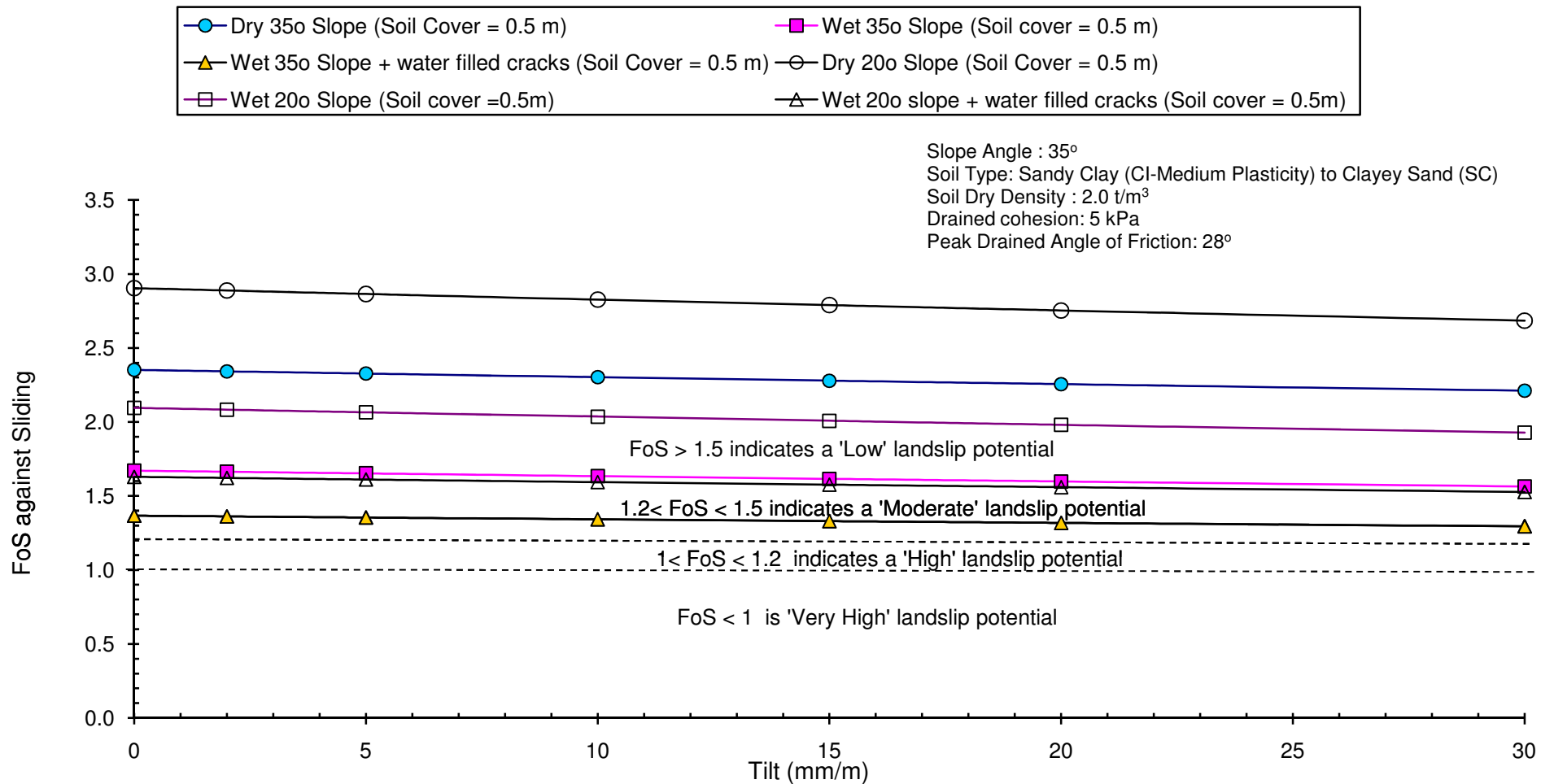
Title: Force Balance Diagram for Assessing Shallow Soil Sliding Potential on
Steep Slopes which have been Tilted and Cracked by Mine Subsidence

Scale: NTS

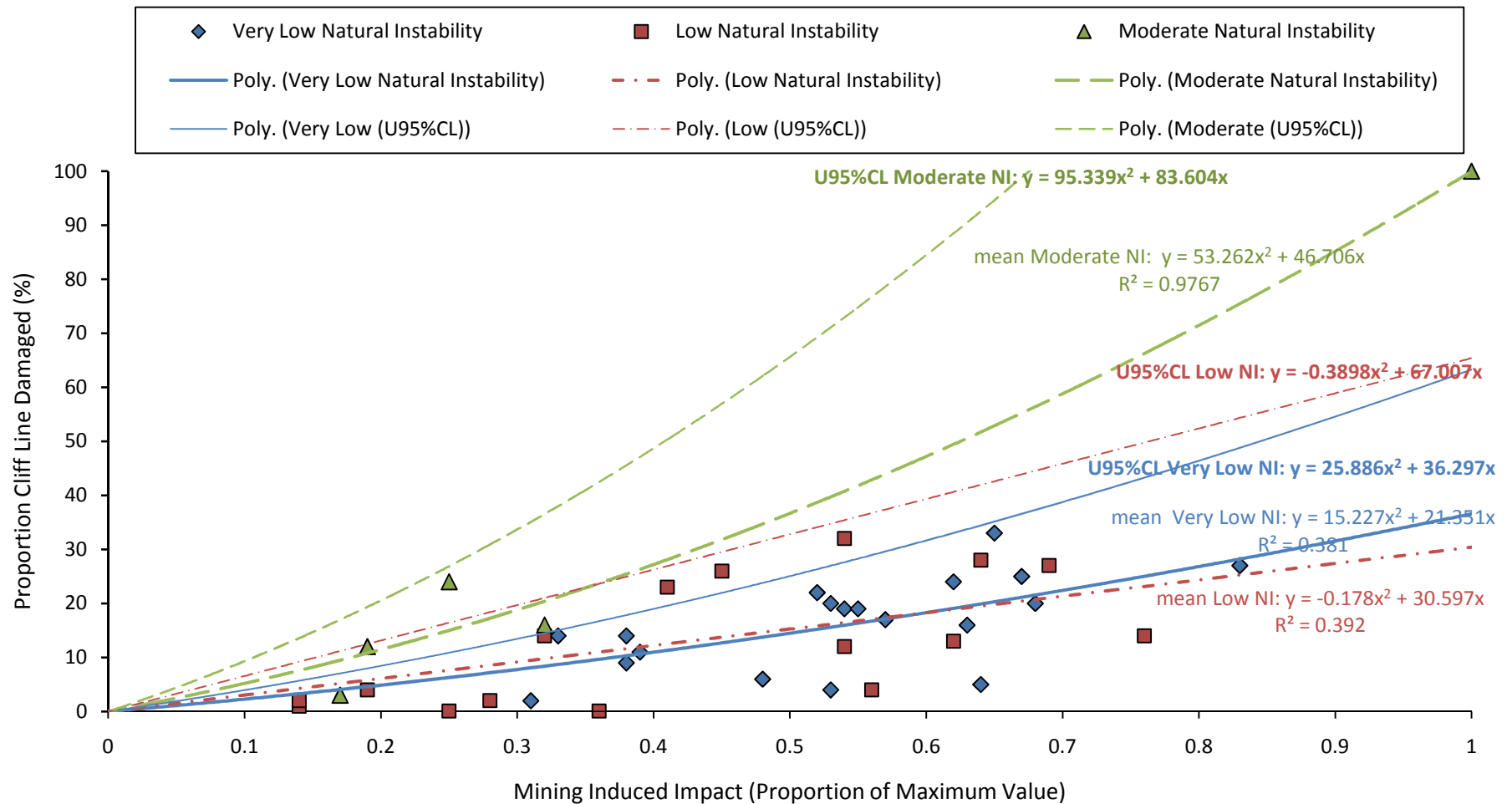
Figure No: 10d




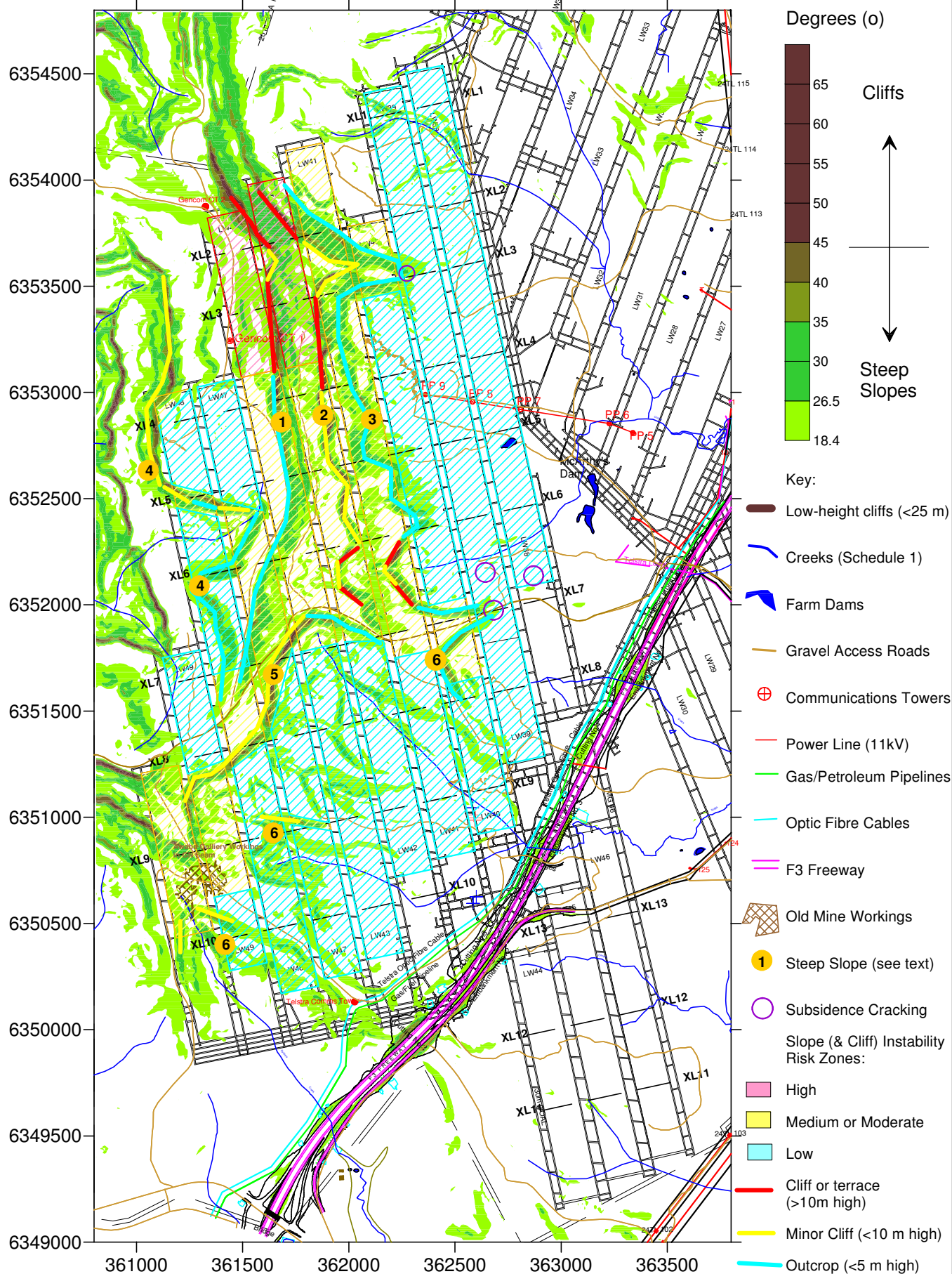
	Engineer:	S.Ditton	Client:	West Wallsend Colliery			
	Drawn:	S.Ditton		WWD-012/7			
	Date:	02.02.09	Title:	Calibration Results for Estimating Average Soil Thickness on Steep Slopes			
	Ditton Geotechnical			in Western Domain Before Mine Subsidence			
	Services Pty Ltd		Scale:	NTS		Figure No:	11a



Engineer:	S.Ditton	Client:	West Wallsend Colliery			
Drawn:	S.Ditton		WWD-012/7			
Date:	02.02.09		Title:	Estimated Factor of Safety Against Sliding of Steep Soil Slopes at West Wallsend Due to Tensile Cracking Through Soil Profile and Range of Predicted Tilt Due to Subsidence		
Ditton Geotechnical Services Pty Ltd		Scale:		NTS		Figure No:



	Engineer:	S.Ditton	Client:	West Wallsend Colliery			
	Drawn:	S.Ditton		WWD-012/7			
	Date:	25.05.11	Title:	Review of ACARP, 2002 Cliff Damage Assessment Curves in Figure 10.1			
	Ditton Geotechnical						
	Services Pty Ltd		Scale:	NTS		Figure No:	12



DgS

Engineer: S.Ditton
Drawn: S.Ditton
Date: 30.05.11

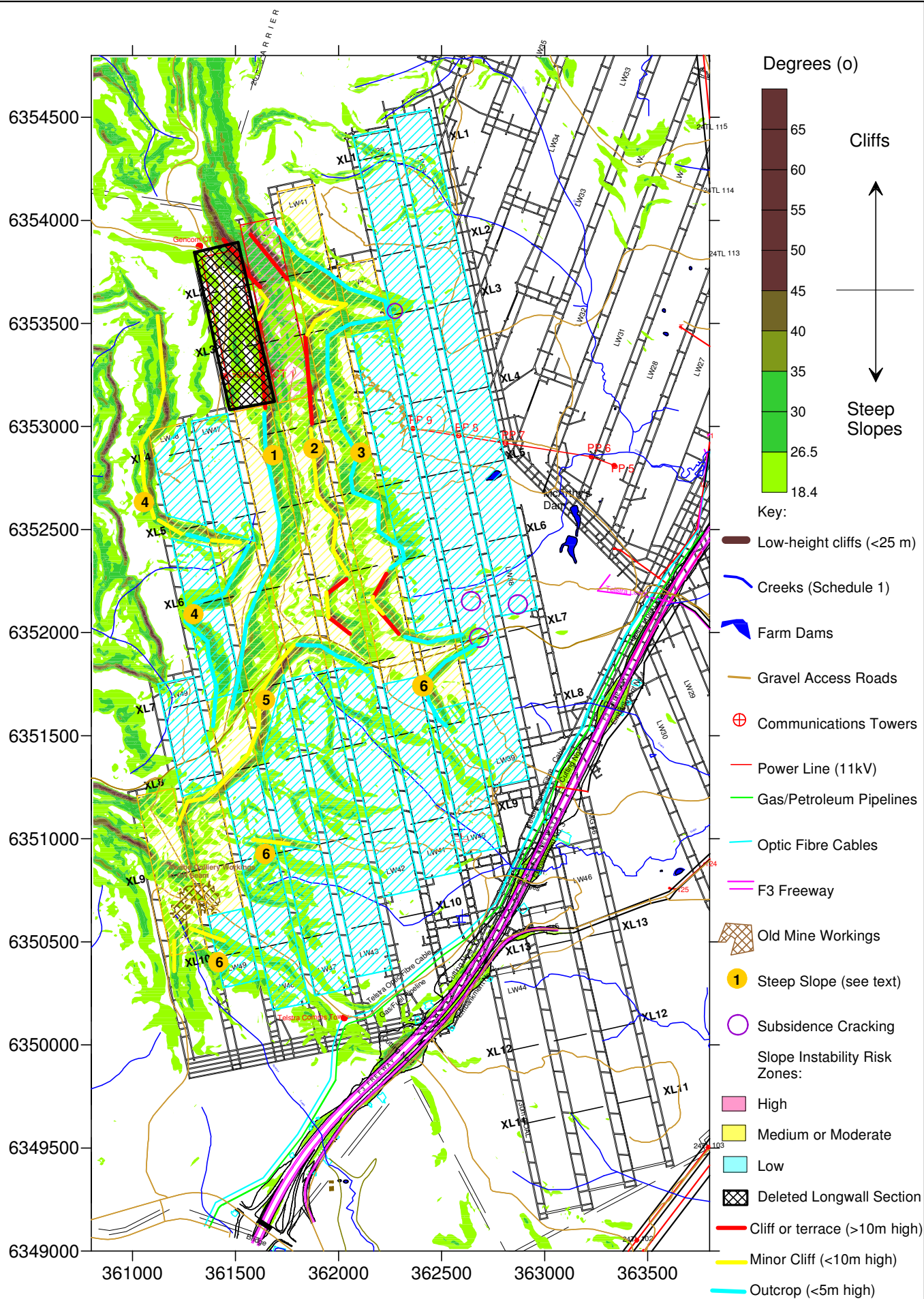
Ditton Geotechnical
Services Pty Ltd

Client: West Wallsend Colliery
WWD-012/7

Title: Potential Slope Instability Risk Zones for the Current Longwall Layout

Scale: 1:25,000

Figure No: 13



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Engineer: S.Ditton
Drawn: S.Ditton
Date: 20.07.11

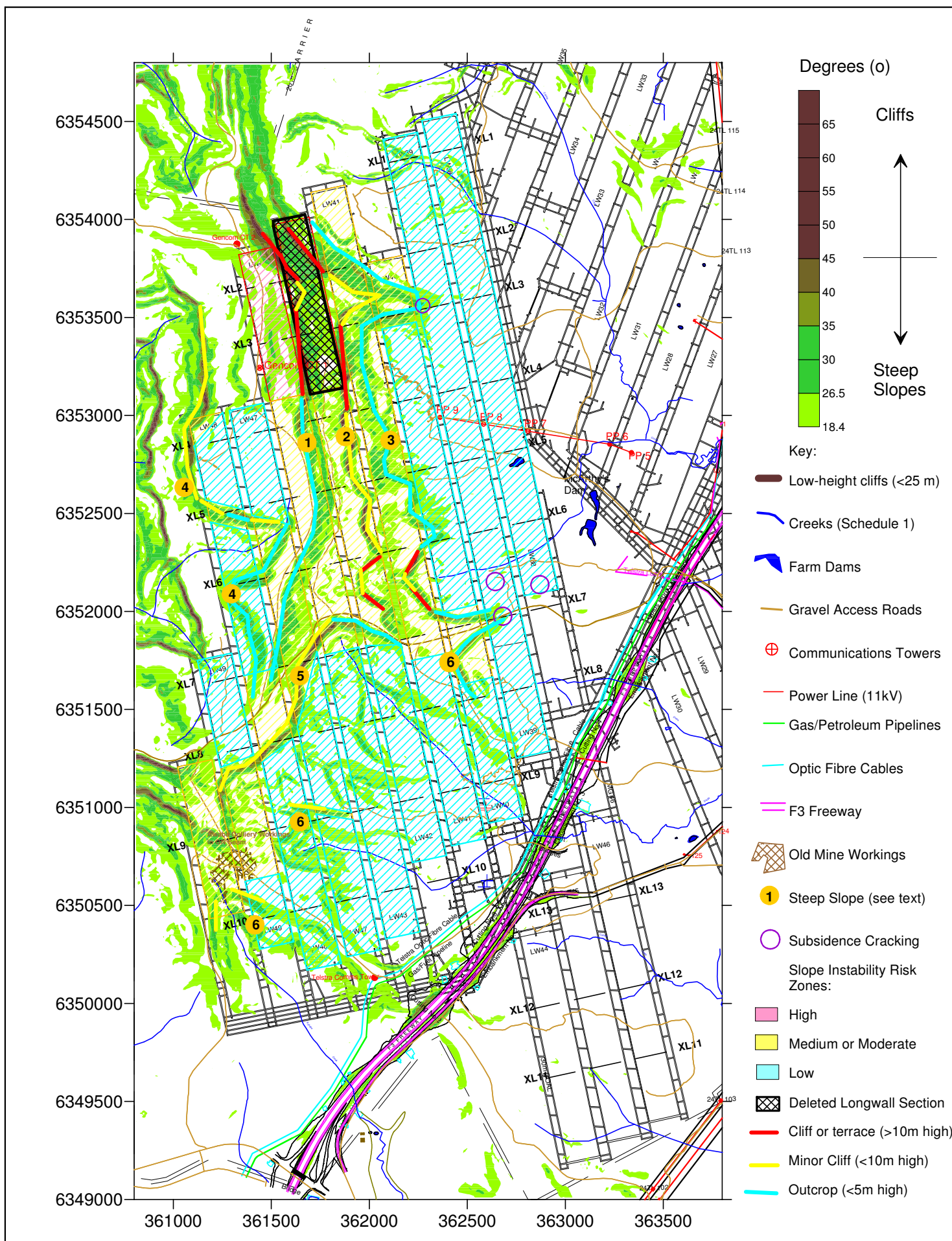
Ditton Geotechnical
Services Pty Ltd

Client: West Wallsend Colliery
WWD-012/7

Title: Amendment Option 1 for the Current Longwall Layout

Scale: 1:25,000

Figure No: 14a



DgS

Engineer: S.Ditton
Drawn: S.Ditton
Date: 30.05.11

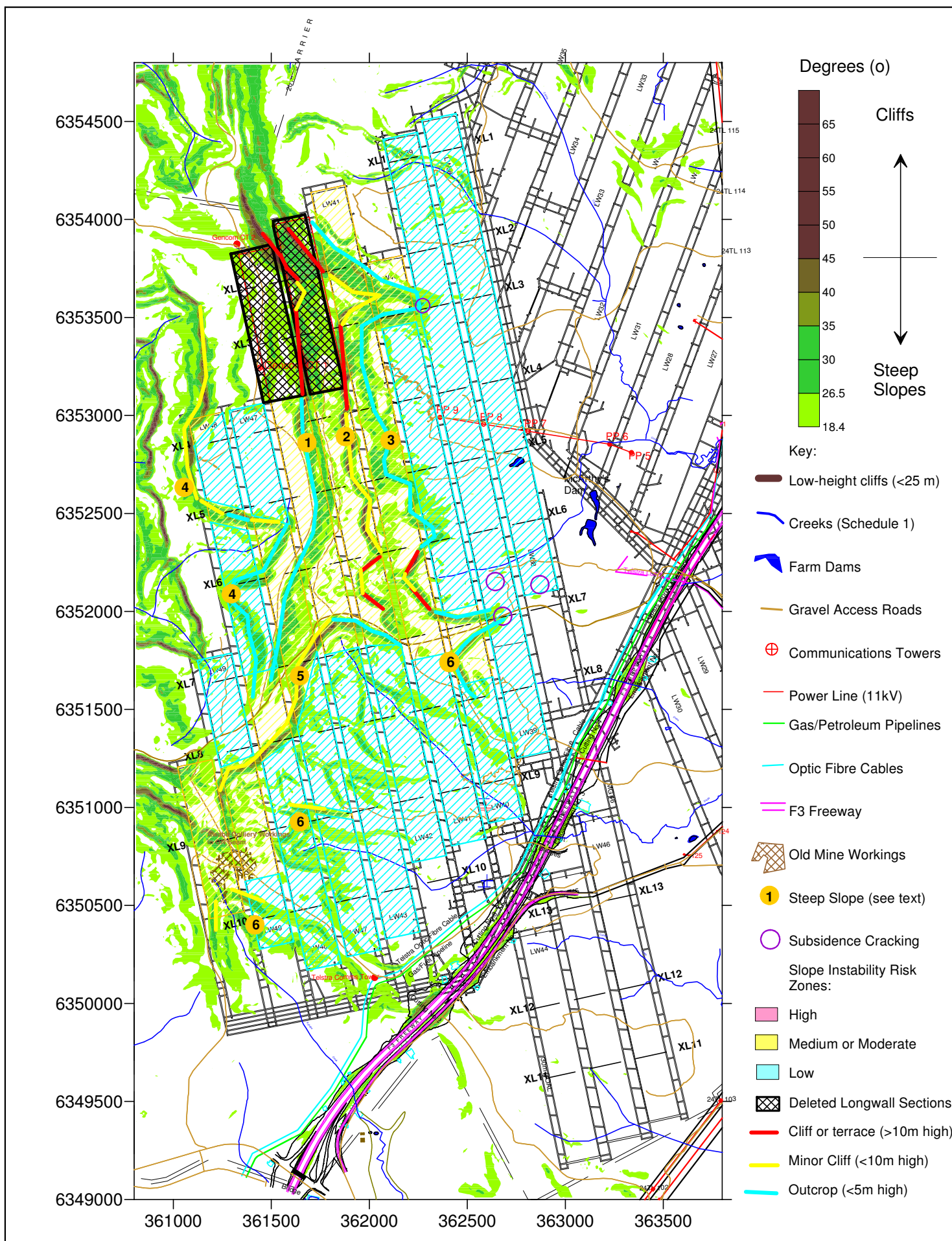
Ditton Geotechnical
Services Pty Ltd

Client: West Wallsend Colliery
WWD-012/7

Title: Amendment Option 2 for the Current Longwall Layout

Scale: 1:25,000

Figure No: 14b



DgS

Engineer: S.Ditton

Drawn: S.Ditton

Date: 30.05.11

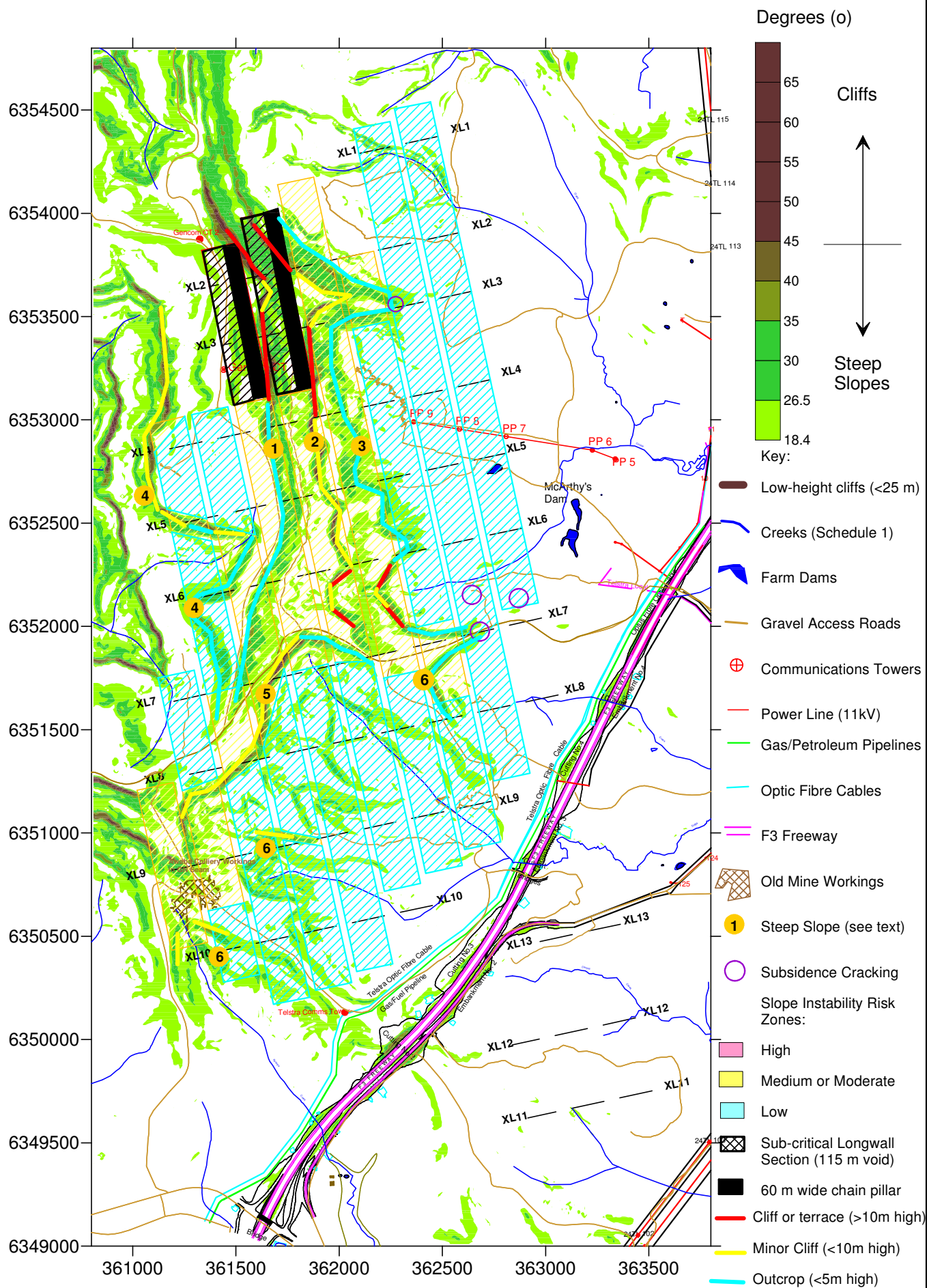
**Ditton Geotechnical
Services Pty Ltd**

Client: **West Wallsend Colliery
WWD-012/7**

Title: **Amendment Option 3 for the Current Longwall Layout**

Scale: 1:25,000

Figure No: 14c



DgS

Engineer: S.Ditton
 Drawn: S.Ditton
 Date: 30.05.11

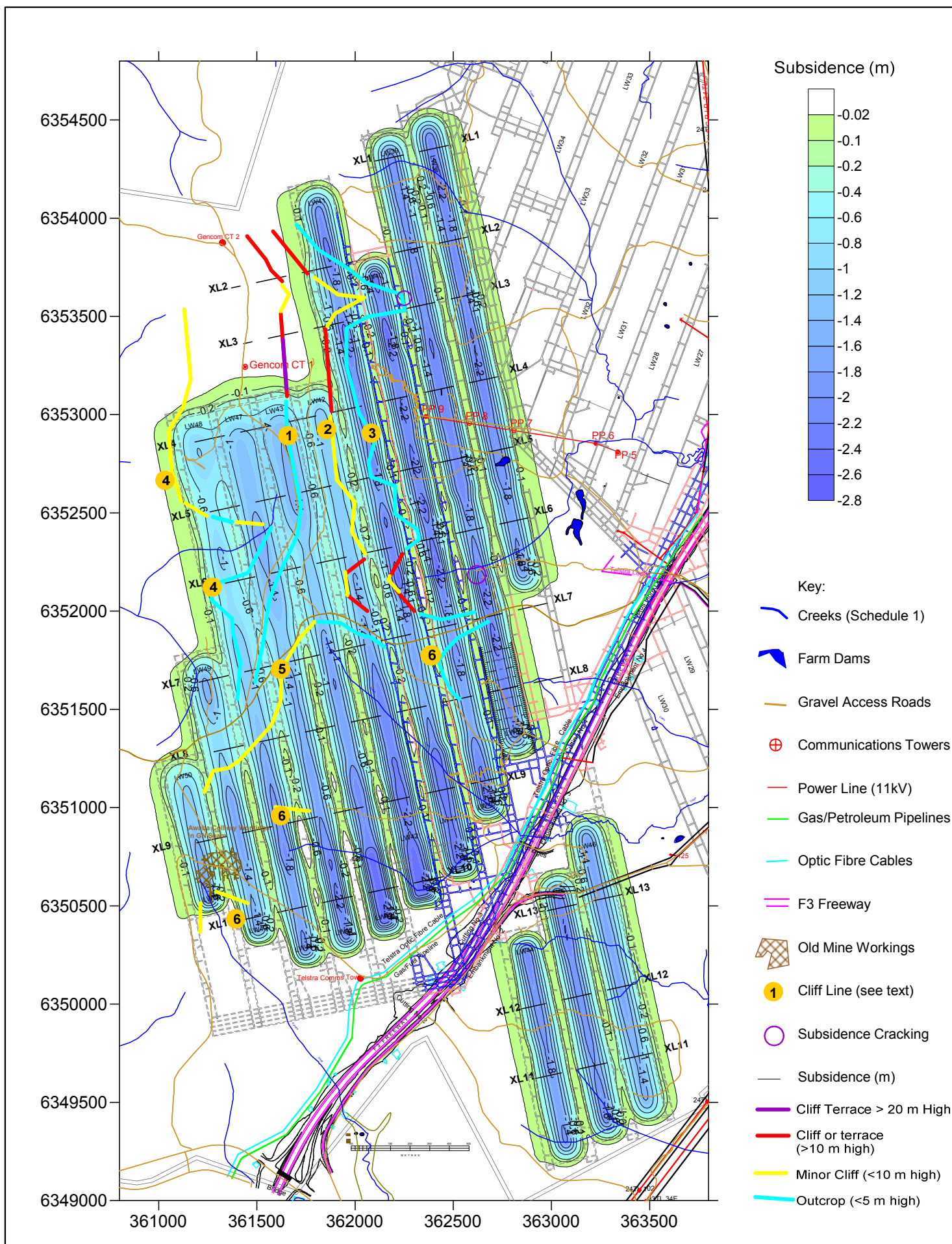
Ditton Geotechnical
 Services Pty Ltd

Client: West Wallsend Colliery
 WWD-012/7

Title: Amendment Option 4 for the Current Longwall Layout

Scale: 1:25,000

Figure No: 14d



DgS

Engineer: S.Ditton

Drawn: S.Ditton

Date: 10.08.11

**Ditton Geotechnical
Services Pty Ltd**

Client: **West Wallsend Colliery
WWD-012/7**

Title: **Predicted Worst-Case Subsidence Contours for Proposed Case 3
Longwall Layout beneath Steep Slopes and Cliff Lines in the Western
and Southern Domains**

Scale: 1:25,000

Figure No: 15a