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Proposed Motorway Service Area,
Scratchers Lane,
West Kingsdown, Kent
Agricultural Land Classification
February 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

PROPOSED MOTORWAY SERVICE AREA SCRATCHERS LANE, WEST KINGSDOWN, KENT.

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 30 hectares of land at Scratchers Lane, West Kingsdown, in Kent. The site is situated on either side of the M20 near to Brands Hatch. The survey was carried out during February 1996.
2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF), from its Land Use Planning Unit in Reading, in connection with a planning application for a motorway service area. The results of this survey supersede any previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the majority of the agricultural land on this site was in cereal cropping. To the north of the M20 land use includes both permanent and ley grassland. Gabrielspring Wood has been shown as 'Other Land'.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area	% Surveyed Area
3a	24.3	80.7	100
Other land	5.8	19.3	-
Total surveyed area	24.3	-	100
Total site area	30.1	100	-

7. The fieldwork was conducted at an average density of approximately 1 boring per hectare. A total of 27 borings and 2 soil pits were described.

8. All of the agricultural land on this site has been classified as Subgrade 3a (good quality) the key limitation being soil wetness. The profiles generally comprise moderately drained medium and heavy silty clay loams over poorly structured, slowly permeable clays. Despite the locally dry climatic regime, these soils may restrict crop growth and yields as wet soils can inhibit seed germination and root development. The medium textured topsoils may also limit the timing of cultivations as trafficking by agricultural machinery or grazing livestock may lead to structural damage.

9. The stone content in these profiles ranges from 6-14% flints > 2&6 cm and 12-20% total flint in the topsoil with 2-25% total flint below. Where more than 10% large flints (i.e. greater than 2cm in diameter) occur in the topsoil the land is also limited to Subgrade 3a on topsoil stoniness as large flints can damage agricultural machinery and wear tyres. They can also adversely affect crop growth and establishment.

10. A few borings were also found to be of slightly better quality but were not mapped separately due to their limited number and extent.

Factors Influencing ALC Grade

Climate

11. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

12. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values	Values
Grid reference	N/A	TQ 568 656	TQ 576 655
Altitude	m, AOD	135	140
Accumulated Temperature	day°C (Jan-June)	1353	1347
Average Annual Rainfall	mm	692	689
Field Capacity Days	days	141	140
Moisture Deficit, Wheat	mm	102	102
Moisture Deficit, Potatoes	mm	93	93

13. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

14. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

15. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation (Climatic Grade 1). However, climatic factors can interact with soil properties to influence soil wetness and droughtiness. At this location the field capacity day values are comparatively low thus decreasing the effects of soil wetness.

16. Local climatic factors such as frost risk and exposure are not thought likely to adversely affect agricultural land use on this site.

Site

17. The land on this site slopes gently from 140m AOD in the east to 130m AOD in the west. Nowhere on the site do either gradient or microrelief affect agricultural land quality.

18. Flooding does not appear to be limiting on this site.

Geology and soils

19. The relevant geological sheet (BGS, 1978) maps the entire site as the Upper Cretaceous Chalk overlain by clay-with-flints.

20. The most recently published soils information for this area (SSEW, 1983) maps the Batcombe soil association across the entire site. These soils are described as 'fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some well drained clayey soils over chalk.' (SSEW, 1983).

Agricultural Land Classification

21. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

22. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

Subgrade 3a

23. All of the agricultural land on this site has been classified as Subgrade 3a. The key limitation is soil wetness with occasional topsoil stoniness restrictions. The soil profiles typically comprise slightly to moderately stony (12-29% total flints including 6-14% flints >2cm) medium silty clay loam topsoils over very slightly to moderately flinty (2-20% stone) medium or heavy silty clay loam upper subsoils. Occasionally clay occurs immediately below the topsoil but it is generally found in the lower subsoil. These horizons are similarly stony but invariably become impenetrable over flinty deposits between 45-85cm depth.

24. All clays are slightly gleyed and most become poorly structured and slowly permeable from between 28-60 cm depth. Soil inspection pits 1 and 2 revealed that the moderately

structured clays are browner in colour (10YR54) with much less vibrant mottles than the poorly structured variety (75YR56). Drainage through the profile is slightly impeded by the presence of the slowly permeable horizons. In this locally dry climatic regime such soils have been assigned to Wetness Class III (see Appendix II), Wetness Grade 3a as wet soils can inhibit seed germination and root development. The medium textured topsoils may also slightly restrict the timing of cultivations as trafficking by agricultural machinery and grazing livestock may lead to structural damage.

25. Where more than 10% flints, larger than 2cm in diameter, occur in the topsoil the land is also limited to Subgrade 3a by topsoil stoniness. Large stones such as these can cause increased wear to tyres and damage farm machinery, and they can also disrupt crop establishment and growth.

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SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet No. 271, Dartford*. 1:50,000 Series. Solid & Drift.
BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land*.

MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification*.

Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South East England*.

SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*

SSEW: Harpenden

DESCRIPTIONS OF THE GRADES AND SUBGRADES

Grade 1: Excellent Quality Agricultural Land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2: Very Good Quality Agricultural Land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a: Good Quality Agricultural Land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b: Moderate Quality Agricultural Land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4: Poor Quality Agricultural Land

Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5: Very Poor Quality Agricultural Land

Land with severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Wetness Class	Duration of waterlogging ¹
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years. ²
II	The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

¹ The number of days is not necessarily a continuous period.

² 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL DATA

Contents:

Sample location map

Soil abbreviations - Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

Database Printout - Horizon Level Information

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF:** national 100 km grid square and 8 figure grid reference.
2. **USE:** Land use at the time of survey. The following abbreviations are used.

ARA: Arable	WHT: Wheat	BAR: Barley
CER: Cereals	OAT: Oats	MZE: Maize
OSR: Oilseed rape	BEN: Field Beans	BRA: Brassicae
POT: Potatoes	SBT: Sugar Beet	FCD: Fodder Crops
LIN: Linseed	FRT: Soft and Top Fruit	FLW: Fallow
PGR: Permanent Pasture	LEY: Ley Grass	RGR: Rough Grazing
SCR: Scrub	CFW: Coniferous Woodland	DCW: Deciduous Wood
HTH: Heathland	BOG: Bog or Marsh	FLW: Fallow
PLO: Ploughed	SAS: Set aside	OTH: Other
HRT: Horticultural Crops		

3. **GRDNT:** Gradient as estimated or measured by a hand-held optical clinometer.
4. **GLEYS/SPL:** Depth in centimetres (cm) to gleying and/or slowly permeable layers.
5. **AP (WHEAT/POTS):** Crop-adjusted available water capacity.
6. **MB (WHEAT/POTS):** Moisture Balance. (Crop adjusted AP - crop adjusted MD)
7. **DRT:** Best grade according to soil droughtiness.
8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL: Microrelief limitation **FLOOD:** Flood risk **EROSN:** Soil erosion risk
EXP: Exposure limitation **FROST:** Frost prone **DIST:** Disturbed land
CHEM: Chemical limitation

9. **LIMIT:** The main limitation to land quality. The following abbreviations are used.

OC: Overall Climate	AE: Aspect	EX: Exposure
FR: Frost Risk	GR: Gradient	MR: Microrelief
FL: Flood Risk	TX: Topsoil Texture	DP: Soil Depth
CH: Chemical	WE: Wetness	WK: Workability
DR: Drought	ER: Erosion Risk	WD: Soil Wetness/Droughtiness
ST: Topsoil Stoniness		

Soil Pits and Auger Borings

1. **TEXTURE:** soil texture classes are denoted by the following abbreviations.

S: Sand	LS: Loamy Sand	SL: Sandy Loam
SZL: Sandy Silt Loam	CL: Clay Loam	ZCL: Silty Clay Loam
ZL: Silt Loam	SCL: Sandy Clay Loam	C: Clay
SC: Sandy Clay	ZC: Silty Clay	OL: Organic Loam
P: Peat	SP: Sandy Peat	LP: Loamy Peat
PL: Peaty Loam	PS: Peaty Sand	MZ: Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (<27% clay) **H:** Heavy (27-35% clay)

2. **MOTTLE COL:** Mottle colour using Munsell notation.
3. **MOTTLE ABUN:** Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2-20% **M:** many 20-40% **VM:** very many 40% +

4. **MOTTLE CONT:** Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL:** Ped face colour using Munsell notation.
6. **GLEYS:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.
7. **STONE LITH:** Stone Lithology - One of the following is used.

HR: all hard rocks and stones	SLST: soft oolitic or dolimitic limestone
CH: chalk	FSST: soft, fine grained sandstone
ZR: soft, argillaceous, or silty rocks	GH: gravel with non-porous (hard) stones
MSST: soft, medium grained sandstone	GS: gravel with porous (soft) stones
SI: soft weathered igneous/metamorphic rock	

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

SOIL PIT DESCRIPTION

Site Name : MSA SCRATCHERS LANE Pit Number : 1P

Grid Reference: TQ56906560 Average Annual Rainfall : 692 mm
 Accumulated Temperature : 1353 degree days
 Field Capacity Level : 141 days
 Land Use : Cereals
 Slope and Aspect : 01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MZCL	10YR42 00	7	9	HR					
29- 47	HZCL	10YR54 00	0	15	HR		MDCSAB	FR	M	
47-120	C	75YR56 00	0	20	HR	M	MDCAB	FM	P	

Wetness Grade : 3A Wetness Class : III
 Gleying : cm
 SPL : 047 cm

Drought Grade : 2 APW : 120mm MBW : 18 mm
 APP : 101mm MBP : 8 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : MSA SCRATCHERS LANE Pit Number : 2P

Grid Reference: TQ56906560 Average Annual Rainfall : 692 mm
 Accumulated Temperature : 1353 degree days
 Field Capacity Level : 141 days
 Land Use :
 Slope and Aspect : 01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MZCL	10YR42 00	7	9	HR					
29- 47	HZCL	10YR54 00	0	15	HR		MDCSAB	FR	M	
47-120	C	10YR54 00	0	2	HR	M	MDCSAB	FR	M	

Wetness Grade : 1 Wetness Class : I
 Gleying : cm
 SPL : No SPL

Drought Grade : 1 APW : 136mm MBW : 34 mm
 APP : 113mm MBP : 20 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Topsoil Stoniness

SAMPLE ID.	GRID REF	ASPECT USE	--WETNESS--				-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYS	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	TQ57216578	LEY		028	2	2	074	-28	074	-19	3B				DR	2	Q Disturbed
1P	TQ56906560	CER W	01	047	3	3A	120	18	101	8	2				WE	3A	B11 S1 Gley 47
2P	TQ56906560	CER W	01		1	1	136	34	113	20	1				ST	2	S1 Gley 47
5	TQ57006570	CER		028	3	3A		0		0					WE	3A	3A T/S Stones
6	TQ57106570	CER		045	3	3A		0		0					WE	3A	3A T/S Stones
7	TQ57406570	LEY		028	3	3A		0		0					WE	3A	3A T/S Stones
8	TQ57306570	LEY		035	3	3A	121	19	098	5	2				WE	3A	S1 Gleyed 35
10	TQ56826578	CER		050	2	2	095	-7	100	7	3A				WD	2	2 T/S Stones
11	TQ56906560	CER W	01	045	3	3A		0		0					WE	3A	S1 Gleyed 45
12	TQ57006560	CER		050 060	2	2	128	26	105	12	2				WD	2	2 T/S Stones
13	TQ57106560	CER		028	3	3A		0		0					WE	3A	3A T/S Stones
14	TQ57206560	CER		040	3	3A		0		0					WE	3A	3A T/S Stones
15	TQ57406560	LEY		030	3	3A		0		0					WE	3A	3A T/S Stones
16	TQ57506560	LEY			1	1	070	-32	070	-23	3B				DR	2	2 T/S Stones
17	TQ57606560	LEY		030	3	3A		0		0					WE	3A	S1 Gleyed 30
18	TQ56806550	CER S	01	035	3	3A		0		0					WE	3A	S1 Gleyed 35
19	TQ56906550	CER W	01	030	3	3A		0		0					WE	3A	S1 Gleyed 30
20	TQ57006550	CER W		060	2	2	094	-8	106	13	3A				WD	2	2 T/S Stones
21	TQ57106550	CER		030	3	3A		0		0					WE	3A	S1 Gleyed 30
22	TQ57206550	CER		028	3	3A		0		0					WE	3A	S1 Gleyed 28
23	TQ57306550	CER E	02	027	3	3A		0		0					WE	3A	S1 Gleyed 27
24	TQ57506550	PGR		085	1	1	141	39	116	23	1				ST	2	S1 Gleyed 85
25	TQ57606550	PGR		035	3	3A		0		0					WE	3A	S1 Gleyed 35
26	TQ57706550	PGR		050 028	3	3A		0		0					WE	3A	3A T/S Stone
27	TQ57306540	CER E	02	030	3	3A		0		0					WE	3A	S1 Gleyed 30
28	TQ57406540	CER E	02	028	3	3A		0		0					WE	3A	S1 Gleyed 28
29	TQ57506530	CER E	02	035	3	3A		0		0					WE	3A	S1 Gleyed 35
30	TQ57555022	CER E	01	040	3	3A		0		0					WE	3A	S1 Gleyed 40
31	TQ57645038	PGR N	01	035	3	3A		0		0					WE	3A	3A T/S Stone

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR	POR	IMP	SPL
1	0-28	mzc1	10YR43 00					9	2	HR	15						
	28-40	mzc1	10YR42 00	75YR46	00	M		Y	0	0	HR	25		M			
	40-50	mzc1	10YR54 00					0	0	HR	25		M				Imp Flinty
1P	0-29	mzc1	10YR42 00					7	0	HR	9						
	29-47	hzc1	10YR54 00					0	0	HR	15	MDCSAB	FR	M			
	47-120	c	75YR56 00	05YR58	00	M	00MN00	00	S	0	0	HR	20	MDCAB	FM	P	Y
2P	0-29	mzc1	10YR42 00					7	0	HR	9						
	29-47	hzc1	10YR54 00					0	0	HR	15	MDCSAB	FR	M			
	47-120	c	10YR54 00	75YR58	00	M		S	0	0	HR	2	MDCSAB	FR	M		
5	0-28	mzc1	10YR43 00					14	3	HR	20						
	28-50	c	10YR56 00	75YR58	56	M	00MN00	00	S	0	0	HR	20		P		Y
	50-65	c	75YR56 00	75YR58	68	M	00MN00	00	S	0	0	HR	25		P		Y
6	0-28	mzc1	10YR43 00					12	0	HR	20						
	28-45	mzc1	10YR54 00					0	0	HR	15		M				
	45-70	c	10YR56 00	75YR56	58	M	00MN00	00	S	0	0	HR	15		P		Y
7	0-28	mzc1	10YR43 00					14	4	HR	20						
	28-55	c	75YR54 00	75YR58	00	M	00MN00	00	S	0	0			P			Y
	55-80	c	75YR54 00	75YR58	68	M	00MN00	00	S	0	0	HR	15		P		Y
8	0-28	mzc1	10YR43 00					8	2	HR	15						
	28-35	mzc1	10YR44 00					0	0	HR	15		M				
	35-55	c	75YR54 00	75YR56	00	M	00MN00	00	S	0	0	HR	15		P		Y
	55-120	c	75YR54 00	75YR68	56	M	00MN00	00	S	0	0			P			Y
10	0-20	mzc1	10YR42 00	75YR46	00	F		9	0	HR	15						
	20-50	hzc1	10YR54 00	75YR46	00	F		0	0	HR	15		M				
	50-80	c	10YR56 00	75YR66	00	M	00MN00	00	S	0	0	HR	10		P		Y
11	0-30	mzc1	10YR42 00					7	3	HR	15						
	30-45	hzc1	10YR54 00					0	0	HR	15		M				
	45-60	c	10YR56 00	75YR66	00	M	00MN00	00	S	0	0	HR	25		P		Y
12	0-28	mzc1	10YR43 00					8	2	HR	15						
	28-50	mzc1	10YR44 00					0	0	HR	15		M				
	50-60	hzc1	10YR53 00	10YR58	62	M		Y	0	0	HR	15		M			
	60-120	c	10YR53 00	10YR58	62	M		Y	0	0				P			Y
13	0-28	mzc1	10YR43 00					11	3	HR	20						
	28-65	c	10YR56 00	75YR56	00	M	00MN00	00	S	0	0	HR	15		P		Y
	65-120	c	10YR56 00	75YR68	58	M	00MN00	00	S	0	0			P			Y
14	0-28	mzc1	10YR43 00					11	3	HR	20						
	28-40	hzc1	10YR54 00					0	0	HR	15		M				
	40-60	c	75YR54 00	75YR56	58	M	00MN00	00	S	0	0	HR	15		P		Y

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED		-----STONES-----			STRUCT/	SUBS			SPL	CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	CONSIST	STR		
15	0-30	mzc1	10YR43 00						12	3	HR	20					
	30-55	c	75YR46 00	75YR58 00	M		00M00 00	S	0	0	HR	20		P		Y	Imp Flinty
16	0-28	mzc1	10YR43 00						7	2	HR	15					
	28-40	mzc1	10YR54 00						0	0	HR	15		M			
	40-45	mzc1	10YR54 00						0	0	HR	25		M			Imp Flinty
17	0-30	mzc1	10YR42 00						7	3	HR	15					
	30-65	c	10YR56 00	75YR68 00	M			S	0	0	HR	20		P		Y	Imp Flinty
18	0-28	mzc1	10YR43 00						7	0	HR	15					
	28-35	hzc1	10YR54 00						0	0	HR	15		M			
	35-60	c	10YR56 00	75YR68 00	M		00M00 00	S	0	0	HR	20		P		Y	Imp Flinty
19	0-30	mzc1	10YR42 00						6	2	HR	12					
	30-78	c	10YR56 00	75YR58 00	M		00M00 00	S	0	0	HR	10		P		Y	Imp Flinty
20	0-30	mzc1	10YR42 00						6	0	HR	12					
	30-60	c	10YR54 00	75YR66 00	M		00M00 00	S	0	0	HR	5		M			See 1P
	60-70	c	10YR56 00	75YR68 00	M		00M00 00	S	0	0	HR	25		P		Y	Imp Flinty
21	0-30	mzc1	10YR42 00						7	4	HR	15					
	30-70	c	10YR56 00	75YR66 00	M		00M00 00	S	0	0	HR	20		P		Y	
	70-95	hzc1	10YR54 00	75YR66 00	C			S	0	0	HR	5		M			
	95-120	hzc1	10YR56 00						0	0	CH	15		M			
22	0-28	mzc1	10YR43 00						8	2	HR	15					
	28-70	c	75YR54 00	75YR56 68	M		00M00 00	S	0	0		0		P		Y	
	70-120	hc1	25Y 63 00	10YR56 00	M			Y	0	0		0		P		Y	
23	0-27	mzc1	10YR42 43						10	0	HR	13					
	27-45	c	75YR46 00	05YR56 00	C		00M00 00	S	0	0	HR	15		P		Y	Imp Flinty
24	0-35	mzc1	10YR42 00						6	0	HR	12					
	35-85	mzc1	10YR54 00						0	0	HR	5		M			
	85-120	c	10YR56 00	75YR68 00	M			S	0	0		0		P		Y	
25	0-35	mzc1	10YR42 00						6	0	HR	12					
	35-60	c	10YR56 00	75YR68 00	M			S	0	0	HR	2		P		Y	Imp Flinty
26	0-28	mzc1	10YR42 00						11	5	HR	20					
	28-50	c	75YR56 00	05YR58 00	C			S	0	0	HR	2		P		Y	
	50-120	hc1	25Y 63 00	75YR58 00	M			Y	0	0	HR	8		P		Y	V Firm
27	0-30	mzc1	10YR42 00						6	0	HR	8					
	30-45	c	75YR56 00	75YR58 00	C		00M00 00	S	0	0	HR	2		P		Y	
	45-50	c	75YR56 00	75YR58 00	C		00M00 00	S	0	0	HR	25		P		Y	Imp Flinty

