

the **lead** legacy

The Prospects for the Peak District's Lead Mining Heritage

APPENDICES

Appendix A:**The Main General, Archaeological and Ecological Outputs of the Lead Rakes Project to Date****General**

1. An aerial photograph assessment of the orefield as a whole, with the aid of English Heritage funding, to quantify levels of survival and loss of surface remains. A technical report was produced on the surviving resource, detailing the results and assessing the level of protection by statutory designation and agri-environment schemes [4]. It also included a provisional Inventory of 'Lead Mining Sites' of special importance and an Inventory of 'Important Lead Mining Landscapes', and made provisional recommendations for changes in conservation practice necessary to further the retention of the lead rake resource. These aspects of the report have been subsequently developed further and are outlined in this report.

Archaeology

1. The commissioning of a detailed desktop study, for the orefield as a whole, which quantified the loss of significant lead mining features such as gin circles, engine houses, crushing circles and buddles [54].
2. The commissioning of seven reports giving the historical background to the mining areas subject to detailed ecological fieldwork evaluations (see below). These cover Bonsall Moor, Bradwell Moor (including parts of the Castleton and Peak Forest area), Winster, Elton, Wensley, and a large area centred on Monyash and Flagg [55, 57, 59-63]. In the case of the Bonsall Moor and Bradwell Moor reports, these are complemented by several reports previously prepared [49, 50, 52, 53, 64-68] and there is a further report on the Alport area [51].
3. The commissioning of detailed aerial photograph surveys by the Royal Commission for the Historic Monuments of England (now English Heritage) of Bradwell Moor in 1998 and of the Bonsall Moor/Elton/Winster/Wensley area in 1999.
4. Extensive fieldwork and desk-based assessment to produce refined archaeological Inventories of 'Important Lead Mining Sites' and 'Landscapes'. These are presented in summary here and detailed in a technical report [7].

Ecology

Work began in 1997 to survey the whole of the lead rake resource within the National Park to a detailed level. The following areas have been surveyed [15-20] and comprise approximately two-thirds of the total area of the resource:

1. Bonsall Moor
2. Castleton/Peak Forest
3. Bradwell
4. Winster
5. Elton
6. Monyash
7. Sheldon/Taddington/Flagg (assesment ongoing 2003)

If future funding can be secured it is the intention to complete this important record of the ecological interest to be found on lead rakes to further inform the Peak District Biodiversity Action Plan and the conservation of lead mining sites.

Appendix B:**Archaeological Features with Category A Status in the Inventory of Regionally and Nationally Important Lead Mining Sites in the Peak District Orefield****Overview**

The archaeological assessment of lead mining remains has documented the varied character of the resource and identified the locations of a wide range of features which survive. A brief overview is given here, while a catalogue of Category A features by specific feature-type is given in tabular form below and details of each site are given in Appendix C. Further details and analyses are given in a technical report [7].

The type of *hillocks* found varies according to geological and historical factors as outlined in Chapter 4. Representative examples in good condition of all types have been identified and given Category A status. These include a number of examples of hillocks at rake veins. While many of the very largest of these have been extensively reworked for gangue minerals, two fine examples survive at Tideslow Rake near Great Hucklow and Oxlow Rake above Peak Forest. A sample of hillocks at isolated small veins has also been included as Category A to ensure this once common type of feature is represented. Commonly, extensive but often individually relatively-small hillocks are found where many small veins occur together and/or where there are complex pipeworkings underground. In both cases survival to today has been relatively good because of the difficulty of improving such land for agricultural purposes. These workings are particularly common in the southern half of the orefield. Rarities include small hillocks at outcropping pipes and at mineralisation in limestone joints (known as blockwork). Large but deep pipeworkings, veinworking at depth under shale overburden, and sough airshafts, all result in distinctive, often-large, spaced hillocks. Surviving examples are again relatively rare compared with vein workings at surface.

Some sites are particularly important as they have direct relationships with *medieval and earlier agricultural features* such as strip lynchets and field banks, and thus give information on the relative age of the mining. While the hillocks often overlie such features, in one case at least on Carsington Pasture, there are strong indications that some of the mining is earlier. *Reworking of hillocks* for previously discarded ore was very common, particularly in the 16th and 18th centuries with radical improvements in smelting technology, and in the 19th century when rich ore sources underground were becoming scarce. A small number of sites have been highlighted where evidence for such practices are particularly clearly seen. Early fluorspar extraction concentrated on the richest deposits and hillocks were often not fully removed, nor were sites 'restored'. Two examples have been included that represent this activity particularly well.

Of the common surface features found at many mines, a number of sites have *opencuts* that have not been fully backfilled by lead or gangue miners. In a few cases these are particularly deep with rock walls, as at Odin Mine and Dirlow Rake, both near Castleton, and at the High Tor Mines above Matlock. The grass-covered opencuts at Tideslow Rake near Great Hucklow are exceptionally large, while there are rare pipeworking opencasts at the Dunnington and Hardbeat Mines at Elton. While there are many *shafts* remaining, despite the majority having been lost, nearly all are now capped with old railway sleepers or concrete and thus are not easily visible. However, a range of engine and climbing shafts can be viewed in safety at the grilled examples at Magpie Mine. Further good examples of grilled engine shafts exist at Jowle and Watts Groves on Eldon Hill, at Old Seedlow Mine near Wardlow and at the Ecton Mines. Unusual shafts include that for the *Dakeyne Engine* at Bateman's House in Lathkill Dale and those with climbing stones at

Greensward Rake near Monyash. *Mine access levels* were always less common than shafts and are usually found on steep dalesides, as for example flanking the Via Gellia west of Cromford.

Coes, often at or near shafts and levels, are usually small and ruined, although there are also examples of 18th and 19th century date that are relatively large. Some stand to nearly full height, as at How Grove on Dirlow Rake, at the Fieldgrove Vein near Sheldon, at the lower Lee Close Mines near Wensley and at Jacobs Dream Mine in the Via Gellia. Virtually all mines once also had *dressing floors* adjacent to their shaft tops or level entrances. However, many have been disturbed by later mining and hillock reworking. Notable exceptions include small examples on Bonsall Lees, Black Rakes and Snake Mine all above the Via Gellia, and late reworking floors at How Grove on Dirlow Rake, at Maury Mine near Priestcliffe, and at Great Rake Mine above Carsington. Associated with many dressing floors there are *water storage ponds*, together with *ore-dressing ponds and pits*. This aspect of the surface archaeology has previously been little studied, but it is clear after recent fieldwork that these features are relatively common and very varied in type. There are complex suites of such features on Oxlow and Tideslow Rakes and many simpler arrangements elsewhere. In the Winster and Wensley area there are good examples of leats for water that was drawn up shafts from underground. Many mining sites were walled out, in enclosures known as belland yards, to keep stock away from the toxic waste heaps. In some cases these appear to have been created late, when commons were enclosed, in some instances perhaps after the mines were abandoned. Some mine enclosures are integrated with the general field layout, as at Tideslow Rake and at Magpie Mine, while other *belland yards* lay within larger enclosures, as at the Linacre/Slitherstones/Eldon Hill area above Peak Forest and at the High Low Mines near Sheldon.

Rare and special mining features are too numerous in type to enumerate here. Amongst the highlights are *engine houses*, with a particularly early example at Ecton and large Cornish engine houses at Magpie Mine near Sheldon, at Mandale Mine in Lathkill Dale and at Old Millclose Mine near Darley Bridge. The simpler horse-gin engines frequently left a footprint in the form of a *gin circle*. There are a number of well-preserved examples of these, including particularly large ones at Ecton and at High Rake near Great Hucklow. A relatively rare type of gin circle comprises examples terraced into slopes as opposed to being set on hillock tops which is the norm. A further set of distinctive circular features is horse-drawn *ore crushers*, with surviving horse tracks and/or crushing wheels. These include the well-known atypical example at Odin Mine and an exceptionally well-preserved one at How Grove. Other *ore-dressing* features include rare banks of *bouse teems* for ore washing and small, stone-lined *buddling troughs*. The best survival of the former is at Brightside Mine near Hassop, while there are particularly interesting examples of the latter at Winster Pitts and Bonsall Lees. Atypical buddles have been excavated and conserved at How Grove. Notable examples of *sough entrances* include those at Magpie Sough by the River Wye, Mandale Sough in Lathkill Dale and Meerbrook Sough by the River

A	B	C
Particularly large rakes	2	12, 30
Other rakes	22	4, 5, 9, 10, 11, 14, 15, 30, 41, 43, 44, 50, 51, 52, 54, 59, 63, 64, 76, 87, 118, 119
Smaller veins - multiple, closely-spaced, type	21	9, 40, 58, 63, 70, 74, 96, 97, 98, 99, 103, 106, 107, 110, 112, 113, 115, 117, 118, 119, 121
Smaller veins - fewer/single type	6	17, 46, 61, 109, 112, 114
Blockwork	1	103
Pipes/flats (often with veins) - mined at surface	5	51, 57, 87, 99, 100

Derwent.

The visible surface mining features of all types may well be mostly post-medieval in date, although many hillocks may have earlier origins and/or mask medieval or even Roman features. In a few cases rare documentary evidence allows medieval origins to be confirmed, although, with the current absence of archaeological excavation, identifiable physical evidence at surface remains elusive (in contrast, recent research underground has identified several medieval/early post-medieval mines). One exceptional site is the Ecton Mines where recently identified archaeological evidence has demonstrated prehistoric copper mining dating to about 3500-4000 years ago.

Some mining sites take on additional importance because they include relatively complete complexes of features and thus tell us much about how mining was organised. These range from the exceptionally large and complete site at Magpie Mine to a small walled dressing floor with only a drawing shaft, a climbing shaft, a coe and a stone-lined buddling trough at Black Rakes. Between these two extremes there is a wide variety of sites, including a broad range of features; this makes all these sites valuable as they illustrate the complexity of the archaeological evidence.

Underground features include a wide variety of types, some with rare and special features. Lists of sites and important features accessible to explorers with specialist equipment and training are given in the Inventories and below. There may well be further underground features that await discovery at a significant number of sites where access is currently difficult. This said, the majority of the thousands of miles of mine passages that once existed have now undoubtedly collapsed or their entrances to all intents and purposes are irrevocably sealed.

Types of Category A Archaeological Interest at Sites in the Inventory

The following table lists all Category A examples of the wide variety of features of conservation interest found at Peak District lead rakes. With hillocks and common features only important representative examples are given.

KEY

- A: Feature type.
- B: Number of listed sites with Category A examples (further minor/damaged examples are given in Appendix C, which are category B and not listed here). With the 'rare/special', 'mine complexes' and 'underground' lists this includes all examples, except where they are marked +, where the number of site entries is counted.
- C: Sites (numbered following the Inventory).

Important Surface Remains - Hillocks

A	B	C
Pipes/flats (often with veins) - mined below ground	14	39, 56, 86, 87, 91, 93, 96, 98, 100, 102, 108, 109, 112, 120
Mining under shale	6	1, 10, 36, 37, 90, 116
Sough hillocks	11	1, 2, 3, 31, 34, 37, 38, 51, 60, 84, 85, 87
Clear relationships with medieval and earlier field and settlement earthworks	7	96, 98, 99, 100, 106, 119, 121
Notable examples of pre-20th century hillock reworking	6	12, 14, 30, 52, 64, 76
Notable examples of early gangue reworking	2	43, 104

Important Surface Remains - Common Features

A	B	C
Opencuts - deep with rock sides	10	1, 6, 16, 18, 40, 47, 49, 50, 81, 111
Opencuts - grass-covered sides but particularly large	2	30, 87
Opencuts - shallow (some with rock sides)	26	4, 6, 9, 10, 11, 12, 14, 15, 17, 41, 42, 43, 46, 50, 51, 52, 54, 63, 64, 81, 88, 94, 98, 104, 107, 115
Sites with shafts visible at surface - engine shafts (notable examples only)	14	7, 9, 10, 30, 33, 35, 37, 42, 63, 64, 78, 94, 109, B26
Sites with shafts visible at surface - climbing/drawing shafts (notable examples only)	4	64, 66, 107, 113
Access level entrances	12	40, 46, 49, 78, 86, 102, 107, 109, 110, 112, 113, 114
Coes	46	4, 9, 6, 12, 13, 14, 15, 16, 17, 27, 30, 40, 42, 43, 44, 45, 46, 51, 52, 62, 64, 65, 69, 76, 87, 90, 93, 94, 97, 99, 100, 102, 106, 107, 110, 112, 113, 114, 115, 116, 117, 118, 119, 121, B34, B35
Dressing floors	34	1, 5, 6, 9, 10, 11, 12, 13, 16, 17, 18, 30, 32, 36, 40, 44, 52, 62, 63, 64, 65, 86, 93, 99, 103, 106, 107, 108, 109, 113, 114, 116, 118, 119
Water storage and ore-dressing ponds, and dressing pits	30	6, 9, 10, 11, 12, 13, 15, 16, 18, 27, 30, 40, 42, 44, 46, 51, 52, 62, 64, 65, 70, 72, 76, 87, 93, 99, 100, 103, 109, 119
Belland yards	37	5, 6, 9, 10, 11, 12, 13, 14, 15, 17, 18, 25, 27, 30, 32, 39, 40, 42, 43, 51, 52, 54, 57, 62, 63, 64, 65, 69, 81, 86, 107, 108, 109, 110, 112, 113, 119

Important Surface Remains - Rare/Special Features

A	B	C
Newcomen and other 18th century engine houses	6	25, 39, 99, 100, 109, B33
19th century Cornish engine houses, miners' dries, boiler houses and chimneys	7	30 (two), 64 (two), 78, B25, B26
19th century horizontal engine houses, boiler houses and chimneys	16	10 (two), 12, 27, 33, 49, 64 (two), 66, 109 (three), B1, B5, B7, B35
Engine house reservoirs	5	30, 39, 64, 108, 109
Mine offices/reckoning houses/overseers' houses/smithies, etc	30	10, 30 (two), 32, 39 (three), 48, 49 (two), 50 (two), 63, 64 (two), 77, 78, 97, 109 (seven), 116, B5 (two), B21, B26
Powder houses	7	64, 78, 109, 113, 119, B1, B22
Smelters at mine sites	2	109 (two)
Possible calciners at mine sites	1	108
Ore houses	1	B24
Soughs - open tails	16	78, 85, 98, 100, 108, 109 (two), 113, B11, B27, B29, B30, B31, B32, B36, B37

A	B	C
Soughs - bolt tails	10	1, 3, 34, 38, 60, 87, 106, B2, B10, B28
Soughs - open tail leats	6	40, 78, 85, B17, B18, B20
Waterwheel pits and other associated features	5	10, 78 (two), B16, B19
Leats for water raised by pumping	2	55, 64
Water blasts and associated features	1	B23
Ventilation fire houses - possible example	1	97
Gin circles - atypically large	2	30, 109
Gin circles - on hillock (or sometimes flat ground)	55	1, 4, 7, 9 (four), 28, 32, 36, 40, 42, 44, 52, 56, 62 (two), 63, 64 (four), 65, 69 (two), 75, 76, 87 (three), 91 (two), 93, 98, 102, 108, 109 (five), 110 (two), 113 (two), 114, 120, B3, B8, B9, B12 (two), B13, B14, B34
Gin circles - contoured into slope	8	4, 49 (two), 95, 109, 119, B6
Gin circles - possible cog and rung type	3	107 (two), 55
Large haulage level entrances	6	48, 49, 109 (four)
Pipe working entrances	4	51, 100, 109 (two)
Crushing circles/wheels	15	1, 6 (three), 9 (two), 12, 13 (two), 15, 30, 32, 109, B3, B4
Knockstones	2	45, 52
Bouse teams	6	12, 46, 49, 51, 109, 116
Ore storage bins	10	4 (five), 5, 9, 16, 18, 52
Trunk buddles/leats from shafts to buddles or buddle dams, or associated with ponds/large ore-washing ponds	16+	6, 12 (several), 30 (several), 40, 42, 46, 51 (several), 64 (several), 76, 87 (two), 88, 91 (two), 93 (several), 98 (several), 100, 109
Buddles - stone-lined rectangular troughs	13+	11, 91, 93 (several), 94, 97 (two or three), 99, 100 (three), 103, 107 (several), 112, 113, 114, 119
Buddles - circular and D-shaped sets	2	6, 109
Slime ponds	6	10, 12, 15, 42, 64, 119
Buddle dams	20+	9 (several), 11 (two), 12 (several), 16, 42, 43, 51, 52 (several), 4, 87 (several), 88 (two), 91 (several), 93 (several), 94 (several), 96 (two), 97 (one or two), 98 (several), 100 (several), 116, 119 (several)
Spaced shaft mounds (notable examples only)	2	4, 87
Extensive opencut pickwork	3	6 (two), 16
Beehive caps	8+	13 (several), 37, 39 (five), 63 (several), 80 (four), 97 (two), 107 (several), 116
Barrow runs (or raised launders)	5	51, 87, 97, 98 (two)
Wooden launders	1	109
Water diversion leats	1	1
Mine roads	4+	9, 11, 108 (two), 109 (several)
Tramways	4	11, 30, 52, 64
Limekilns and quarries used for mine building construction or processing waste rock	4	64 (two), 85, 109
Meerstones	2	49, 51
Sough marker stones	1	B17
20th century lead mine buildings	1	64
Late 19th and earlier 20th century gangue-processing buildings and other structures	7	43, 49, 50, 100, 119, B15, B33
20th century headgear	2	64, B15

Early Mines - Archaeological and Documentary Evidence

A	B	C
Prehistoric copper mining	1	109
Documented medieval/early post-medieval lead mines	18	1, 6, 14, 30, 47, 75, 77, 78, 99 (two), 100 (two), 103, 104, 107, 112, 115, U30 (two)

Important Surface Remains - Relatively Complete Mine Complexes

A	B	C
Larger lead mines with several features	48	1, 6, 9, 15, 27, 30, 32, 33, 36, 37, 39, 42, 49 (two), 50, 51 (two), 52 (two), 56, 62 (two), 64 (two), 65, 69, 76, 78 (three), 93 (two), 108, 109 (four), 110, 113 (two), 114, 116, 119 (two), B5, B12, B25, B35
Smaller lead mines with few features (good examples only)	18+	4, 6, 9 (several), 11 (three), 16, 17 (three), 18, 40, 46, 52, 63 (several), 86, 97, 100, 106, 107 (several), 112 (two), 113
20th century mines	7	35, 43, 49, 50, 64, 119, B33

Important Underground Remains - Types of Interest

A	B	C
Vein workings mined for lead	40+	1, 4 (three), 5, 9, 10, 16 (three), 18, 19, 40, 44, 46, 49, 52, 69 (two), 78 (two), 80, 99, 102 (several), 109, 110, 111, 112 (several), 113 (four), 114, 117, 118, 119 (several), B11, U2, U3, U4, U6, U7, U28, U30 (four), U31, U32, U34 (two), U35, U36
Pipe/flat workings mined for lead and copper (often also with veins)	34+	1, 49, 51, 69, 80, 86, 89/U14/U15, 90, 93, 96, 98, 99 (three), 100 (three), 102, 108, 109 (seven), 112 (three), 117, 118, 119 (several), B25/U24/U25, U1, U3, U5, U12/U13, U16, U17/U18, U19/U20, U24/25, U26, U29, U30 (three), U32, U34, U37
Shafts (of particular interest)	14+	30, 44, 66, 69 (several), 78, 86 (two), 109 (three), B11, B26 (two), U4, U10, U28, U29, U30 (several)
Haulage and access levels (some with sledways and tramways)	23+	1, 40, 49, 69 (two), 78 (two), 86, 93, 99, 100 (two), 109 (five), 110, 112 (several), 113 (two), U1, U6, U7, U25, U27, U30 (three), U34 (two), U35, U36
Packs of deads (of particular quality/interest)	7+	52, 86, 99, 112 (several), U25, U30 (two), U34
Stone stemples (of particular quality/interest)	4+	1, 112 (several), U31, U36
Ladderways	4	5, 109 (three)
Stairways	2	16, U25
Bundings	1	109
Striking chambers	1	109
Engine chambers	6	78, 109 (three), B21, U13
Underground pumps/pump rods	4	66, B26, U22, U25
Coffin levels	6+	69 (several), 93 (several), 112 (several), U25 (several), U30, U33
Boat levels	4	85, 109, B11, U2
Soughs (including some of coffin level type) and pumpway levels	29	38, 40, 52, 60, 78 (two), 85, 98, 100 (two), 108, 109 (two), 112 (three), B11, B27, B30, B32, B37, U3, U8, U9, U21/22/23, U26, U29, U31, U33
Engine water ingress levels	2	109, U11
Lock gates	1	B11
Dams	2	109, U2
Plankways	5	B27, 109, U2 (two), U3

A	B	C
Ventilation control walls/ducts	2	99, U25
Dressing floors	6	4, 5, 86, 93, U5, U25
Miners' workshops	2	5, U25
Water channels, launders, hotches, buddles, etc	9	93, 99, U2, U5, U17/18, U21, U22, U25, U29
Miners' artefacts (of particular interest)	2	93, U25
Miners' inscriptions (of particular interest)	6	100 (two), U2, U25, U29, U30
Pre-powder workings	13	69, 78, 99 (two), 112, 117, 118, U30 (four), U32, U34
17th century continental-type powder work	1	109
Other 17th century powder work	3	B32, U30 (two), U34
20th century workings	14	35, 46, 49, 50, 81, 100 (two), 119, B11, U30 (two), U32, U34, U37

Appendix C:

Detailed Descriptions of the Archaeological Interest at all Entries within the Inventory of Regionally and Nationally Important Lead Mining Sites in the Peak District Orefield

Main Sites - Within the National Park

- 1: Odin Mine, Knowlesgate and Engine Soughs, and Blue John Mine** - Surface features to the east include a fine crushing circle/wheel with rare iron track and 'tyre', a gin circle with associated run-in/filled shafts, a disturbed belland yard wall and disturbed dressing floor/hillocks. Nearby there is the Knowlesgate Sough bolt with a line of sough shaft hillocks between it and the mine. West of the road is an impressive opencut into the hillside, with a small entrance to a side vein to the north side, with a diverted stream in a leat running above and to the side of the main opencut. The opencut gives access to large, extensive, underground stopes, a slab-roofed level and a drystone-arched/slab-roofed cart gate. Further west there are spaced shafts (run-in or capped) and associated hillocks that were sunk to workings under the shale. At one shaft mineral was brought to the surface but these large hillocks have now been largely removed and there is a 20th century tramway bed associated with this latter activity. The other shaft hillocks include two or possibly three mounds along the early Engine Sough and a probable small shaft mound on another shale gate or trial. One shaft has a leat and this may have been used for a water blast. Odin Mine is documented as active in the second half of the 13th century. The Blue John Mine (currently a show cave) contains shafts sunk to natural caverns and historically important Blue John pipe deposits worked from the 18th century onwards.
- 2: Peakhill Sough** - Rare example of 12 or 13 closely-spaced ventilation shaft hillocks along the line of a sough or shale gate. Pairs of hillocks near the tail indicate an undocumented re-driving.
- 3: Oden Sough** - An open low bolt to an historically important sough, with four surviving large, well-spaced, ventilation-shaft mounds allowing its course across relatively flat ground to be traced.
- 4: Faucet, Slack Hole and Longcliff Rakes, Rowter, Oxlow and Maskhill Mines** - Well preserved and in places impressive hillocks with opencuts. Features include a gin circle set into the hillside at Rowter Mine and another probable example on a hillock at Longcliff Rake. The section of Faucet Rake west of Maskhill Mine has shallow surface workings with a distinctive series of spaced shaft mounds just off the surface line (presumably down to the hading vein). Here there is a series of capped shafts, ruined coes and five small ore storage bins. Underground there are shafts and large

- 5: New Rake** - The hillocks are well preserved and there are several capped shafts. Surface features include a small ore storage bin adjacent to a small dressing floor with a small rectangular hollow that may be an ore-dressing pit. Nearby there are possible ponds. This section of the vein lies within a belland yard. Underground a shaft at what is now erroneously known as James Hall Over Engine gives access to extensive stopes, internal shafts, a miners' workshop and underground dressing floor and an impressive natural vertical cavern with miners' ladderway stemples which leads down to the Speedwell Cavern and further workings.
- 6: Dirltow Rake, Pindale Side and Red Seats Veins, and How Grove and Siggate Head Mines** - Surface interest includes deep opencuts with fine pickwork of early date on Pindale Side and Dirltow Rake, mostly within large belland yards, with several grilled shafts and stopes in restored ground at the latter. On Red Seats Vein there are hillocks and a shallow opencut. It has been suggested that an adjacent 'field barn' was built for calamine processing, but there is currently no positive confirmation of this. At How Grove there is a fine mine complex, recently restored, with dressing floor, coe, crushing circle and wheel, two atypical buddles, one circular the other D-shaped, leats and a dam. There is a further complex at Siggate Head Mine above Pindale with surviving dressing floor, robbed crushing circle and pond. At Nether Dirltow Mine on Dirltow Rake part of the gin circle survives; a crushing circle and wheel here were moved several years ago from Rush Mine at Eldon Hill. The mines at Dirltow Head are documented as active in 1538 but may well have much earlier origins.
- 7: Hazard Mine** - Mostly removed, but a walled gin circle, a deep engine shaft (now grilled) and a small part of the belland yard wall are extant and there are a few remaining adjacent hillocks.
- 8: Wham and Wrangling Rakes, and Penny Mine** - Some surviving large hillocks and hollows, others completely removed, where the primary interest is ecological. There are also ruined belland yards and a few capped shafts.
- 9: Linacre, Slitherstones, Eldon Bent, Burning Drake, Wrangling Rake, Portaway, Eldon Vein, Jowle Grove, Watts Grove, Smiler, White Rakes and Hurdlow End Mines** - This area has many small and medium-sized veins with hillocks and opencuts, together

with natural dolines (surface collapses above cave passages) along the veins. At the Linacre/Slitherstones Mines there are a large number of capped shafts as well as good examples of small opencuts, small belland yards and dressing floors, coes, water storage and ore-dressing ponds, and buddle dams. Underground interest includes several deep shafts that give access to unstable stopes. On Eldon Hill there are several small veins. Interest here includes a fine belland yard with crushing circle and wheel, ruined coes, a shaft and ore-dressing ponds and pits on the hilltop at Burning Drake Mine. On the north-east side of Eldon Hill, on Eldon Bent Vein, there is a small gin circle on a low mound, with a large hollow at a run-in shaft. Nearby to the west there is a ruined small belland yard. There is a ruined coe with a small ore storage bin on Wrangling Rake, with other ruined coes and/or walled shafts nearby, while further west there is a possible coe with what may be a small ore storage bin. Still further west along this vein there is a ruined small belland yard with a possible pond and a flat area that may once have been the site of a gin or less probably a crushing circle. At the western end there is a further belland yard with a ruined coe around a shaft. On the large veins to the south, at the easternmost part at Portaway Mine, nearly everything within the belland yard has been removed. There is a small belland yard and capped shafts on the small Eldon Vein to the north. There is a crushing circle and part of the wheel, a ruined coe, a small possible part of a gin circle and a grilled engine shaft at otherwise disturbed ground within the belland yard at Jowle Grove. Well north of the vein there is the dam of a large water storage pond. Immediately further west along the vein within the same belland yard as Jowle Grove, at Watts Grove, the hillocks are better preserved and there are various grilled/capped shafts, a ruined coe or shaft wall, a water storage pond and a gin circle. Going west, to the veins known as White Rakes, there is a belland yard around Smiler Mine with capped adjacent engine and climbing shafts, opencuts, a fine example of walling supporting deads in the vein, water storage/ore-dressing ponds and pits and a probable buddle dam. Further belland yards along White Rakes, now planted with trees, have shafts, a ruined coe, possible ponds and a probable gin circle. Nearby is a probable mine road. Opencuts are associated with early hillock reworking, possibly in the 19th century. There is a fine gin circle at Hurdlow End in a belland yard and further east there are reworked high hillocks at a second mine within a further belland yard.

10: **Coalpithole Rake** - The surface interest to the east includes extensive hillocks, a long opencut, several small dressing floors, two probable gin circles, a set of slime ponds and a probable large water storage pond (or dew pond). Near the eastern end of the vein is a manager's house that is still occupied. The central section of the vein lies within a belland yard. Underground interest includes several deep shafts (rarely entered and now potentially unstable) that give access to unstable stopes. West of the road there are two particularly impressive lined engine shafts sunk through shale (nos. 8 and 10). At shaft 8, adjacent to the road, there are slight traces of the horizontal engine house and/or associated buildings, including large gritstone blocks with securing bolts. Nearby is a large dam and leat which may be the reservoir for 18th century waterwheel pumps or was constructed as a flood-control measure in the 1860s. At shaft 10 (the westernmost) there are traces of the brick foundations and paving of an engine house or boiler house, together with a brick-built flue running up the hillside to a chimney base.

11: **Gautries Rake** - Surface interest within a long belland yard plantation includes undisturbed hillocks, several capped shafts, opencuts, water storage and ore-dressing ponds, two buddle dams, dressing floors and traces of small buildings. Rarer features include the only known stone-lined buddle in the northern part of the orefield, a 19th century mine road, and a retained tramway with

a loading bay at the top end probably associated with relatively early hillock reworking and removal.

12: **Oxlow and Daisy Rakes** - Here there are fine examples of large hillocks and opencuts. Some of the hillocks are flat-topped and have been used as dressing floors. Adjacent hillocks often comprise dressing waste. The whole is walled out by five large linear belland yards. A series of mines can be identified from the distribution of larger hillocks within the yards. Few shafts and associated features remain visible, with only two or three capped examples of shafts surviving. There are several examples of ruined coes including a large one that may have been part of a larger complex. Associated with the identified mines are water leats, storage and ore-dressing ponds (sometimes clustered together in integral arrangements), and buddle dams including one fine semi-circular example. Rarer features include a fine bouse team at Nether Oxlow, a circular structure of unknown purpose and slime pond relatively nearby, and footings of a possible small engine house at Oxlow End. There is a crushing circle, mostly buried, at Daisy Rake (Old Moor Mine). Many of the hillocks between those of the larger mines have been disturbed, and these provide clear examples of early reworking of probable 16th or 18th century date.

13: **Boggart Hole Vein, Hills Venture and Royal Oak Mines** - The hillocks, belland yards, dressing floors, ruined coes, part-collapsed beehive caps, and shafts at Boggart Hole Vein and Hills Venture Mine remain. In contrast, much of Royal Oak Mine within the ruined belland yard wall has been reworked. Interest includes a crushing circle and wheel at Boggart Hole Vein, a water storage (or dew) pond at Hills Venture, and a small part of the gin circle and a re-erected crushing wheel at Royal Oak Mine.

14: **Cop Rake and Starvehouse Mines** - At Cop Rake there are fine examples of opencuts with associated shafts and unusual drystone walling across the cut, with early reworked hillocks, a retained causeway across the vein, a possible water storage or ore-dressing pond, a possible gin circle and ruined coes. At Starvehouse Mines there are several good undisturbed examples of hillocks and hollows following relatively small veins. Parts of both rakes lie within belland yards. The mines at Cop Rake are documented as active in the first half of the 13th century.

15: **Moss Rake West End** - Fine examples of hillocks (with partial fluorspar reworking at centre) and opencuts, with shafts and water storage and/or ore-dressing pond, together with a fine slime pond, a robbed crushing circle and a ruined building, presumably a coe. The eastern part of the site lies within two belland yards.

16: **Moss Rake, Raddlepits, Hugh Grove and Rakehead Mines, and New Rake Bottom** - This section of Moss Rake has been extensively reworked but there are still features of interest. Two large modern opencast quarries are currently open that have exposed vein cheeks that contain fine examples of sweeping pickwork and stemple holes. There is also part of a 20th century inclined level. A small 20th century headgear has recently been moved but is still on site. The Raddlepits engine shaft gives access to a fine example of a rake vein mine with unusual features such as a miners' spiral staircase. Nearby a small side vein still has surviving hillocks and a climbing shaft. Further west the Hugh Grove and Rakehead shafts are currently capped, one with a large boulder, but previous exploration showed they lead to extensive rake workings. On the side vein at New Rake Bottom there is a short surviving stretch of hillocks and fine narrow opencuts, in part very deep, with one section that may be a natural pothole. There is a small walled dressing floor, with an ore storage bin in one corner and a ramp to a dressing or buddling area. There is a water storage pond nearby to the north-east and a ginged climbing shaft (blocked) to the west. Further west there is a ruined coe with internal climbing shaft. Nearby there is a dished hillock that may be a buddle dam.

17: **New Venture West End** - Good example of a small-sized vein with hillocks and opencuts. In the eastern part there are three distinct small mines, each with a ruined coe. Two have surviving shafts. One has a ruined belland yard with two dressing floor compartments, one presumably for washing and sieving, the other perhaps for buddling.

18: **New Venture Mine** - A length of damaged hillocks in two adjoining belland yards, with conserved opencuts and grilled shafts. There is also a fine wall of deads across the vein, together with a dressing floor, a possible ore storage bin (restored), water storage and ore-dressing ponds, and a natural pothole on the vein. Shafts and opencuts give access to underground stopes that reach a depth of about 70m.

19: **Long Rake Founder and Shack Pit** - Hillocks mostly removed but still with ecological interest. A lidded shaft in a disturbed hillock gives access to deep and extensive stopes and natural caverns, which reach a total depth of 150m. Shack Pit, about 30m along the vein to the south-west and now more commonly known as Batham Pot, is an impressive natural 15m deep pothole with mining at one end, once much deeper but used by miners to dump deads.

20: **Smalldale Mines** - Three isolated hillocks in a largely reworked area where the primary interest is ecological.

21: **Moss Rake - Southfield Mines** - Modern waste heaps where the primary interest is ecological.

22: **Lambpart Vein** - Hillocks and one part-filled small shaft within and adjacent to a belland yard, where the primary interest is ecological.

23: **Berrystall and Scrin Rakes, and Chance Mine** - An area with much reworking, but with some remaining hillocks, where the primary interest is ecological. One vein opencut has a shaft with an adjacent example of walling across the vein and an entrance into the shaft side.

24: **Lambpart Mines** - Hillocks and two small filled shafts, one with an adjacent small circular platform with drystone retaining and possible ruined coe, where the primary interest is ecological.

25: **Earl and Hill Rakes, and Nall Hole Mine** - Much of this vein, within a fine series of belland yards, has been reworked and the primary interest is ecological. However, at Nall Hole Mine, worked for calamine, there are large hillocks, small ore-dressing pits and a possible gin circle wall. Elsewhere there are opencuts and ponds. At the east end of Hill Rake there are three large shaft hillocks with three buildings used for agricultural purposes. However, of the two on the central hillock, one may be a converted Newcomen engine house that is known to have stood here or nearby, and the other may have been a coe. The two belland yards to the west end of Hill Rake have recently been largely removed.

26: **Intake Dale Mine and Shuttle Rake** - Hillocks, mostly disturbed or removed, where the primary interest is ecological. Part of a gin circle survives.

27: **Edge Rake Mine** - Two large flat-topped hillocks (and others nearby) with several capped and blocked shafts, mostly within a belland yard. Features include two probable damaged gin circles, a possible crushing circle, a water storage pond, foundations of a small horizontal engine/boiler house with the base of a circular chimney, a ruined coe and a possible ore-dressing site with four small rectangular pits.

28: **Maiden Rake - Heath Bush Mine** - A large flat-topped hillock with a good example of a gin circle and an adjacent capped shaft. Nearby there is a possible large coe (or agricultural building) and a second large hillock.

29: **Maiden Rake** - Four spaced shaft hillocks (and a further hillock) to the south and a reworked area to the north, all within a belland yard, where the primary interest is ecological.

30: **Tideslow, High and Washers Rakes** - There are fine examples of hillocks (with early reworking of spoil and buddling waste) within belland yards, and large opencuts on Tideslow Rake. Here there are run-in shafts, damaged dressing floors, water storage and ore-dressing ponds, and leats. The water management features are particularly complex and informative with regard to the use and re-use of surface water. There is also an unusual earth-built coe with internal capped shaft, and elsewhere there is an unusual tramway cutting leading from the vein. On High Rake there are largely reworked but still sometimes high hillocks. Amongst these, at High Rake Mine, there are the footings of two engine houses and attached boiler houses, with flues, chimneys and a reservoir (a Cornish pumping engine and a two storey winder), together with a cobbled coal yard, a crushing wheel and the site of an iron crushing track with ruined side pavement, a capstan/large gin circle, footings of a smithy/carpenters' shop and a mine office, and a large oval engine shaft with gritstone and limestone lining (capped but with viewing window). This site is currently being excavated and conserved. To the north there are good examples of hillocks and hollows on several veins, including Washers Rake, which are of ecological interest. The High Rake shaft, which is 220m deep, is noteworthy for the fine gritstone ashlar lining where it passes through toadstone at depth, which is still visible in the section just above the summer water level (about 100m down). The mines at Tideslow are documented as active from the 13th century onwards.

31: **Old Grove Sough** - This early 18th century shale gate/pumpway is not accessible and the tail is blocked. However, there is a rare and well-preserved line of eight closely-spaced ventilation shaft mounds leading north to Foolow Edge, where the vein hillocks have been heavily reworked and thus are excluded here.

32: **Little Pasture Mine** - A relatively intact moderate-sized mine complex within a belland yard. There are two shafts on shale hillocks. The main one has a gin circle and was presumably also a dressing floor. On a lower terrace there is a crushing wheel and a sunken circular crushing area, now only partly defined with no surface sign of the crushing track. Nearby to the east is a well preserved mine reckoning house (used as a field barn). Below the crushing circle there is a further terrace with a short stretch of retaining wall which may be a third ore-dressing area. It is approached from the north-west by a terraced track. Further to the north-west there are 2-4 hollows that may be water storage ponds. Downslope from the mine complex there are remains of a large but heavily reworked waste hillock.

33: **New Engine Mine** - A horizontal pumping/winding engine house in good condition with a ruined boiler house and chimney base. Very deep capped shaft through shale (333m - the deepest recorded in the orefield). Hillock largely reworked but of ecological interest. This lies within a belland yard built after the site was abandoned.

34: **Magclough Sough and Engine** - A low sough bolt leading to one of the major soughs of the region. Above there are five ventilation shaft hillocks, including a massive hillock at Magclough Engine to the west.

35: **Glebe Mine** - While the main surface interest is ecological, on large 20th century buddle dams/waste heaps, below there is a fine grilled 19th century engine shaft, down through shale to 20th century and earlier workings, and extensive concrete platforms at the site of the large 20th century dressing plant.

- 36: **Little Brookhead Mine** - An intact small mine complex on a steep shale/gritstone slope. An upper terraced working floor has a capped shaft and a gin circle. A rectangular adjacent area, terraced into the slope, may be the site of a wooden coe and there is an adjacent possible washing pit. Above and to one side is a possible pond. There is also a lower terraced area that must also have been used for dressing. A gully with pit at one end may have been associated with buddling. A large partially-robbed hillock on the slope below contains finely-crushed processed material and shale from shaft sinking.
- 37: **Stoke Old Engines** - A large flat-topped hillock with two engine shafts, one covered with a beehive cap, the other walled round. To one side is a semicircular terrace that may well be the site of a gin engine. These deep 18th century shafts were sunk through gritstone and shale to Stoke Sough, which in turn led to the veins in underlying limestone to the west.
- 38: **Stoke Sough** - An arched sough entered via a short bolt entrance and leading to one of the major soughs of the region; a long section is open, but contains bad air. Above there are two large ventilation shaft hillocks.
- 39: **Watergrove Mine** - Hillocks on the south side of road are well preserved but to the north they have been disturbed. Features to the north include a mine office and smithy, both still roofed, a semi-detached overseer's house and manager's house (still occupied). Across the road are the probable foundations of a Newcomen pumping engine house next to a capped shaft. Nearby, but lower down the slope, there is a large reservoir (uncertain purpose). On the north side of the road is a second smaller reservoir, presumably for the 19th century Cornish engine house that has now been removed. The main engine shaft here is covered and used for a water supply for Cavendish Mill. There are three beehive shaft caps to the east (restored). The large one to the south of the road has a flat adjacent area large enough for a gin and was probably an engine shaft. The other two are adjacent to each other on the other side of the road, comprising a large engine shaft cap and a small climbing shaft cap. All these features lie within a series of belland yards. Beyond to the north-east there are further hillocks, all rather damaged, but there are deep shafts, two with beehive caps, down to the pipeworkings and this area is an integral part of this historically important mine complex.
- 40: **Arbourseats Veins and Sough, Wardlow Sough, and Nay Green Mine and Washing Floors** - Good example of small to moderate sized veins with hillocks and opencuts (some deep), with several small belland yards, ruined coes, levels and sleepered shafts. At the top of Tansley Dale there is a gin circle wall adjacent to a run-in shaft, with a coe built later overlying the horse walk. A small belland yard part-way down Tansley Dale has a flat-topped dressing floor hillock with ruined coe, a grilled but blocked shaft, a water storage pond, and a possible small rectangular ore-dressing pit. In the main valley bottom there are rare large Nay Green ore washing ponds fed by a stone-lined goit from Wardlow Sough (currently blocked). Nearby is Nay Green (Neptune) Mine where there is a long accessible level with internal shafts to depth. On the other side of the valley there is a run-in sough tail and opencuts above, leading to the sough, following the main Arbourseats Vein. The spoil from these workings part-blocks the valley bottom and creates a dam for the washing ponds. Near the bottom of Tansley Dale there is a drystone walled channel on the top of a large flat-topped dressing floor hillock. This leads to an underground level (or perhaps sough) with an internal shaft down to unstable workings.
- 41: **White Rake (west)** - A good example of large hillocks and hollows. In a possible belland yard to the east the opencut is continuous. To

the west a larger hillock has hollows that may well be the sites of engine and climbing shafts.

- 42: **White Rake (east) and Old Seedlow Mine** - Interest includes hillocks, opencuts, shafts and a ruined belland yard. At Old Seedlow Mine to the east, within a large belland yard, there is a fine ginged engine shaft, one or possibly two ruined coes, two slime ponds, a water storage pond with leat and a poorly defined possible gin circle. Further east there is a shaft with a walled gin circle. Both these mines had large waste hillocks that have been extensively reworked. Further west the hillocks are largely intact and there is a fine rectangular buddle dam.
- 43: **Mootlow and Robinwash Veins** - The eastern part of this area has impressive large hillocks and opencuts. Features include a small mine complex with large hillock, ruined coe, small buddle dam and an access track. At the upslope end of the site is a modern pond (which may be a re-used mine feature) and leat, with two possible mine water storage or ore-dressing ponds nearby. The western part of the area has been extensively reworked for gangue mineral leaving deep opencuts and hillocks that are a good example of remains left by early to mid 20th century working. Surface interest here includes ruined footings of a calcite processing plant with buildings, small dressing floor, loading platform, access tracks and a chimney flue with the base of a small circular chimney. The whole lies within a belland yard.
- 44: **Cackle Mackle Mine, Blakeden Great Vein and Stadford Hollow** - Surface interest includes extensive hillocks and hollows along moderate-sized veins, mostly partially robbed, capped shafts and several ruined coes. Features include a well-preserved hillock-top gin circle with robbed surrounding wall at Cackle Mackle Mine, with a possible stone-lined buddle on an adjacent hillock, and a small walled dressing floor, coe and water storage or ore-dressing pond on the vein to the south. Underground, there are good examples at Stadford Hollow of short cross-cuts linking the bases of climbing shafts with the tops of the next in sequence, together forming a ladderway going deep underground.
- 45: **Silver Hillocks Mine** - The main interest comprises a coe with a possible large knockstone in the corner (or the top of a crude table/shelf). Nearby are the incomplete footings of one or perhaps two more coes and a small area of intact hillocks and hollows. To the north there is a further coe with a blocked internal shaft. The surrounding hillocks have been extensively reworked.
- 46: **Enterprise and Shepherds Mines, Sallet Hole, Unwin Vein and Talbot Holes** - At Enterprise Mine there is a bank of two bouse teams and a water storage pond (probably remodelled) with a feeder leat. Nearby there is an enterable trial level (and the site of a second arched example opposite). Elsewhere in the area the hillocks of relatively small veins are well preserved, with some opencuts and levels, and a ruined coe in the valley bottom at Shepherds Mine. A natural cave on the vein to the west leads to mine workings with a deep internal shaft. At Sallet Hole Mine below, at valley-bottom level, the 20th century level survives and is gated, but the buildings of this now disused fluorspar mine have recently been removed.
- 47: **Cat Rake** - A good example of a deep but narrow opencut along a vein; hillocks within the belland yard were largely removed in the 20th century. This site may have been at work in the 1570s, then known as Catsall Rake, when waste material was being reworked using sieves and vats, the earliest documented example of this practice in the orefield.
- 48: **Red Rake Mine and Newburgh Level** - The main remaining interest is the fine drystone arched Newburgh Level, with an 1851 datestone, that was used for haulage rather than being a sough despite being commonly called Red Rake Sough. There is

- also a roofless stone building that was part of the mine complex. Extensive associated hillocks and other features have been reworked/removed.
- 49: **Brightside and Harrybecca Mines** - Surface interest includes extensive damaged hillocks, capped shafts and levels. At Brightside Mine there is a rare bank of three bouse teams, an arched haulage level called the Newcastle Road, the footings of a horizontal pumping/winding engine with chimney base, and a ruined sawmill (powered by the engine house). A mine cottage is still inhabited. At Harrybecca Mine there are deep opencuts, an overgrown gin circle and ruined buildings. There is also an interesting small 20th century fluorspar mine plant nearby to the west (Bacon's Mine), associated with one of the deep opencuts, with levels, platforms and ore chute drystone supports, and once with corrugated-iron structures (recently collapsed). The opencuts can be explored underground (but are very unstable in parts) and are a good example of narrow vein workings. A sleepered shaft gives access to a series of pipe-like workings and the main engine shaft. To the east a small level gives access to the side of a large engine shaft. At the latter, above at surface, there is a second gin circle cut into the hillside, now overgrown and boulder strewn. Nearby is the bed of a steep incline which is presumably associated with fluorspar working. Against the northern boundary of Hassop Common there is a series of initialled meerstones marking the boundary between Hassop and Ashford Liberties.
- 50: **Putwell Hill Mine** - The vein has been extensively worked for calcite in the late 19th and first half of the 20th century, but was earlier mined for lead. Interest includes ruined 19th and 20th century buildings, the lower half of a chimney and impressive underground stopes. At surface there are ruined buildings on two sites. The lower site has two small buildings, with the chimney between, and stone retained working platforms. Upslope from here there is a wide opencut. The upper site, which is earlier and not certainly a mine complex but more probably agricultural, has two small ranges of buildings set at right angles. Nearby, and running across the hilltop, there are well-preserved hillocks and an opencut.
- 51: **Lees and Dove Rakes, Booth Lee Pipes, and Sterndale Sough** - Surface interest includes well-preserved hillocks in a fine setting, capped and run-in shafts, opencuts, water storage and/or ore-dressing ponds and belland yards. Other features include a fine walled ore washing pond, and a run-in high-level sough tail and associated ventilation shaft mounds. There are two belland yards with important associated features. One has a bouse team and barrow-run, a meerstone, ore-dressing ponds and a ruined building presumably a large coe. Further east, the other yard has water storage and/or ore-dressing ponds and possible buddling troughs, with water channels from a spring high on the hillside above, and buddle dams below in the lower part of the belland yard. Small underground workings are accessible at Booth Lee Pipes, some possibly of considerable age. To the north-east, by the Wye, there is the run in sough tail of Sterndale Sough, with an adjacent coe and flat-topped hillock. To the south-east, on the hilltop, there are hillocks at a rare example of an outcropping flatwork worked in the 17th century.
- 52: **Maury Mine and Sough** - Surface interest includes well-preserved hillocks, opencuts, capped shafts, ruined coes, dressing floors, water storage and/or ore-dressing ponds, buddle dams and belland yards. Features south-west of the hilltop include a fine walled gin circle, associated capped shafts, ruined coes and a small ore bin or the surround to a knockstone. Further south-west are capped shafts and ruined coes, some within a belland yard. On the hilltop to the north-east there is an unusual hillock-reprocessing site of probable 19th century date with large waste heaps, buddle dam and a possible buddling trough. On the slope down to the Wye there are further possible ore-dressing pits, opencuts, a water

storage and/or ore-dressing pond and a belland yard. Near the base of the slope there is a fine site comprising a run-in haulage level with associated tramway bed, large hillocks, dressing floor, a ruined coe, buddle dams and a ruined belland yard wall. A shaft at the base of the riverside cliff gives access to Maury Sough, which runs up the vein through several stopes with fine packs of deads. At the sough tail below there is a ruined coe.

- 53: **Bulltor Veins** - A broad swathe of hillocks and hollows on several veins within a belland yard, where the primary interest is ecological. There has been some reworking, particularly to the east.
- 54: **Grove Rake** - Good example of hillocks and opencuts along a relatively large vein in a long belland yard.
- 55: **Upper Hubbardale Pipe - Water Engine Shaft** - The hillocks here are in variable condition. The main point of interest is a water leat that may be associated with run-off water from a documented underground 'water engine'. It has been suggested that the shaft had a cog and rung gin engine but the evidence on the ground for this is ambiguous.
- 56: **Hubbardale Pipe - Fidler's Shaft** - A large hillock with a ruined belland yard wall contains two capped shafts, one a climbing shaft, the other an engine shaft with a well-preserved gin circle to the side.
- 57: **Sheaths Pipe** - A fine example of well-preserved hillocks, within a belland yard, associated with an outcropping pipe rather than a rake. Features include a blocked shaft and a possible ruined coe.
- 58: **Crotie Rake** - A fine example of well preserved hillocks related to a swarm of small veins. There are also several small capped shafts.
- 59: **Whale Rake** - A good example of rake hillocks of variable size. There is a poorly defined gin circle on a particularly large hillock.
- 60: **Whale Sough** - An historically important sough to the Hubbardale Pipes with a good example of a slabbed bolt with six shaft hillocks. Underground the sough is accessible for some distance to a fall, now enterable via a reopened shaft in a hillock near the tail.
- 61: **Shake Rope and Sun Veins** - Well-preserved examples of isolated small veins with shallow opencuts and small upcast heaps with occasional shafts.
- 62: **Fieldgrove Vein** - The hillocks and shafts are in somewhat variable condition. Features include two mine complexes with large hillocks in belland yards. Both have engine shafts with well-preserved walled gin circles and large coes; the one to the north-west has two storeys with a fireplace and chimney flue. The mine to the south-east also has a flat hillock-top dressing floor, a stone-lined, rectangular, water storage pond and a possible slime pond.
- 63: **Hard and Glead Rakes, and High Low Mines** - A fine example of rake and multiple veins with hillocks, opencuts, run-in shafts and small belland yards. In one part there is an exceptional area of seven small belland yards and possible collapsed beehive shaft caps. There was also once a Newcomen engine house and sub-surface evidence may remain. The hillock here contains cinders. Hard Rake Mine, in the plantation, has a capped engine shaft with an adjacent walled gin circle and dressing floor, all on a high flat-topped hillock. Further west there is a ruined building which may have been a mine reckoning house.
- 64: **Magpie and Dirty Redsoil Mines, and Talbot Holes** - This exceptional site, with the core area within a belland yard, has fine hillocks and a complex suite of 19th century buildings. These include a Cornish engine house, a miners' dry, a horizontal engine house and boiler house, two chimneys (one from an earlier Cornish winding house) and flues, a reservoir, a small horizontal engine house (used for dressing floor equipment), a manager's house with

attached smithy, a small building that may have been an ore store, and a powder house. There is also a 20th century headgear and winding house. Elsewhere on site there are also several grided climbing and engine shafts, four gin circles (one walled, the others embanked on flat-topped dressing floor hillocks), an embanked leat for the water pumped from underground, a raised tramway and slime ponds. There are also shallow re-working opencuts, a dressing floor with ruined wall, a small buddle dam, ruined coes, one or two limekilns and associated quarries for constructing the buildings, and the site of a possible damaged crushing circle (unlikely). Many of the hillocks were partially re-worked in the 19th century and there are associated small ore-dressing pits with a complex series of small leats. The main engine shaft is open to sough level but contains dangerous obstructions. Other shafts give access to short sections of vein workings. To the west, around Talbot Holes, there are good hillocks on several veins.

65: **Trueblue Mine** - This small mine site within a belland yard includes hillocks and hollows across much of the field, a capped shaft, a walled gin circle, ruins of an exceptional group of four to six coes, one with a possible collapsed climbing shaft, a dressing floor, a very large dew or water storage pond, a possible stone-lined buddle and possible ore-dressing ponds and pits. An adjacent two-storey building is presumably a field barn.

66: **Great Greensward Mine** - The hillocks are mostly removed. A lidded oval engine shaft, at one side of a disturbed platform/hillock, has rare in-situ underground pumps and guide rails for a cage. Nearby at surface there is a raised stone mounting for a horizontal pumping/winding engine, erected outdoors or housed in a wooden/corrugated iron engine house. Behind this there is a ruined stone-built boiler house with attached chimney base with a firebrick lining. In the boiler house wall there is the site of a drawing door with in-situ iron guide rails. Nearby there is a grided climbing shaft with a fine example of stone climbing stemples. At the south-east end of the field there is a second engine shaft and a climbing shaft.

67: **Bagshaw Dale Mines** - Small length of vein hillocks, and ploughed-out hillocks on a second possible vein, where the primary interest is ecological.

68: **Brecks Mine** - Two small opencuts above and below the quarry, where the primary interest is ecological.

69: **Crimbo and Wharf Pipe Mines** - At surface there are several intermittent pipeworking hillocks, mostly damaged, some with capped/lidded shafts, and outcropping pipe and vein workings. The south-western end lies within a belland yard. There are two surviving gin circles and the poorly defined remains of a third with a ruined protecting wall. There are also one or possibly two ruined coes, one with a lidded climbing shaft. At one shaft hillock there is the base of a chimney and stonework/brickwork at the site of two demolished horizontal steam engine houses. The extensive underground features (now often known as Hillocks and Knotlow Mines) include pipe and vein workings, hand picked climbing shafts and larger engine shafts, and several fine examples of coffin levels and later access levels. Hillocks Mine has evidence for firesetting in its upper workings.

70: **Hutmoor Butts Mines** - A rare survival of a number of intact workings on several small closely-spaced veins with capped small shafts, one or two ruined coes, and what may well be a rectangular ore washing pond with a semicircular end.

71: **Ferndale Mines** - Small length of vein hillocks where the primary interest is ecological.

72: **Pasture/Hole Rake** - Vein hillocks and a water storage or ore-dressing pond, where the primary interest is ecological.

73: **Tagg Lane Mines** - Hillocks on small veins, with two capped shafts, where the primary interest is ecological.

74: **Sparklow Mines** - A good example of well-preserved hillocks on four small veins where the primary interest is ecological.

75: **Cotesfield Mine** - A part-removed belland yard wall contains a gin circle with adjacent capped engine shaft. Adjacent mining within the vein took place as least as early as the 12th century as this vein is mentioned as an 'old mine' in a charter of this date.

76: **Carder Low Mines** - A well preserved line of vein hillocks, except at the centre where there is a mine complex on a hillock, with the vein hillocks removed to either side for reprocessing at this site. Here there is a sleepered shaft with an adjacent gin circle with a ruined surrounding wall. The circle is partly overlain by the ruined walls of a large rectangular building, presumably a coe. A short water channel, with small adjacent platform, leads to two ore-dressing ponds at the downslope end of the hillock.

77: **Mandale Rake** - This is the only surviving stretch of large hillocks and hollows on this historically important rake. There is also a well-preserved 1820s mine reckoning house. Mandale Rake is documented as active in the 1280s and the late 16th century.

78: **Mandale and Lathkill Dale Mines and Soughs** - The surface features at Mandale Mine include a ruined Cornish pumping engine house, flue and chimney. Nearby there is the goit and entrance to Mandale Sough, a waterwheel pit, blocked shafts and a gated entrance to an inclined level into the mine. Further up the valley there is a long waterwheel leat, the pillars of an aqueduct over the river, and the wall of a second waterwheel pit with launder breast wall at Lathkill Dale Mine. Other features here include capped shafts and the ruins of Bateman's House (a manager's house with large accessible shaft beneath it, with a chamber at the base which one had a rare Dakeyne disc engine), and a ruined powder house. Elsewhere there are level entrances. Underground features include Mandale Sough that in part is arched or slabbed-over, together with stopes and a chamber at the base of an engine shaft. A gated side vein has evidence for firesetting. Sideway Level, with stopes and shaft, is also accessible further up the valley. Part of Lathkill Dale Sough is accessible in drought conditions via the shaft at Bateman's House. Mandale Mine is documented as active in the 1280s and the late 16th century; most of the surface features are 19th century in date.

79: **Summerhill Mines** - Hillocks on veins, with capped shafts, a belland yard and dressing floor (with a flat area that possibly once had a gin), where the primary interest is ecological.

80: **One Ash Moor Mines and Water Icicle Close Mine** - Hillocks on veins, with several capped shafts, where the primary interest is ecological. At the northern edge of the area is a rare survival of a line of four beehive caps over small shafts. The shaft at Water Icicle Close Mine leads to natural passages where miners have removed stalagmites (thought to be for incorporation into a grotto at Chatsworth) and to a good example of narrow vein workings.

81: **Long Rake Opencuts** - Wide opencuts and disturbed hillocks within a long belland yard. One deep opencut leads to extensive underground stopes worked for calcite in the 19th and 20th centuries. Here unstable workings include large stopes, ring-arched levels with tramways, timber ore chutes, and an engine shaft with fittings and ladderways. There are also reworked hillocks and two temporarily open shafts (which in spring 2003 appeared to be being prepared for backfilling). Recent infilling of the western opencuts has necessitated exclusion of this part of the site, which was included when the Inventory was formulated in 1999/2000.

82: **Bradford Dale Mines** - Hillocks along veins where the primary interest is ecological. In the valley bottom is a large hillock with capped shaft and probable slime ponds. There are also two trial workings in the cliffs on natural joints.

83: **Blith Forefield Mine** - Reworked and largely removed hillocks and a capped shaft, within a belland yard, where the primary interest is ecological. A ruined two-storey building may be a mine building, perhaps a mine office or reckoning house.

84: **Thornhill's Sough and Bowers Rake** - A good example of five closely-spaced ventilation shaft hillocks following a short sough to Bowers Rake.

85: **Hillcarr Sough** - Fine arched entrance tunnel to one of the longest soughs in the orefield. There is also a jetty where material from the sough was unloaded from boats and placed in nearby waste heaps. A goit leads via two ponds to the River Derwent. Nearby there is a limekiln that may be associated with the sough. In the other direction, a paved track leads upslope to three ventilation shaft hillocks. The uppermost has a capped shaft with an adjacent platform (possibly for a gin) and a nearby enclosed yard.

86: **Mouldridge Mine** - Surface features include well-preserved pipe-working hillocks, capped shafts, a dressing floor and a belland yard. A level leads to a good example of a complex series of underground pipe workings with shafts to surface, two of which are unusually close together, a dressing floor, fine walled packs of deads and an internal shaft.

87: **Dunnington and Hardbeat Mines, Rath and Cowlica Rakes, and Rath Rake Sough** - Extensive well-preserved pipe and vein working hillocks and opencuts, with a number of capped shafts. In places there are large opencast-type workings, presumably in pipes or flats, and one area has a large number of near-contiguous shaft hillocks, which suggest flat or pipe works were mined below surface in 'bell-pit' fashion; exploration of one open shaft here supports this interpretation. Surface features include several buddle dams (some large) associated with 19th century hillock reworking, one with two barrow runs, several ore-dressing pits, a possible pond, two water leats or trunk buddles, three probable/possible gin circles, a ruined circular coe or walled shaft and two mine (or agricultural) buildings on Rath Rake which are presumably large coes. A line of hillocks follows a vein on the line of Rath Rake Sough; some of these hillocks may well also be the sites of ventilation shafts. The sough tail is a low slabbed sough tail bolt, the oldest of its type still open. There has been no recorded underground exploration of the main part of the historically important and extensive Dunnington pipe workings.

88: **Rainslow Scrins** - Extensive opencuts on closely-spaced veins but with many areas reworked and the hillocks disturbed or removed, with several capped shafts, three buddle dams (one very large), a trunk buddle or water leat, a walled shaft and possible ruined coes.

89: **Portaway Mine** - Disturbed hillocks where the primary interest is ecological. A capped engine shaft in a large hillock may give access to the known extensive pipe and vein workings (see U14, U15).

90: **Yatestoop Mine** - A series of exceptionally large hillocks with engine shafts to Yatestoop Pipe, two of which are still open. Surface interest includes two possible gin circles (one suggested only on the basis of a large flat-topped hillock at the top shaft where a steam engine was installed underground), and ruins of a small building that may be a mine coe or an agricultural building. Exceptionally, there were five or six Newcomen pumping engines at surface, including the earliest in the orefield. No surface traces of their engine houses have been recognised but in most cases the sites look relatively undisturbed and excavation may reveal

footings, etc. Documented extensive underground pipe workings may well be of great interest but large parts are not accessible (character of accessible workings currently poorly documented).

91: **Brown Edge, White Great Rake and Lickpeny Mines** - Extensive hillocks on pipes and veins, with many ploughed-over or removed, but with intact examples and several shafts. The remains include six fine examples of buddle dams, a water leat from a shaft to buddle dams, a well-preserved stone-lined water channel from shaft to stone-lined buddle, and two or possibly three gin circles including a good example on a flat-topped hillock.

92: **Hadland and Delf Veins** - A small number of hillocks where the primary interest is ecological. A part-robbed hillock to the south-west with capped shaft has an adjacent platform that has a possible poorly defined gin circle.

93: **Winster Pitts, Drummers Venture, Horsebuttocks and Burning Drake Mines** - Well preserved hillocks and dressing floors at a series of adjacent mines. Surface features at Winster Pitts and Drummers Venture include exceptional survival of various types of buddles, including leats or trunk buddles, stone lined buddles, ore-dressing pits, ponds and buddle dams. There is also a gin circle and ruined coe. Shafts lead to underground workings at Winster Pitts, Horsebuttocks/Burning Drake Mines; the latter are extensive and include important pipe workings and drainage levels which extend well to the north of the main access shaft (where there were further access shafts). Taken together, in these mines there are underground mine artefacts, inscriptions, a coffin level, railed levels, dressing floors with a buddle, a hotch and clay-lined leats.

94: **Longtor Mines** - Broad area of hillocks and opencuts on closely spaced veins, much reworked in the past, with several important features. These include small capped shafts and opencuts, and three large engine shafts, two of which are visible through grills and are fine examples of oval ginged shafts. One has a possible leat leading from it. A large hillock at the north-western end of the defined area has a possible gin circle. There is also a stone-lined buddle, a ruined coe and several large buddle dams.

95: **Limekiln Veins** - Relatively small hillocks, one with an adjacent gin circle cut into the slope.

96: **Bithoms Veins, Innocent Mines, and Weet Sough** - An extensive area of surviving hillocks, associated with a series of pipe and vein workings, overlying medieval strip lynchets. There are a small number of capped shafts, several buddle dams, two possible ruined coes and ventilation shaft mounds on the line of Weet Sough. Stone beehive caps on a large number of shafts have been removed in recent years. The underground workings are known to have been extensive but there has been no known modern exploration.

97: **Waterings Close and Shakersdale Mines** - Surviving hillocks on several close parallel veins, with several capped shafts, including two with beehive caps, at least one ruined coe, two or possibly three stone-lined buddles, one or possibly two buddle dams, a barrow-run or raised launder, the foundations of a reckoning house, and the footings of what may have been a ventilation fire house (the only known surviving example in the orefield).

98: **Davis and Mount Pleasant Mines, and Basrobin Sough** - Surface remains comprising hillocks along numerous small pipe and vein workings, many still relatively intact within the area defined. There are many capped shafts, opencuts (some from 19th century reworking), a small hillock-top gin circle with visible slots for the gin engine supports, two barrow-runs or raised launders, stone-lined leats or trunk buddles, and buddle dams (some very large and including two fine banked sets). One long leat links a shaft to buddle dams. Basrobin Sough has a walled 'well' enclosure at

the entrance to the slabbed level. The Mount Pleasant and Davis Mines are not documented as having been explored in recent times but may well be important. Basrobin Sough can be followed for some distance underground. The site as a whole has extensive surface evidence for the relative age of mining, medieval strip lynchets/ridge and furrow and Romano-British settlements.

- 99: **Old Ash, Lords and Ladies, Hit and Miss, and Tearsall Mines, and Snitterton Park Fire Engine** - Surface remains comprising fine examples of hillocks along numerous small veins and pipe/flat workings, many still relatively intact. There are many capped shafts, some with dressing floors. The Tearsall engine shaft remains with an adjacent coe, while at the nearby Hit and Miss Mine there are ore-dressing features, including small pits on a series of flat platforms, a ruined rectangular coe nearby, and a circular example above. The gin circle at Dalefield Mine has recently been removed. Above Northern Dale at the Old Ash Mines there is a stone-lined buddle, with another further north, and the probable foundations of a Newcomen pumping engine house, with cinders, etc, known as the Snitterton Park Fire Engine. In waste tips at the base of the hillside there are hillocks associated with at least two soughs that sometimes still issue water. The underground workings in Northern Dale, at Old Ash Mine and the adjacent Lords and Ladies Mine, are particularly important as rare examples of demonstrably early workings with evidence for firesetting with coal and 'woodpecker' pickwork, and also with fine packs of deads, sledways, water channels and ventilation walls. The flattings mined at Lords and Ladies Mine outcrop on the dale side and have been mined at surface to the south. The Hit and Miss Mine (Tearsall Pipe Caverns no. 2) pipe workings are also important as examples of complex small workings, some probably early, with a large number of small shafts from surface. Mines somewhere at Northern Dale and Tearsall are documented as active in the 1530s and 1540s respectively. The site as a whole has extensive surface evidence for the relative age of mining and medieval strip lynchets/ridge and furrow.
- 100: **Oxclose, Lee Wood, Lee Close, Ash Plantation and Noon Nick Mines, Crowholt Level and Lee Close/White Hillocks Sough** - Many scattered hillocks with shafts, mostly to pipe workings, some partially reworked others intact. Surface features at Ash Plantation include a buddling complex, with a long leat from a shaft above, a stone-lined buddle at the base with adjacent ruined walls of a possible coe and/or small yards, and a high hillock and buddle dam below. Below there is another stone-lined buddle and a small buddle dam. Further east there is a ruined coe with a cupboard in one wall. At the Lee Close Mines there is a ruined coe and a water storage or ore-dressing pond with an associated tramway and buddle dam. Below the Lee Close Mines there is the open tail of Lee Close/White Hillocks Sough and a possible lower collapsed sough and/or haulage level tail, associated with a fine large coe with wall cupboard, and a large partially reworked hillock with associated buddle dams below. At the Oxclose Mines there are the lower walls of a Newcomen engine house and a nearby cinder heap. At the Lee Wood Mines and nearby veins there is a stone-lined buddle, a possible gin circle and a ruined coe. At Noon Nick (Jug Holes) there is an impressive open pipe-cavern entrance. At surface there is a water storage pond, a tramway-cutting to a 19th century level entrance (now altered), and platforms associated with a 20th century inclined tramway. Underground features at Oxclose Mine include extensive pipe workings, a fine coffin level sough known as the Crowholt Level, and a 20th century inclined tramway. There are many inscriptions, the earliest dating to 1623. The Lee Wood pipe workings are also known to be potentially of great interest but are currently poorly documented. Noon Nick also has a 19th century arched level and a 20th century flourspar-extraction tramway and tubs. It also has a 17th century inscription in the roof

of one chamber, next to a small shaft to surface, made before the chamber deposits were removed. Lee Close/White Hillocks Sough can still be followed for some distance underground and may be the earliest accessible hand-picked level in the orefield. It links with workings above and both have a variety of tramway rails. The Lee Wood Pipes are known to be accessible (character of workings is currently poorly documented). Both the Oxclose and Noon Nick Mines are documented as working in the 1530s. Noon Nick Mine has a 17th century miner's inscription in the roof of one of the chambers. The site as a whole has extensive surface evidence for the relative age of mining and medieval strip lynchets/ridge and furrow.

- 101: **Old Kennill Grove** - A small area of disturbed and part removed hillocks where the primary interest is ecological.
- 102: **Gorseydale, Hangworm, Beans and Bacon, Slack Breaks and Fiery Dragon Mines** - Extensive area of mostly well-preserved hillocks on a series of small veins and pipe workings, with many capped shafts. Surface features include several coes, including a double example, and a gin circle at Hangworm Mine and a dilapidated level entrance at Beans and Bacon Mine. Many shafts give access to good examples of small underground workings and are important for the understanding of this type of mining. A deep shaft at the northern end of Slack Breaks leads to extensive pipe workings. A western section of the Gorseydale Mines had its hillocks levelled at the time of scheduling notification (now excluded from the defined area). The eastern part of the defined area also has mostly disturbed hillocks but is still of ecological interest.
- 103: **Whitelow Mines (west)** - Well-preserved hillocks on a series of small veins with many capped shafts. In parts small workings are continuous and the lines of veins not obvious; here the mining developed on rare mineralised cellular blockwork joints in the limestone. One shaft lies on a small hillock-top dressing floor with a shelter wall and possible rectangular ore-dressing pit. A nearby hillock has a small stone-lined buddle. Another shaft has a shelter wall and a further example is walled round. There is also a possible pond. The area east of the lane has been extensively reworked but has ecological interest. The Whitelow Mines are documented as active in the 1540s.
- 104: **Whitelow Mines (east)** - This site has been extensively reworked for gangue mineral in the mid 20th century leaving large opencuts, new hillocks and access tracks. While the lead mine interest has largely been removed, the exceptions being a few small hillocks and two capped shafts, the site is one of the best surviving examples of gangue working where the site has not been subsequently landscaped. There are two abandoned cranes on site which date from this period of extraction. The Whitelow Mines are documented as active in the 1540s.
- 105: **Horsedale Mines (north-west)** - Hillocks on a series of veins where the primary interest is ecological, with capped shafts, shallow opencuts, a possible stone-lined buddle, and probable water storage and/or ore-dressing ponds.
- 106: **Horsedale Mines (south-east) and Horsedale Sough** - Well-preserved small hillocks on a series of small veins, combined with shafts on higher hillocks, some with walls to provide shelter to the small dressing floors on their flat tops. There are several capped shafts and ruined coes. There is a fine example of a small mine complex comprising a high but small hillock, with coe with internal shaft, a dressing floor embanked at its edge, and a hollow to one side that may be an ore-dressing pit. Some of the mine hillocks overlie large medieval strip lynchets. In the valley to the north-east there is a low sough bolt with strong water flow. Capped shafts nearby could potentially give access to the sough.

- 107: **Bonsall Lees Mines** - An extensive area of hillocks and hollows on many small veins and occasional pipe workings, sometimes partially reworked, occasionally leaving opencuts. There are many capped shafts, some retaining fine beehives, and ruined coes, mostly rectangular but including circular examples, sometimes associated with small dressing floors on flat hillock tops, some walled, and/or small belland yards. Two walls are circular and may have contained cog and rung gin engines. One area retains fine and densely packed examples of all these features. Other surface features include several stone-lined buddles, including one well-known restored example on the side of a hillock, the entrance to a slabbed haulage level on the valley side, and the entrance to a very small level nearby. The Bonsall Lees Mines are documented as active in the 1540s.
- 108: **Dale Mine** - Surface features above this rich pipeworking include a belland yard, approached by a mine road, containing a dressing floor, blocked shafts, a well-preserved gin circle, a range of six small rectangular 'kilns' probably for calcining zinc ore, the possible buried footings of two Cornish engine houses, a smithy and possibly an earlier Newcomen-type engine house later converted to an ore house, an adjacent quarry for their construction, and two small reservoir ponds above, presumably dug for one or more of the engines. A large waste heap in the lower part of the belland yard is mostly of limestone from shaft sinking and driving an underground pumpway level; material from dressing appears to have been removed. Below the belland yard there is a walled-round but blocked climbing shaft. In the general area there are also other shaft sites and further east a blocked upper level approached by a mine road. A low entrance near the river gives access to the long pumpway level through the upper workings. There is little to see at a second set of dressing floors, built in the 1860s on the hilltop, but the buried footings of a Cornish engine house may remain. Both dressing floors and their engines were supplied with water by a long leat from the north.
- 109: **Ecton Mines and Soughs** - This exceptional site was one of the richest copper mines in Britain in the second half of the 18th century. There are extensive hillocks, some of which are well-preserved, many capped shafts and several levels and pipe entrances. Some of the hilltop workings are of Bronze Age date and prehistoric hammer stones and a radio-carbon dated antler pick have been found. Later surface features of particular importance include a late 18th century Boulton and Watt engine house with chimney base; nearby there is the exceptionally deep engine shaft, a balance shaft on a conical stone-retained mound, an exceptionally large gin circle, a crushing wheel (moved), and a small reservoir. There are other ruined mine buildings on various sites, including those at Dutchman Level where there are the ruins of a 19th century horizontal engine house, smithy and carpenters' shop, and also a bouse team. At Waterbank Mine there are also the ruins of a 19th century horizontal engine house, smithy and carpenters' shop. There are footings of smelters in the valley bottom. On the hillside above Deep Ecton Level there is a large dressing floor with two circular buddles, a launder, the footings of a horizontal engine house, a jigs shed and work shed. Further north, there is the Mine office and saleroom, while below is the agent's house, all now used as dwellings. Elsewhere there are also belland yards, six gin circles, including a fine example cut into a cliff at Apes Tor, level/sough portals, a large dressing-water reservoir and long covered leat, mine roads, a powder house and a limekiln for burning mine waste-rock. The extensive accessible underground pipe workings are of exceptional interest. Features include shotholes for rare 17th century continental-type powder work, 17th to 19th century shafts and various soughs and levels. These include Deep Ecton Sough, that may have operated as a boat level with notches for a later plankway, and another at Apes

Tor to bring water to an underground engine in Deep Ecton Mine. Here there are engine chambers for a flop-jack engine, a large gin engine/capstan and a waterwheel. There are also stone and timber dams, tramways, ladderways, striking chambers and bundings here and in other workings. Clayton Level, with a fine portal, leads to a chamber that had a steam engine with a surviving underground engine chimney. Clayton Pipe can be entered, via an ore chute, with an impressive vertical pipe entrance at surface.

- 110: **Bincliff, Oversetts and Highfields Mines** - There are extensive surface workings above the steep daleside, mostly comprising limestone hillocks with infilled shafts, some with associated ruined coes and small walled belland yards. Highfields Mine to the south-east lies within a belland yard. Here there is an oval shaft with a well-preserved walled gin circle. A second probable gin circle within the belland yard lies next to a large ruined coe and a second smaller circular area that may be the site of a crusher. A number of underground levels are accessible, with entrances at various points down the steep heavily-overgrown valley-side, some of which enter unstable stopes that originally linked to surface. Those just above river level are 19th century in date and have large spoil heaps. One has an arched entrance (part collapsed). Three levels higher up the slope have flat-topped waste hillocks, one with two ruined coes, the others with one.

Main Sites - Outside the National Park

- 111: **High Tor Mines** - A complex series of spectacular deep opencuts (Roman and Fern Caves), mostly open to surface. This is a good example of this type of working that may be of some antiquity. There are also accessible workings of limited extent at the base of the cliff to the west and north.
- 112: **Via Gellia Mines and Soughs** - The steep slopes of the Via Gellia contain a large number of small mines. At surface the evidence largely comprises a scattering of shafts and levels with associated hillocks, some with belland yards, coes and stone-lined buddles, including a fine large coe at Jacobs Dream Mine and restored coes at Goodluck Mine. Underground workings include important pipe workings at Ball Eye Mine and Houghton Pipe (the upper Ball Eye workings from Ruggs Hall are now partly removed by quarrying). There are also small pipe workings at Hollow Phinnis to the west, and on the south side of the valley at Cow Hole. There are also important and extensive workings in small veins at Spencer's Level, Henstocks, Goodluck, Silver Eye, Cawder Slack Levels, Old Gells, Jacobs Dream, Hallicar Wood (Groaning Tor) Level, Goodluck Sough Level, Owllet Hole Gate, Slingtor Level, Yulecheese (Dunsley Springs) Level, Slaley Sough Level, Bonsall Lees Level, and Brogdale or Bald Pie (Clatterway) Mine and Sough, all of which are particularly instructive with regard to this type of mine. Features include levels, coffin levels, stopes, shafts, winzes, sledways, tramways, stone stemples and miners' inscriptions. Fountrabby Sough within the Ball Eye Mines includes fine coffin level pickwork. The Hollow Phinnis pipes and vein workings have evidence for firesetting. The Ball Eye Mines are documented as active in 1550 and are reputedly unusual for the high level of silver in the ore.
- 113: **Black Rakes, Welshmans Venture and Bondog Hole Mines, and Merry Tom and Thumper Sitch Levels** - Here there are a large number of small mines on many small veins that have survived because the hillocks are largely of limestone rather than gangue mineral. At surface there are a large number of shafts with associated hillocks, small dressing floors and ruined coes. Some shafts occur in clusters and are unusually close together. One particularly fine example of a small mine complex comprises a mound-top dressing floor with a small drawing shaft upslope, a coe with an attached circular wall that presumably contains a blocked

climbing shaft to one side, and a stone-lined buddle downslope. Elsewhere, there are two ponds that may be associated with water storage or ore-dressing. On the upper parts of the slope the mines become larger with large flat-topped hillocks/dressing floors. There are several engine/climbing shafts, some walled out, ruined coes and an arched level or high level sough. One hillock has a walled gin circle on an embanked hillock and several others have flat areas large enough to have contained further examples. Another hillock lies within a small belland yard. At Welshmans Venture Mine there is a well-preserved large coe, an engine shaft and the overgrown site of a gin. At Bondog Hole Mine there is a terraced and walled belland yard and dressing floor, with room for the documented gin circle and a ruined powder house (or simply a coe), all on top of a large hillock. Workings extending to the east have a further two ruined coes. On the slopes of the Via Gellia below the main complex, some workings continue and include two levels with coes at Merry Tom, and two levels at Thumper Stith, the upper one with a coe. At all there are underground workings similar to those lower down the Via Gellia, including recently discovered wooden rails at Merry Tom.

- 114: **Snake Mine** - An intact small mine complex upon a large revetted hillock, on the top of which is a small walled dressing floor with a gin circle and shaft. On a terrace to one side there is a coe containing a horizontal level to the shaft, a dressing floor and a stone lined buddle. The shaft gives access to informative underground workings.
- 115: **Gang Mine** - Hillocks and opencuts cover virtually the whole area and provide a very good example of this type of multiple-vein mining. There are also several capped shafts, two ruined coes and the site of an early reckoning/engine house that may repay excavation. These mines are known to have been working in the 16th century and had a large output in the 17th century and are historically very important.
- 116: **Ratchwood and Rantor Mines** - A site with large hillocks with flat-topped dressing floors, ruined coes and other buildings (one a ruined mine office and reckoning house), and capped shafts, one with a beehive capping. There is also a poorly defined gin circle, slight remains of a line of rectangular bouse teams, a pond and a small buddle dam. The two mines lie within ruined possible belland yards.
- 117: **Dream Hole, Fox Holes and Sand Hole Mines** - An area with extensive surviving large hillocks and a number of capped shafts on several veins. Other features include a ruined coe and elsewhere a possible damaged gin circle. Underground workings include Dream Hole with important Quaternary deposits and vein workings, including evidence for firesetting, and Fox Holes where a large chamber was mined for ochre.
- 118: **Yokecliffe Rake, and Quickset, Old Gells, Shining Cloud and Nile Mines** - An area with surviving hillocks and many capped shafts. The remains on Yokecliffe Rake comprise very large hillocks spaced at frequent intervals, with smaller hillocks between, each of the former the site of an underground mine. Several of these have ruined coes on the hillock tops and that at Quickset Mine also has a small walled mound-top dressing floor. There are also ruined coes elsewhere in the defined area. Old Gells Mine on Yokecliffe Rake provides an exceptionally interesting but small example of easily accessible underground vein and pipe workings. This mine includes evidence for early firesetting work.
- 119: **Carsington Pasture, Great Rake, Nickalum and Perseverance Mines** - Extensive hillocks and shafts survive, although some upper areas have been reworked. There is a variety of mines, including larger ones at Great Rake and Nickalum Mines. The former had an early 20th century horizontal winding engine

house of corrugated tin but concrete mounting beds survive for the engine and various other ore processing equipment. There is also a concrete hut, a displaced crushing wheel, the winch and earthworks of an inclined tramway, and a possible ruined powder house. The main features are within an earlier flat dressing floor with surrounding wall, with ruined coes and other buildings, and a probable poorly-defined gin circle. Nickalum Mine has a walled belland yard; however, the remains of a stone horizontal-winding house, a ruined coe, a probable gin circle and a possible water storage pond have recently been levelled. Nearby there are large buddle dams. Another interesting mine is Perseverance Mine which has shafts, a gin circle set into the slope, a large coe, a smaller coe, a stone-lined buddle, a water storage pond, slime ponds and a buddle dam. Most of the other mines were also small in scale and a variety of features are associated with these. They include small belland yards, hillock-top dressing floors, coes (some large and one with a remaining chimney), and water storage and/or ore-dressing ponds (an arched level entrance appears to have recently been removed or buried). Capped shafts across the area give access to a variety of underground vein and pipe workings, some apparently of great interest (currently poorly documented). Rare direct relationships with relict boundaries exist that suggest the mining here started at a medieval or earlier date in at least two cases.

- 120: **Roundlow Mine** - A well-preserved area of hillocks and shafts onto pipe/vein workings, with several capped shafts, with an engine shaft on a flat-topped hillock with poorly-defined small gin circle but a rare intact limestone bearing block with central iron bearing socket.
- 121: **Rainster Rocks and Suckstone Mines** - An extensive area with surviving hillocks and some shafts. There is also a ruined coe. In its eastern half the hillocks of small mines are very extensive, in some areas with continuous cover (including parts not indicated on the geological map). In the west the veins are less common and also usually small. However, these are important because of their stratigraphic relationships with both the Rainster Rocks Iron Age/Romano-British settlement and extensive medieval strip lynchets and ridge and furrow.

Buildings, Soughs and Other Individual Structures - Within the National Park

- B1: **Ashton's Mine** - Well-preserved two-storey horizontal engine house and chimney. Little remains of the boiler house. The shaft has been sealed but the surrounding hillock remains with retaining walls in parts. A powder house is set behind to the east.
- B2: **Co-op Sough** - An intact slabbed sough bolt at the brook side. Two other slabbed drains running under the road on the other side of the brook may well also be from sough tails (Bradwell Sough and probably Southfield North Vein Level).
- B3: **Hartledale Mine** - An intact walled hillock-top gin circle with adjacent shaft in an area that has been otherwise heavily disturbed. A crushing wheel has recently been placed next to the gin circle after its original site nearby to the south was removed.
- B4: **Windy Knoll Mine** - A crushing stone moved from adjacent hillocks when reworked, and set upright. It is inscribed 'B & Co 1842'.
- B5: **Milldam Mine** - Surviving interest includes a small one-storey horizontal-winding engine house and a one-storey mine smithy (now used as outbuildings) and a two-storey mine house (occupied). A Cornish pumping engine house has been demolished and the north-western part of the site has been developed as a modern mine.

- B6: **Old Twelve Meers Mine** - A gin circle platform cut into the steep hillside, with horse track and a central hollow where the bearing block has been removed, with an adjacent open shaft on the downslope side.
- B7: **Ladywash Mine** - The main surviving feature of interest is the chimney from a demolished horizontal pumping and winding engine house. The engine shaft gives access to an extensive 20th century disused mine; it is not clear how much historic interest remains underground.
- B8: **Ash Nursery Mine** - Walled gin circle, now overgrown, and capped engine shaft. The adjacent mineral hillocks have been removed.
- B9: **Muse Mine** - A walled gin circle on flat-topped hillock and adjacent engine shaft. The adjacent mineral hillocks have been removed and the wall largely removed with the exception of one short section.
- B10: **Brightside Sough** - A well-preserved, arched but silted, sough bolt leading to a restored water trough with well steps.
- B11: **Magpie Sough** - The arched entrance to the last major sough driven in the region. The grilled entrance leads to a fine sough and extensive Magpie Mine (and other) vein workings of 19th and 20th century date. The sough was used by boats and has the remains of wooden lock gates. Several 20th century tramways on false floors also exist in the workings above.
- B12: **Hubbadale Pipe - Two Gins Shaft** - Large overgrown hillock with a run-in shaft and presumed remains of two gin circles.
- B13: **Hubbadale Pipe - Crotie Gin Shaft** - Large overgrown hillock with a run-in shaft and presumed remains of a gin circle.
- B14: **Hubbadale Pipe - White Close Shaft** - Large overgrown hillock with a run-in shaft and presumed remains of a gin circle.
- B15: **Long Rake Mine** - The 20th century headgear and one-storey horizontal-winding engine house (engine recently moved) of the calcite mine. The main engine shaft is no longer safely accessible from surface (see 81: Long Rake Opencuts).
- B16: **Wheels Rake Mine and Shining Sough** - The main feature of interest is a well-preserved sunken wheel pit with arched roof, which once housed a waterwheel for mine pumping and winding. Adjacent is a scrin working that gives access to Shining Sough (currently flooded).
- B17: **Black Sough** - A sough leat from the sough tail to the river comprising a silted gully across flat land. Nearby there is a unique upright marker stone that marked the line of the sough, now re-erected out of line.
- B18: **Rainster Sough** - A sough leat from the sough tail to the river comprising a silted gully across flat land.
- B19: **Bowers Rake Goit** - A long straight open leat, probably dug to take water from a waterwheel pumping engine on Bowers Rake further west erected about 1700.
- B20: **Stanton Sough** - A sough leat from the sough tail to the river, comprising a broad silted gully across flat land.
- B21: **Broadmeadow Mine** - This occupied building, now a row of cottages built in three phases, is documented as the offices of the Alport Mining Company. It lies adjacent to a vein and it is thought the building lies over a shaft. A deep shaft (and hillock) nearby leads to a hydraulic engine chamber.
- B22: **Prospect Mine** - A rectangular one-storey 19th century powder house in good condition, with stone flag roof above a barrel vault. The mine lay nearby to the south.

B23: **Hillcarr Sough - Brown Bank Shaft** - The main interest is a dam, with dressed stone abutments, and an overflow race. These were built for water blast ventilation to Hillcarr Sough; they are the only such remains in the orefield. There is also a ruined possible coe nearby. The capped ventilation shaft itself is no longer visible, but there is a flat working area cut into the hillside immediately above.

B24: **Winster Ore House** - A restored one-storey ore house.

B25: **Old Millclose Mine - Watt's Engine House** - Surface features include the ruins of the Watt's Shaft Cornish pumping engine house, the foundations of a winding house possibly also incorporating a boiler for this to the north, and a larger boiler house between with three short flues to a chimney base. There are also foundations of another building, slope-retaining walls, and the site of a capstan. The shaft gives access to one small section of extensive and important pipe workings (see B26). Very extensive hillocks have been largely removed/reworked and thus are not included in the defined area of interest.

Buildings, Soughs and Other Individual Structures - Outside the National Park

- B26: **Millclose Mine** - Surface interest at this once historically very important mine includes the lower parts of a Cornish pumping engine house and chimney, and a mine office/reckoning house, all within a modern industrial complex. Two exceptionally large shafts exist, one accessible and leading down to a level branching off Yatestoop Sough (see B27).
- B27: **Yatestoop Sough** - An arched and paved sough tail leads to a long accessible section of this major sough, including a branch level, with remains of a plankway above the water. This leads to two exceptionally large shafts, both open to surface at Millclose Mine, one with in-situ pump rods, the other with timber guides for cages.
- B28: **Orchard Sough** - A low slabbed sough bolt.
- B29: **Masson Farm Level** - A narrow accessible level, probably a high level sough, with a walled and slabbed entrance.
- B30: **Carnhill Wifes Sough** - A narrow slabbed sough level.
- B31: **Bullestree Sough** - An open sough tail next to the river, leading to an historically important sough.
- B32: **Cromford Sough** - A walled enclosure with the present entrance to the sough. A long section of this major sough is still accessible, the first part arched, with shafts to surface and including a side branch that has evidence of very early gunpowder work.
- B33: **Cromford Moor Mine** - Ruined walls and the base of a stone chimney may be the remains of a documented Newcomen-type winding engine house (built 1818). At the same site there is a capped shaft, concrete foundations and a tank built in association with a 1920s calcite mine. There are extensive hillocks to west, north and east, but these have been landscaped to provide car parking, or they are suffering badly from erosion (at Black Rocks).
- B34: **Ratchwood Mine - Founder Shaft** - Large flat-topped hillock with lidded shaft, overgrown gin circle with footings of wall to one side and a small ruined coe in the hillock side.
- B35: **Meerbrook Sough Mine** - The main surviving features of interest are a one-storey horizontal winding engine and boiler house, and an adjacent dilapidated coe.
- B36: **Fritchley Sough** - A small arched sough tail with a dated (1753) keystone.
- B37: **Meerbrook Sough** - An arched sough tail that leads to a long but very wet accessible section of this major sough.

Sites where the Primary Archaeological Interest is Underground - Within the National Park

- U1: **Old Tor Mine** - A gated level leads to a rare example of a pipeworking, with blocked holes to surface, mined for Blue John (and lead).
- U2: **Speedwell Mine** - This show 'cave' includes a fine example of an underground boat level, entered by a well-made incline, the upper part arched. At the end of the show 'cave' there is a massive retaining wall that allowed the canal to pass across a high cavern part-way up its side. Beyond this the level continues, with the remains of an original boat surviving at a wider section where boats could pass. It ends in a natural streamway where there are notches for a large plankway running upstream to workings above. Further upstream there is the well-known 18th century 'miner's toast' inscription, now marred by modern graffiti. A branch passage (Whirlpool Passage) also has notches for a small plankway and there are small accessible workings at the end. Downstream the streamway also has small areas of mine workings. One has a clay lined leat. Another has a stone-paved walkway over the stream. At the junction with the boat level there is a dam wall with a large wooden bung below an arch, originally used for draining the level for maintenance.
- U3: **Peakshole Sough** - A gated sough with small vein and pipe workings above. At the inner end of the sough are the rare remains of an intact timber plankway above the level of the water.
- U4: **Bird Mine** - An oval engine shaft of large diameter, with fine limestone ginging, down to rake workings; surrounding hillocks removed.
- U5: **Moorfurlong Mine** - A shaft in a hillock leads to extensive pipe workings with an underground dressing floor with what appear to be stone-lined sieving or buddling troughs.
- U6: **Great Cucklet Mine** - A good example of a small mine level (often known as Nickergrrove Mine). There are also two shaft entrances nearby and hillocks below. The level intersects natural passages, and exploited small veins and there are cross-cuts, small stopes and internal shafts. Recent digging found wooden rails of an unusual type.
- U7: **Merlins Mine** - A good example of a small mine level (with shaft entrance nearby and hillocks below). The level intersects natural passages and exploited small veins, and there are cross-cuts, small stopes and an internal shaft. One of the cross-cuts has wear marks from the use of ore sleds.
- U8: **Watergrove Sough** - An historically important sough to Watergrove Mine, the tail now blocked but with a section accessible via a nearby short shaft.
- U9: **Moorwood Sough** - An historically important sough (gated) with impressive stone stempling within, leading to Glebe Mine and beyond.
- U10: **Greensward Rake** - A fine example of an oval climbing/winding shaft with climbing stones in the ginging and rope-wear grooves below. This is now capped and there is a ruined coe nearby. There are two further small capped shafts in the same plantation. The accessible workings from all three are only limited in extent.
- U11: **Broadmeadow Mine - Shale Drift** - A drift entrance, with a further section beyond a collapse entered via a nearby shaft, which took water from the river via raised launders, through the drift to Broadmeadow Shaft where there is a hydraulic engine chamber deep underground (see B21).
- U12: **Cowclose Mine - Main Drawing Shaft** - A shaft with a large hillock gives access to extensive underground pipe and vein workings

that may well be of great interest (character of accessible workings currently poorly documented).

- U13: **Cowclose and Leadnams Mines** - Shafts on a large hillock here give access to extensive underground pipe and vein workings that may well be of great interest (character of accessible workings currently poorly documented).
- U14: **Portaway Mine - Engine Shaft** - A gritstone-lined engine shaft gives access to extensive underground pipe workings that may well be of great interest (character of accessible workings currently poorly documented).
- U15: **Portaway Mine - Fisher's Shaft** - A shaft gives access to extensive pipe workings (character of accessible workings currently poorly documented). The large surface hillocks are still high in parts but are much disturbed.
- U16: **Wills Founder Mine** - A sleepered shaft on a flat-topped hillock that once had a gin, that leads to interesting underground workings, including the site of a pumping engine that is now in the Mining Museum at Matlock Bath.
- U17: **Placket Mines (north-west)** - A deep engine shaft that give access to very extensive pipe and vein workings of great potential interest. Little detail of the character is yet recorded, but a long underground buddle has been noted.
- U18: **Placket Mines (south-east)** - A deep engine shaft that gives access to the same workings as U17.
- U19: **Upper Orchard Mine** - A deep engine shaft, at the top end of a large hillock, that leads to extensive pipe and vein workings (character of accessible workings currently poorly documented).
- U20: **Upper Orchard Mine - Old Weston Shaft** - A deep engine shaft, at a disturbed hillock, that leads to extensive pipe and vein workings (character of accessible workings currently poorly documented).
- U21: **Millclose Sough** - A large sough bolt leading to the outer part of an historically important sough (also see U4, U20). The outer cut and cover section, which can be entered a short distance from the tail, has a slabbed floor and roof, with notched gritstone uprights between. There are two short sections within with sweeping pickwork, a wooden launder at one point and various capped air shafts to surface.
- U22: **Millclose Sough - Valley Shaft** - A re-opened shaft with fixed ladders gives access to a long inner section of the sough (also see S9, U4), with surviving wooden launders in the sough, and pump pipes at Boltwood Shaft. This shaft in Clough Wood is also open to surface, as is Deer Shaft further east.
- U23: **Millclose Sough - Air Shaft** - This shaft, with fixed ladders, gives access to a long central section of this historically important sough (also see 72, U20). There are no surface hillocks. It is also possible to enter extensive workings of Old Millclose Mine from here (see U24, U25).
- U24: **Old Millclose Mine - Limbreck (Shale) Shaft** - This shaft gives access to lower parts of particularly extensive and important pipe and vein workings (for details of the underground workings see U25). The hillocks in the vicinity have been disturbed. The two shafts listed are the two most commonly used today, but there are several other open shafts to the workings.
- U25: **Old Millclose Mine - Hamber Grove (Sleeper) Shaft** - This shaft gives access to the upper parts of particularly extensive and important pipe and vein workings. The underground workings contain many mine artefacts and inscriptions, clay fairy rings, coffin levels, an arched level, a railed level, a paved level, barrow ways, stairways, ore chutes, ventilation walls sealed with clay, a walled fang or air duct, dressing floors, buddles, wooden launders,

stone-built and clay-lined leats, a wooden pump barrel and an underground forge. The two shafts listed are the two most commonly used today, but there are several other open shafts to the workings.

- U26: **Roylede Mine and Sough** - A recently re-opened sough leads to extensive copper mine pipe workings above (artefacts now placed in the Peak District Mining Museum).
- U27: **Hartington Level** - A good example of a long mid-19th century haulage level where lead and ironstone were mined.
- U28: **Robin's Shaft Mine** - An unusual steeply inclined shaft at a small but deep copper mine with various levels, stopes and natural chambers to a depth of 90m.

Sites where the Primary Archaeological Interest is Underground - Outside the National Park

- U29: **Masson Sough, Old Jants Mine and Gentlewoman's Pipe** - A sough level, now entered via a manhole cover near the river, leads to the longest accessible coffin level sough in the orefield, and then to extensive pipe workings. There are shafts to surface, fine examples of pickwork including garlands, various miners' inscriptions, a wooden hotching trough, miners' tools, etc.
- U30: **Nestus Pipes, Longtor Mines, and Bacon and Coalpit Rakes** - At surface the remains comprise either hillocks and opencuts along veins, only some of which are still intact, or shafts down to pipe workings, many of which have now been sealed. The extensive underground workings at Nestus Pipes and Bacon Rake (Masson and Rutland Caverns) and Coalpit Rake (Devonshire Cavern), all with adit entrances, are exceptionally important for their evidence of early mining. At the Nestus Pipes there are labyrinthine medieval (or earlier) pipe workings primarily identified from their distinctive 'woodpecker' pickwork. Documentation shows that there was extensive working here (and on Bacon Rake) by 1470. At the complex vein workings at Coalpit Rake there is extensive evidence for firesetting using coal; documentation shows this mine was active by 1595. At the Nestus Pipes and Coalpit Rake there is a large number of hand picked shafts from surface. The former site has coffin levels, much underground evidence for later mining

dating from the late 17th century to the 20th century, and there are two fine picked sets of dated initials from around 1700. The Nestus Pipes also have large packs of deads in the area around the main point of 20th century mining access. There are further accessible important underground rake and pipe workings at Longtor Mine (with good examples of 18th-20th century work), Long Tor Top Mine (with firesetting with coal and later powder work) and Dark Hole Mine on Bacon Rake (with firesetting with wood and coal, and later powder work).

- U31: **Side Mine** - A good example of a pumpway level that contained flat rods, with stopes containing fine examples of stone stemples, an underground pumping chamber and flooded winzes.
- U32: **Owlet Hole** - A small mine with both vein and pipe workings, the latter worked for fluorspar in the 20th century. Older workings include powder work in small levels and stopes, and a fine example of a small level driven by firesetting with coal.
- U33: **Hagg Mine** - A pumpway level that contained flat rods, with mineral workings and a coffin level that are now mostly flooded.
- U34: **Wapping Mine and Cumberland Cavern** - Wapping Mine is an impressive example of 20th century fluorspar rake and pipe working, with large stopes and high packs of deads, with evidence of earlier small-scale lead working, including evidence for firesetting and early powder work. Cumberland Cavern, entered via Wapping Mine, is a good example of a small mine in largely natural caverns. Various surface shafts and the blocked adit entrance to Cumberland Cavern once gave access to the workings.
- U35: **Bage Mine** - A deep shaft gives access to extensive vein workings and cross-cuts below the shale (character of accessible workings currently poorly documented).
- U36: **Haslowfield Level** - A level, often known as Spinney Level, with in-situ wooden rails, leads to workings on a vein with fine stone stemples.
- U37: **Golconda Mine** - A deep shaft gives access to extensive pipe workings of great interest (character of accessible workings currently poorly documented). All surface features have been removed, including a coe that survived until recently.

Appendix D:**Archaeological Lead Mining Features - Known Levels of Loss****KEY**

- A: Feature type.
- B: Original number.
- C: Number surviving in 1950.
- D: Number surviving in 2003 (common features - giving all Category A listed sites in the Inventory of Sites; rare features - giving all known examples (sometimes with more than one per site) - except Trunk buddles/leats, Buddles, Buddle dams, Beehive caps, and Mine roads, which are listed by the number of sites where they are present rather than their individual numbers (these are listed in brackets).
- E: Number surviving in 2003 of Inventory sites with notable examples (common features list) or all examples (sometimes with more than one per site) in relatively good condition (rare features list), those marked + are sites of exceptional interest and 'typical' examples are significantly more frequent. For those listed in brackets see column D.

Common Surface Features

A	B	C	D	E
Opencuts	Many	?	36	13
Engine shafts	Many (hundreds)	?	Relatively common but usually capped	14+
Climbing/drawing shafts	Many (thousands)	?	Common but usually capped	4+
Access levels	Relatively common	?	12	5
Coes	Many (hundreds)	?	46	13
Dressing floors	Many (thousands)	?	34	10
Water storage and ore-dressing ponds, and dressing pits	Many	?	30	13
Belland yards	Many (hundreds)	?	37	10

Rare/Special Surface Features

A	B	C	D	E
Newcomen and other 18th century engine houses	34	7	6	1
19th century Cornish engine houses, miners' dries, boiler houses and chimneys	25	9	7	3
19th century horizontal engine houses, boiler houses and chimneys	32	19	16	6
Mine offices/reckoning houses/overseers' houses/smithies, etc	Uncommon	30	30	19
Powder houses	Uncommon	7	7	4
Smelters at mine sites	Rare	2	2	0
Possible calciners at mine sites	Very rare	1	1	1
Ore houses	Rare	2	1	1
Soughs - entrances/goits	About 350-400	34	32	29
Waterwheel pits and other associated features	24+	5	5	3
Leats for water raised by pumping	Probably relatively common	?	2	1
Water blasts and other associated features	Probably uncommon	1	1	1
Ventilation fire houses	13+	1	1	0
Gin circles	250+	171	69	49
Large haulage levels	Relatively rare	?	6	6
Crushing circles/wheels	34+	26	15	7
Knockstones	Many (but usually portable)	?	1	1
Bouse teams	Rare	?	6	3
Ore storage bins	Probably relatively common	?	10	0
Trunk buddles/leats	Probably relatively common	?	[16]	[10]
Buddles - stone-lined rectangular troughs	Probably common	?	[13]	[12]
Buddles - circular and D-shaped sets	4+	2	2	2
Slime ponds	Relatively rare	?	6	6
Buddle dams	Relatively common	?	[20]	[18]
Beehive caps	Many	?	[8]	[6]

A	B	C	D	E
Barrow runs (or raised launders)	Probably relatively common	?	5	5
Water diversion leats	Probably rare	?	1	1
Mine roads	Probably rare	?	[4]	[3]
Tramways	Probably relatively uncommon	?	4	4
Limekilns and quarries used for mine building construction or processing waste rock	Rare	?	4	4
Meerstones	Possibly relatively uncommon	?	2	2
Sough marker stones	Probably very rare	?	1	1
Late 19th and earlier 20th century lead/gangue mine buildings (including headgear and other structures)	Uncommon	?	10	4

Appendix E:

Ecological Survey Methodology Used to Survey Lead Rake Sites and Ground-Truthing of the Aerial Photograph Analysis

Ecological Survey

Since initial survey in 1997 the survey methodology has been gradually refined. Records are completed on a field-by-field basis. Currently, for each lead rake within a field, a Lead Rakes General Record Card is completed giving the following: a description of the sward, a description of the different communities and an estimate of the percentage of the total rake area occupied by each National Vegetation Classification (NVC) community [23, 69].

A Lead Rake Communities Record Card is also completed (based on a combination of the English Nature condition assessment cards for acid, neutral and calcareous grasslands). The frequency of favourable and negative indicator species are recorded based on 20 stops made at random during a structured walk through the unimproved communities on the rake. For each rake a particular note is made of the presence of key species. The condition of each unimproved community type (acid, neutral, calcareous) occurring on the rake is assessed by the frequency of indicator species and physical characteristics of the sward. Where a particular community is under represented in the structured walk (due to small area) a Peak District National Park Authority (PDNPA) Grassland Record Card is also completed for this community. If the area of unimproved grassland is too small to justify a structured walk, only a PDNPA Grassland Record Card is completed.

Following the species survey, lead rakes are graded into Categories A, B or C for ecological interest. The ecological value of lead rakes is based on the representation of unimproved grasslands, the presence of metallophyte communities and the complexity of sites.

Category A:

- Lead rakes of high ecological value which support good examples of unimproved neutral, calcareous and/or acid grasslands - evaluated as unimproved pasture evaluation.
- And lead rakes that are complex, supporting a mosaic of different community types.
- And/or lead rakes that support areas of metallophyte communities in which the metallophyte species are greater than 'rare', except for alpine penny-cress where its presence will suffice rather than being greater than 'rare'.

Category B:

- Lead rakes of moderate ecological value, but which still support unimproved but less diverse grasslands.

- And/or lead rakes that support metallophyte communities in which the metallophyte species are rare.
- And lead rakes that may exhibit a mosaic but include areas of semi-improved species-poor sward.

Category C:

- Lead rakes of limited ecological value that support only very small patches of unimproved swards with no metallophyte vegetation.
- Generally dominated by grassy swards.

Improved:

- No or negligible remaining ecological interest.

Essentially this grading reflects the frequency of species of ecological interest set against the extent of any semi-improved or improved vegetation on the rake. Where several lead rakes exist in one field a combined grade was given; this was generally that of the highest-graded lead rake in the field. The exception was for fields that contained only very small areas of rakes of ecological interest and much larger areas of lead rakes with more agriculturally improved rake vegetation. The combined lead rake grade for such sites generally reflected the vegetation on the less ecologically interesting lead rakes.

The vegetation and communities surrounding the rakes was also noted. If the off-rake vegetation included unimproved grassland, then the communities were mapped and surveyed using the appropriate (acid, neutral or calcareous) Grassland Monitoring and Survey Card wherever possible.

Ground-Truthing

The lead rakes and their condition had already been digitised onto a base map as part of the aerial photograph analysis of the orefield summarised in Chapter 4 [5]. These were checked on the ground to confirm the condition of hillocks and that their location had been mapped accurately. Following the conventions used in the aerial photograph analysis, the hillocks were categorised as follows:

1. Hillocks wholly or largely undisturbed.
2. Intermittent remains (partly removed or damaged).
3. Hillocks wholly or largely removed or ploughed out.

Where remains were present these were recorded on the site sketch map, and this included examples where hillocks had been 'wholly or largely removed or ploughed out' but isolated hillocks remained. Where necessary the digitised database was amended.

Appendix F:

The Ecological Survey - Results to Date

The ecological survey carried out by the Lead Rakes Project has concentrated on sites that do not lie within biological cSACs and SSSIs, primarily because these are already identified and documented (if sometimes not in detail) and are not at risk. At present, survey work, which is being carried out on a prioritised area by area basis, is only about two-thirds complete; thus the results presented will be updated as more work is carried out. The brief review given below concentrates on the Category A highlights (Appendix E). Totals for every important community are given in the table below which summarises the survey of 131.56ha of lead rake surveyed to date by the Project (i.e. 50.8% of the estimated total resource of 260ha).

All known Category A sites, including those outside the areas already surveyed where data exists, are listed in the Inventory. This includes those within cSACs and SSSIs.

Lead Rake Plant Communities

This section describes the most diverse and interesting lead rake communities found to date, following the National Vegetation Classification (Appendix G) [23, 69], which is shown in brackets.

A total of 6.37ha of lead rake within the rakes surveyed to date by the Lead Rakes Project support a metallophyte community comprising a spring sandwort/alpine penny-cress/pyrenean scurvy grass open vegetation with harebell, fescue and sorrel and often lichens and mosses (OV37). Typically this community is sparsely vegetated with much open ground and is usually confined to toxic spoil heaps and areas from where the hillocks have been stripped leaving ground which is contaminated with heavy metals. The area with most of this community is Castleton/Peak Forest. A further total of 2.51ha of a fescue and alpine penny-cress metallophyte community have been found, all in the Bonsall Moor area.

The lead rakes have also been found to be an important refuge for calcareous grassland and particularly a community comprising sheep's fescue/meadow oat grass (CG2d), which is normally a classic daleside grassland. This tends to be a very species-rich and diverse grassland, often with frequent quaking grass, glaucous sedge, crested hair grass, fairy flax, thyme, salad burnet, hoary plantain and eyebright. In the best examples with autumn gentian, limestone bedstraw, rock rose, kidney vetch, early purple orchid and frog orchid. 8.80ha of this type of grassland have been found, with the largest amount so far occurring in the Bonsall Moor area. The topography and substrate from which the hillocks are made are characteristic of the steep daleside slopes on which this community is more commonly found in the Peak District. This community has been most often found on the south facing slopes of the hillocks that comprised of limestone and mineral spoil. Spring sandwort is also found as a component of this community and it appears that given time the first habitat described (OV37) may develop into this classic daleside grassland community (CG2d) on lead rakes. The survey work on Bonsall Moor suggested that this latter type of vegetation is confined to hillocks that have not been disturbed for a long period of time.

Of all the calcareous species found in this grassland (CG2d), meadow oat-grass appears to be the species most restricted to older hillocks. The Unit of Comparative Plant Ecology at Sheffield University [37] found that this species is confined to infertile and undisturbed sites. It is a slow-growing grass with no persistent seed bank, low mobility and thus is restricted to grasslands of some antiquity.

A total of 10.39ha other calcareous communities as described in Appendix G were also found (CG7/CG10), as well as 14.50ha of other calcareous grassland communities; survey results are available in the survey reports [15-20].

One of the most attractive of the neutral grassland communities found on lead rakes is the lady's bedstraw sub-community (MG5b) of the crested dogs tail/common knapweed grassland (MG5). This community is

usually species-rich and diverse with frequent lady's bedstraw, common knapweed and bird's-foot-trefoil. Species associated with lime rich soils are also an important and attractive part of this community and often include fairy flax, salad burnet, rough hawkbit, hoary plantain and cowslips. 19.23ha of this sub-community have been surveyed as part of the Lead Rakes Project. A total of 10.40ha other neutral communities as described in Appendix G were also found (MG5a/MG5c), as well as 4.71ha of MG9; survey results are available in the survey reports [15-20].

The acid grasslands on lead rakes are typically sheep's fescue/common bent grass/heath bedstraw grassland (U4). 16.09ha of this community have been surveyed as part of the Lead Rakes Project. A total of 0.82ha of other acid communities, as described in Appendix G, were also found (U2/U5); survey results are available in the survey reports [15-20]. The acidic communities are naturally poor in species and are characterised by an abundance of sheep's fescue and mosses with occasional bent grass, sweet vernal grass, field woodrush, common violet, harebell, common sorrel, lady's bedstraw, crested hair grass and tormentil. In the best examples of the U4 community on lead rakes mountain pansy is frequent.

The Metallophytes

Four metallophyte species were chosen as key metallophytes for the purposes of the survey and database production.

Spring sandwort has been found in all survey areas but is only common in the Bonsall Moor and Castleton/Peak Forest areas and at certain sites in the Bradwell area.

Alpine penny-cress has only been found in large numbers during the Lead Rakes Project survey at Bonsall Moor and even then is restricted in its distribution. Only one plant was found in the Elton area. Clearly it is important to safeguard any site that has alpine penny-cress.

Mountain pansy is normally restricted to the acidic communities and therefore the Castleton/Peak Forest area, which is generally at a high altitude where these are common, is particularly important for this species.

Pyrenean scurvy grass is restricted to the Castleton/Peak Forest area and survives in areas that ironically are normally regularly disturbed, as for example by motor bike scrambling, or on sites that are hostile to competitive plants as on steep slopes of toxic mineral spoil. Such areas are rare and account for only 7% of the surveyed area of lead rakes in the Castleton/Peak Forest area.

Localised Distinctions and Characteristics

The surveys undertaken so far highlight the rarity of the metallophyte species and the need to prioritise sites that support these species as well as the communities that contain them. The detailed surveys which have been carried out as part of the Lead Rakes Project have also highlighted distinct differences and special characteristics of different parts of the orefield [15-20].

- Bonsall Moor is significant for its populations of alpine penny-cress and large areas of metallophyte and calcareous grassland with associated species such as frog orchid.
- Castleton/Peak Forest is important for its large areas of acid and upland calcareous grassland. It also supports good populations of mountain pansy and, more locally, pyrenean scurvy grass.
- The Bradwell survey highlighted how limited the resource now is in this area, with a lack of sites for metallophytes and metallophyte communities in the area. This is a reflection of the losses of lead rakes in the area with over half having been removed by intensive reworking of the hillocks for fluorspar and by agricultural improvement in the area.
- Winster and Elton were also notable for the absence of metallophytes and metallophyte communities. The resource in

this area is limited in extent and the areas with key communities are small when compared with Castleton, Bradwell and Bonsall survey areas. Like Bradwell, Winster has seen intense reworking of hillocks for fluorspar and agricultural improvement. In the Winster/Elton area in particular, some workings lie under shale and the hillocks here contain this material making them more neutral in character. Similarly, many of the deposits worked in the Winster/Elton area contained much clay that has been brought to surface and this has had a similar effect.

- The Monyash area was disappointing for metallophytes and metallophyte communities. However, it does support some very interesting and diverse lead rake grassland communities. Unlike the other areas, the ground-truthing led to a significant revision of our knowledge as to what survives when compared with the aerial photograph assessment. A significant number of hillocks on small veins were found that were previously undocumented.

The survey data from Sheldon/Taddington/Flagg area has still to be fully assessed.

	Area of Important Plant Communities Associated with Lead Rakes (to nearest 0.01ha)						
	Bonsall Moor	Castleton/ Peak Forest	Bradwell	Winster	Elton	Monyash	Totals
Total Area of Rake Surveyed	27.87	45.50	21.11	14.13	14.84	8.11	131.56
Calaminarian Grassland OV37	1.80	3.41	1.12	0.02	0.01	0.01	6.37
Fescue/Alpine Penny-cress	2.51	-	-	-	-	-	2.51
Calcareous Grassland CG2d	5.02	2.19	0.38	1.03	0.11	0.07	8.80
CG7	0.24	2.71	0.77	0.01	-	0.01	3.74
CG10	-	5.92	0.73	-	-	-	6.65
Other Calcareous Grasslands	5.44	5.90	1.76	0.07	0.93	0.40	14.50
Neutral Grassland MG5a	2.02	0.62	1.25	1.40	4.47	0.17	9.93
MG5b	7.38	0.83	3.21	2.01	3.56	2.24	19.23
MG5c	0.40	-	0.05	0.02	-	-	0.47
MG9	-	4.67	0.03	0.01	-	-	4.71
Acid Grassland U2	0.13	0.10	0.03	-	-	-	0.26
U4	2.45	11.77	0.95	0.19	0.07	0.66	16.09
U5	-	0.55	0.01	-	-	-	0.56

Appendix G:

Extracts from the Peak District Biodiversity Action Plan Audit that are Relevant to Lead Rakes

The Peak District Biodiversity Action Plan [43] provides an audit of habitats listed in the UK Biodiversity Steering Group Report [39] as Key Habitats.

Vegetation Types

Lead rakes are an extremely rich resource of vegetation types including calcareous, neutral and acidic grassland, limestone heath and sparse open swards. The grasslands fall into one of four main groups:

1. Metallophyte Vegetation - There are two distinct true metallophyte communities in the Peak District:

- Open, sparse - National Vegetation Community (NVC) OV37, sheep's fescue, spring sandwort vegetation.
- Fescue dominated sward with alpine penny-cress (a possible variant of OV37).

The OV37 community with spring sandwort is characterised by limited vegetation cover (as little as 10%). Species commonly associated with this community include sheep's fescue, thyme and eyebright. In contrast, the typical fescue-dominated sward with alpine penny-cress is characterised by an abundance of fescue in a closed, species-poor sward. Associated species only occur as occasionals, the most common being common sorrel, harebell and crested hair grass.

2. Calcareous Grasslands - The lead rakes of the Peak District are a rich resource of calcareous grasslands, which dominates the areas of lime rich spoil. NVC types include:

- **CG2d** - Sheep's fescue - meadow oat-grass, heath moss sub-community.

This classic daleside community is characterised by an abundance of sheep's fescue, meadow oat-grass, thyme, fairy flax, glaucous sedge, salad burnet and rock rose. The best examples of calcareous grasslands are very attractive with a rich mix of herbs, grasses and sedges with up to 40 species per metre square. A number of uncommon species are often found such as frog orchid, fragrant orchid and autumn gentian.

- **CG7** - Sheep's fescue - mouse ear hawkweed - thyme grassland.

This community is characterised by an abundance of thyme and mouse ear hawkweed. These species often dominate whilst other calcareous species though present are often only scattered in the sward including autumn gentian, fairy flax, bird's-foot-trefoil and eyebright.

- **CG10** - Sheep's fescue - common bent - thyme grassland.

This community represents a transition between true calcareous grassland and acidic grassland. The sward is characterised by a mix of calcareous species such as thyme and limestone bedstraw and species indicative of acidic grassland such as heath bedstraw and tormentil. Grasses, particularly sweet vernal and common bent, tend to be more prominent here whereas herbs and sedges tend to dominate the other calcareous swards. Calcareous species are less prominent in this community than in the other calcareous grasslands and generally the examples are poor in species. Notably, spring sandwort was often found as a component of CG10 grasslands.

3. Neutral Grasslands - Neutral grasslands can also be important on lead rakes, the most frequent being common MG5a - crested dogs tail - common knapweed grasslands. All three sub-communities are found:

- **MG5a** - Meadow vetchling sub-community.
- **MG5b** - Lady's bedstraw sub-community.
- **MG5c** - Heath grass sub-community.

The richest examples include an abundance of species which are confined to unimproved, traditionally managed grasslands, such as cowslips, devils bit scabious, field scabious, hoary plantain, bird's-foot-trefoil, common knapweed and quaking grass.

4. Acid Grasslands and Heaths - There are three distinct types of acid grassland associated with the lead rakes of the Peak District:

- **U2** - Wavy hair grass grassland.

The U2 community is dominated by wavy hair grass with occasional common sorrel, tormentil and heath bedstraw. Occasionally bilberry will be found in the sward.

- **U4** - Sheep's fescue, common bent grass, heath bedstraw grassland with mountain pansy.

This acidic community is naturally poor in species characterised by an abundance of sheep's fescue and mosses with occasional bent grass, harebell, common sorrel, lady's bedstraw, crested hair grass and tormentil. In the best examples mountain pansy is frequent and even locally abundant.

- **U5** - Mat grass, heath bedstraw grassland.

This distinctive, very poor acid grassland is dominated by mat grass. Associated species include occasional bilberry, harebell, moss, heath bedstraw and mountain pansy.

Heaths are very rare on lead rakes but occur where dwarf shrubs have re-colonised the hillocks from the surrounding land following the working of the lead vein. In NVC terms they tend to be H9 - heather, wavy hair grass heath with small areas of H12 - heather, bilberry heath.

The detailed surveys which have been carried out as part of the Lead Rakes Project have highlighted distinct differences and special characteristics of different parts of the orefield.

Lead rakes are not only important for plants but for a range of other wildlife associated with flower rich grasslands. The profusion of different species provides a wealth of nectar for insects and seed for birds and small mammals. The sparsely vegetated areas of spoil are important for lichens and provide 'hot spots' for invertebrates. In addition, features such as old mine shafts can provide roosts for bats and the stony heaps provide hibernation sites for amphibians. A range of nationally and locally significant lichens, invertebrates and plants are associated with lead rakes. These include three nationally significant plants, alpine penny-cress, spring sandwort and maiden pink.

Significant Species in a National Context

Plants - The following plants are identified as Nationally Scarce:

Minuartia verna	spring sandwort
Thlaspi caerulescens	alpine penny-cress
Dianthus deltoides	maiden pink
Verrucaria murina	lichen
Veizdaea retigera	lichen
Verrucaria melaenella	lichen
Bacidia viridescens	lichen
Veizdaea aestivalis	lichen

Mammals - The following mammal is identified as a Priority Species in the UK Biodiversity Steering Group Report - Short List and Middle List [39]:

Lepus europaeus	brown hare
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Birds - The following bird is identified as a Priority Species in the UK Biodiversity Steering Group Report - Short List and Middle List [39]:

Alauda arvensis	skylark
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Invertebrates - The following spider is identified as Nationally Scarce:

Pirata latitans	spider
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Significant Species in a Natural Area Context

Plants

Cochlearia pyrenaica	pyrenean scurvy grass
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Invertebrates

Perizoma albulata	grass rivulet moth
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Appendix H:

Lead Mining Related Scheduled Monuments

Lead mining remains within Scheduled Monuments are given full protection from any form of ground disturbance without Scheduled Monument Consent; where disturbance would be significant this is normally not granted except in exceptional circumstances. Anyone illicitly damaging the archaeological interest at a Scheduled Monument is liable to prosecution.

The ecological interest of a Scheduled Monument is not always protected in that this can be damaged without ground disturbance, for example by the application of fertiliser, lime, herbicides, slurry or paper pulp.

Current Scheduling

There are 36 mine-related sites in the orefield that are Scheduled Monuments (Winter 2003), listed here in tabular form. Of these the majority include mining waste hillocks as well as specific features of interest, although in a few cases it is only specific features that are scheduled.

KEY

- A: Scheduled Monument number.
- B: Scheduled Monument name (which in some cases differ from those used in the Inventory).
- C: Inventory of Regionally and Nationally Important Lead Mining Sites number. In many cases only part of the area defined in the Inventory is scheduled.
- D: Length of vein hillocks within the scheduled area, in kilometres, derived from aerial photograph assessment - present in good/ reasonable condition.
- E: Length of vein hillocks within the scheduled area, in kilometres, derived from aerial photograph assessment - present in intermittent condition.
- F: Area of pipe/flat hillocks within the scheduled area, in hectares, derived from aerial photograph assessment - present in good/ reasonable condition.
- G: Area of pipe/flat hillocks within the scheduled area, in hectares, derived from aerial photograph assessment - present in intermittent condition.

Within the National Park

A	B	C	D	E	F	G
27223	Odin Mine	1	-	0.2	-	-
27224	Engine Sough	1	-	-	-	-
30954	Peakshill or Oden Sough	2	-	-	-	-
29966	Faucet Rake Mines	4	1.2	1.5	-	-
29965	New Rake Mines	5	1.2	0.1	-	-
30956	Pin Dale Side Veins	6	0.7	0.8	-	-
29963	Slitherstone and Linacre Mines	9	1.8	2.6	-	-
29964	Eldon Hill	9	0.1	0.1	-	-
29962	Watt's Grove Rake	9	1.2	1.4	-	-
29961	Oxlow Rake	12	1.2	1.4	-	-
30955	Hills Venture Mine	13	0.3	0.1	-	-
29969	Cop Rake and Moss Rake Mines	14/15	0.9	0.4	-	-
27217	Tideslow Rake	30	1.4	0.6	-	-
30938	Cackle Mackle and Stadford Hollow Mines	44	2.3	0.8	-	-
27219	Longstone Edge Coes	45	-	-	-	-
DR257	Red Rake Mine	48	-	-	-	-
30939	Brightside Mine	49	-	-	-	-
29976	Magpie Mine	64	0.8	0.1	-	-
27220	Trueblue Mine	65	-	0.1	-	-
30944	Lathkill and Mandale Mines	78	-	0.5	-	-
27222	Hillcarr Sough	85	-	-	-	-
29975	Gratton Dale Mines	87	0.5	0.2	14.7	-
30952	Rainslow Scrins	88	0.6	0.7	-	-
27211	Winster Pitts and Drummer's Venture	93	-	0.2	2.7	-
30943	Mount Pleasant Mines	98	-	0.6	-	-

A	B	C	D	E	F	G
30945	Northern Dale Mines	99	0.9	1.2	-	-
30942	Gorseydale Mines	102	0.2	0.4	-	-
29968	Slack, Mount Pleasant and Barmaster Grove Mines	102	0.1	0.1	-	1.7
29967	Beans and Bacon, Old Eye, Fiery Dragon and Cod Beat Mines	102	0.6	0.4	-	3.0
30940	Bonsall Leys Mines	107	1.3	1.2	-	-
30953	Old Millclose Engine House	B25	-	-	-	-

Outside the National Park

24984	High Tor Mines	111	-	0.5	-	-
27218	Snake Mine	114	-	-	-	-
24986	Nether Ratchwood and Rantor Mines	116	-	-	-	-
27221	Cromford Sough	B32	-	-	-	-
30957	Meerbrook Sough	B37	-	-	-	-

Future Schedulings

At the time of writing (winter 2003), all of the sites recommended for scheduling under the Lead Industry assessment have now been scheduled as part of the Monuments Protection Programme. In addition to the lead mining schedulings, it is known that the extensive and extremely important copper/lead mines at Ecton are being considered

under the Non-Ferrous Metals (Tin, Copper, Arsenic and Minor Metals) Industry assessment. A few fluorspar and calcite mining sites are also being considered here. These comprise the High Loft Mine on Masson Hill, Matlock Bath (underground workings only); Long Rake Mine, Youlgreave; Ladywash Mine, Eyam; and Harrybecca (Bacon's) Mine, Hassop. In all cases, firm details of what exactly will eventually be scheduled are not yet available.

Appendix I:

Lead Mining Related Candidate Special Areas of Conservation and Sites of Special Scientific Interest

1. Lead Rake Habitat Special Interest

Candidate Special Areas of Conservation (cSACs) and Sites of Special Scientific Interest (SSSIs) afford full protection to lead rake habitats (notably metallophytes/calaminarian communities) where these habitats are a feature of the special interest of the site as recognised in the site notification. There are two cSACs in the orefield: Gang Mine, a single site; and Peak District Dales, which comprises nine separate valleys.

KEY

- A: Name of SSSI.
- B: Length of vein hillocks within the designated area identified by aerial photography in good/reasonable condition (in km).
- C: Length of vein hillocks within the designated area identified by aerial photography in intermittent condition (in km).
- D: Area of pipe/flat hillocks within the designated area identified by aerial photography in good/reasonable condition (in ha).
- E: Area of pipe/flat hillocks within the designated area identified by aerial photography in intermittent condition (in ha).
- F: Part of a cSAC.

Sites of Special Scientific Interest where Metallophytes/Calaminarian Communities are the Primary Reason for SSSI Notification

Within the National Park

A	B	C	D	E	F
Oxlow Rake	1.6	0.2	-	-	no
Tideslow Rake	1.4	0.6	-	-	no
Bonsall Leys	1.9	1.6	-	-	no

Outside the National Park

Gang Mine	0.6	0.7	-	-	yes
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Sites of Special Scientific Interest where Metallophytes/Calaminarian Communities are Part of the Notified SSSI or cSAC Interest

Within the National Park

A	B	C	D	E	F
Castleton	9.0	11.8	-	-	no
Coombs Dale	0.4	0.9	-	-	yes
Longstone Moor	2.7	1.5	-	-	no
Cressbrook Dale	1.5	3.8	-	-	yes
The Wye Valley (part)	2.7	3.8	-	-	yes
Long Dale and Gratton Dale	0.5	0.9	-	-	yes
Clough Woods (part)	-	-	-	-	no
Masson Hill (part)	-	-	-	-	no
Via Gellia Woodlands	0.2	0.9	-	-	yes

Outside the National Park

The Wye Valley (part)	-	0.3	-	-	yes
Clough Woods (part)	-	-	-	-	no
Masson Hill (part)	0.4	1.6	-	-	no
Matlock Woods	-	0.8	-	-	yes
Via Gellia Woodlands	0.8	1.1	-	-	yes
Rose End Meadows	0.2	0.3	-	-	no

Sites of Special Scientific Interest where Lead Mining Sites are Present but are Not Part of Notified Interest, but are Afforded Protection due to Other Notified Grassland Interests being Present

Within the National Park

A	B	C	D	E	F
Topley Pike and Deep Dale	-	0.7	-	-	yes
Monk's Dale	-	0.4	-	-	yes
Stoney Middleton Dale	-	0.9	-	-	no
Lathkill Dale	0.5	2.8	-	-	yes
Ballidon Dale	-	0.1	-	-	yes
Parwich Moor	0.1	-	-	-	no
Dove Valley and Biggin Dale	-	0.7	-	-	yes
Hamps and Manifold Valleys*	0.3	1.4	8.5	-	yes**

* The recorded pipe/flat hillocks lie within both the Ecton Copper Mines and Hamps and Manifold Valley SSSIs.

** Some of the mining interest lies outside the cSAC boundary.

Outside the National Park

Hipley Hill	0.1	0.1	-	-	no
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2. Geological Special Interest

Geological SSSIs stem from a major initiative to identify and describe the most important geological sites in Britain, which began in 1977 with the launching of the Geological Conservation Review (GCR). The GCR was designed to identify those sites of national and international importance needed to show all the key scientific elements of the Earth heritage of Britain. These sites display sediments, rocks, fossils, and features of the landscape that make a special contribution to our understanding and appreciation of Earth science and the geological history of Britain, which stretches back hundreds of millions of years.

In the Peak District orefield a range of sites have been designated under the GCR to cover the interest of mineralisation in the limestone bedrock. Within these site boundaries physical lead rake remains and natural geological features are protected by the statutory designation insofar as they are of geological special interest.

Within the National Park

A	B	C	D	E	F
Castleton*	9.0	11.8	-	-	no
Dirtlow Rake and Pindale	0.8	1.8	-	-	no
Portway Mine	0.1	-	-	-	no
Upper Lathkill	0.6	0.2	-	-	no
Ecton Copper Mines*	-	1.5	22.6	-	no
Masson Hill (part)*	-	-	-	-	no

Outside the National Park

Masson Hill (part)*	0.4	1.6	-	-	no
Bage Mine	-	-	-	-	no

* The Castleton and Masson Hill SSSIs are designated for both their biological and geological interest. The boundary of the Ecton Copper Mines SSSI overlaps with Hamps and Manifold Valleys SSSI, and here the surface lead mining ecological interest is therefore protected by the latter.

Appendix J:

General Permitted Development Orders and Minerals Planning

The requirement that planning permission be obtained before some types of development can be undertaken is a regulatory mechanism. Intervention in the development process by the planning authority is justified on the grounds that it is in the public interest.

However, in order to simplify the development process and to make the planning system more manageable, the General Permitted Development Order 1995 (GDPO) exists to modify the general requirement for planning permission when construction works or a change of use of land and buildings are proposed. Some works and some changes to the use of buildings that may have environmental or other implications are excluded from the meaning of development, and hence do not require planning permission. Some activities that are within the meaning of development are excluded from the development control process by the automatic granting of planning permission, as permitted development.

Thus GPDO directs that planning permission is not needed for certain development in certain restricted circumstances, which are listed in Schedule 2 of the GPDO and conditions set out and explained in article 3. The exploration and removal of minerals can sometimes be included (in parts 22 & 23 of Schedule 2 - Mineral exploration and Removal of material from mineral-working deposits), as development not requiring planning permission. However, these circumstances are restricted as detailed below.

Article 4 - Directions Restricting Permitted Development

If the Secretary of State or the appropriate local planning authority is satisfied that it is expedient that development listed anywhere in Schedule 2 of the GPDO (excluding Class B of Part 22 or Class B of Part 23, which will be addressed below), should not be carried out

unless permission is granted for an application, he or they may give direction under article 4, that the permission granted by article 3 shall not apply to -

- All or any development of the Part, Class or paragraph in question in an area specified in the direction; or
- Any particular development, falling within that Part, Class or paragraph, which is specified in that direction.

The Minerals Planning Authority (MPA) therefore may direct, under article 4 of the GPDO, that an application for planning permission is required for a development that would normally not require planning permission (i.e. in the Schedule 2 list).

Article 7 - Directions Restricting Permitted Development under Class B of Part 22 or Class B of Part 23

If a person informs the MPA that they intend to carry out development such as described in (Schedule 2) Class B of Part 22 & 23 (only), the MPA may, under certain conditions listed in article 7, direct that the permission granted by article 3 of the GPDO shall not apply to this development, or to such part of the development as is specified in the direction.

Effectively if any of the conditions listed in article 7 apply then the MPA must request that planning permission is applied for. Normal allowances of the GPDO under article 3 do not apply.

The aforementioned conditions in article 7 include the condition that if the land on which the development is to be carried out is in a National Park. Therefore article 7 of the GPDO applies to any development within the Peak District National Park described in Class B of Part 22 & 23 of Schedule 2.