APPENDIX 1 - GAZETTEER CONISTON

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1000	Cobblers Level	328815, 498955	17th Century	Site Survey First Edition OS RCHME Survey Holland 1981/89	Good/Stable Some backfill debris but seems stable. Small bush growing on one side of entrance, not currently a problem but should be monitored.	A 17th century adit constructed to drain the Low-Work. This is recorded to be the first hand-driven tunnel at Coniston, taking 3 years to complete. It is a good example of a classic 'Coffin Level' and is easily accessible for visitors. The left-hand branch was driven steeply up to connect the bottom of the working stopes. The tunnel was probably widened at the base in the 18th century.	
1001	Taylors Level	328782, 498951	19th century	Site Survey First Edition OS RCHME Survey Holland 1981/89	Good Entrance partially covered by hill-wash and this is a problem given the proximity of the site to the beck	19th century level, also featured a slate closehead (1910), which might account for some of the external features (Holland 1981, 55). Driven c. 1830.	
1002	Structures associated with Taylors Level	328798, 498941	19th century	Site Survey RCHME Survey Holland 1981/89	Good	Revetment walling and structures on the west bank of Red Dell, associated with Taylor's Level. A rectangular structure described by Holland as the clearance pit for a water wheel located on the stream bed. (Holland 1981, 56). This would have been used to pump out the level. It might also be part of a	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
						winch associated with the quarry.	
1003	Mortar Stone nr. Low Work	328861, 498988	17th Century?	Site Survey	Good Stable but could easily be lost.	Mortar stone located just down slope from Low Work. Probably Elizabethan in date but could be earlier. Use to crush ore by hand.	
1004	Mortar Stone nr. Low Work	328867, 498991	17th Century?	Site Survey	Good Stable but could easily be lost.	Mortar stone located just down slope from Low-Work. Probably Elizabethan in date but could be earlier. Use to crush ore by hand.	
1005	Remains of Low Work	328850, 499026	17th century	Site Survey First Edition OS RCHME Survey Holland 1981/89	Good/Stable Working have been partially backfilled by later mining but are presently stable and show little signs of any subsequent erosion.	Remains of part of the working stopes associated with the Elizabethan Low-Works. Partially backfilled by later works at Bonsor East and Old Engine, but parts of works, following the vein, are still clearly visible.	
1006	Revetment Wall above Old Engine Shaft	328862, 499057	19th century (& earlier)	Site Survey RCHME Survey	Moderate Structures continue to hold back wash but hillside is still eroding in places and the continued pressure on these structures means they are	Series of walls arranged along the hillside above Old Engine shaft and the remains of Low-Works. These are probably 19th century in date and erected to prevent hill wash falling into the structures below. However, some	

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					susceptible to deterioration and need to be regularly monitored. Collapse could threaten remains of Old Engine Wheel Pit below, and block Low Works	of the structures may be earlier in date, possibly 17th century, as there would have been a need to protect the open stopes of Low-Work from hillwash during this period.	
1007	Bonsor East Wheel	328923, 498989	18th Century	Site Survey RCHME Survey Holland 1981	A well preserved group comprising wheel pit, launder pillar and associated building (office/store?) Retaining walls east and south east of wheel pit have collapsed in places and there is a structural bulge in the east wall of the wheel pit. Monitoring recommended.	Wheel erected by Charles Roe of the Macclesfield Copper Company in the mid 18th century to pump out Bonsor East shaft (1055). A new, larger wheel was installed in 1830 which both pumped the mine and raised the ore.	
1008	Bridge	330557, 500864	18th Century?	Site Survey	Destroyed but abutments remain, located in an area disturbed by winter floodwaters. Structure at risk.	Bridge across Red Dell beck providing access to Deep Level, the principal adit connecting the Bonsor and Paddy End workings. Nothing survives of 18th century bridge except pack stone abutments which can be seen on both banks. Just upstream there are the	

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						remains of a later 19th century concrete bridge as well as a number of iron bolts on the west side of the stream. Main bridge probably 18th century but may have been crossing in this location for some time.	
1009	Packhorse track (section of blasted rock)	328910, 498862 328910, 498862 328830, 498936	17th Century	Site Survey	Moderate – relatively stable but under some threat from flood damage in places causing increased erosion.	Packhorse trail leading from dressing floors to bridge. A section of the former packhorse track lies adjacent to existing path but on a much higher level; this is evidence of later blasting reducing the rock in this area. The surviving track section shows a flat path cut through rock with a drain running next to it, similar to the arrangement seen below ground in a number of the 17th century mines.	
1010	Track leading to Low Works	328824, 499037 328874, 498903	17th Century?	Site Survey	Moderate – stable but some signs of erosion.	Track leading up to Low Works and Bonsor East – date unknown but could be packhorse trail associated with Eliz. Mine workings.	
1011	Cobblers Dressing Floors	328817 498941	17th century	Site Survey RCHME	Moderate- some minor flood damage but potentially at risk from erosion along the beck.	Series of dressing floors bounded by revetment pack walls. Feature believed to be 17th century in origin and associated with Low and White Works.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
						There is some suggestion (Peter Fleming pers.com) that there was a stamp mil in this location. This would be the mill referred to in the litigation between the Mines Royal and local tenants over the pollution of the beck (1620). However no extant evidence survives apart from the dressing floor. An alternative location for the 17th century mill is an earlier phase at Red Dell Mill (1060).	
1012	Building	328805, 498989	17th Century?	Site Survey RCHME	Moderate – seems stable but gradual deterioration although no immediate threat.	Two celled stone building orientated E-W. Western gable preserved. Two celled structure – southern side surviving only as footings. Date of building (and adjacent 2013) unknown but could potentially be 17th century and associated with nearby dressing floors and Low Works.	
1013	Building	328808, 499022	17th Century	Site Survey RCHME	Moderate – seems stable but gradual deterioration although no immediate threat.	Building with rear wall blocked by later 18th century spoil indicating structure could be 17th Century. Square in shape with at least two entrances. The northern entrance retains a massive stone lintel. Stub wall extension to the west. The absence of dressing waste in or close to this building and to 1012 suggests a domestic rather than	

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						industrial function, perhaps miners' accommodation or shelters.	
1014	Bonsor East Leat	328914, 499001	18th Century	Site Survey RCHME	Moderate – stable, some gradual erosion but not at immediate risk. Leat grassed over and dry.	Leat supplying Bonsor East Wheel, measures 2m wide and some evidence of stone lining in places. Western end concealed by later spoil but may have once served as an overflow for the Old Engine Shaft Wheel.	
1015	Old Engine Shaft Wheel	328820, 499048	19th century	Site Survey RCHME	Moderate. The revetment wall at the end of the tailrace has partially collapsed and there is a threat of erosion. The first launder pillar is stable, and the second has collapsed. The third launder pillar is the principal site feature and its top was concrete capped by CATMHS in the 1980s and was then the subject of a further, major consolidation programme arranged by the LDNPA with English Heritage funding. It has lost a considerable amount of facing stone on its north eastern face and appears to be listing slightly.	Installed in 1830, and altered in 1850, and again in 1870. Remains of include wheel pit and stone tower for wooden launders supplying water to the overshot wheel. Leat provided water from Red Dell coming in from the north and running out via a tailrace to the south. Wheel used for both pumping the works and raising ore.	 

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					Its overall stability is further compromised by a timber or machinery slot which passes through and weakens the fabric on the south western face. The wheel pit is in good condition but some of the coping stones are displaced. Given the comparatively good survival of this important feature and its dominant landscape position a full structural survey and assessment is suggested.		
1016	Leat for Old Engine Shaft Wheel	328676, 499122 328813, 499064	19th Century	Site Survey RCHME	Good. Stable stone revetting and grassed surface. Low level threat of further erosion where leat crosses Red Dell Beck.	Leat supplying overshot wheel. Leat partially blocked by rid from Lad Stones End slate quarry which was driven in 1910, indicating wheel was probably out of commission by this date.	
1017	Old Engine Shaft Level	328890, 499054	19th century	Site Survey RCHME	Good. Level cut in competent rock and far end securely fenced to allow visitors safe view of shaft top. Longer term threat of further land slip in cutting to northwest of level	Entrance to the Old Engine Level shaft which is 518m ft deep. The shaft was also used for haulage and pumping up to the deep level, superseding the smaller East Bonsor Shaft. Associated with Old Engine shaft wheel (1015) and	

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					entrance.	a wooden trough for housing pump rods or guide wheel is visible in entrance. Iron brackets which once carried a drainage pipe are also visible along the walls of the entrance. The shaft itself is fenced off but the iron sheave wheel, used in winding, is still clearly visible (recently restored by CATHMs). Shaft also features a balance bob plate. Overall depth of drop to base is 425m.	
1018	Bonsor East Wheel Holding Pond	328896, 499005	18th century	Site Survey RCHME	Part of northern section of retaining wall above wheel pit has collapsed. Danger of erosion and further collapse. Monitoring recommended.	Holding pond associated with leat (2014) and East Bonsor Wheel (1007).	
1019	Old Engine Shaft Wheel Tailrace	328767, 499035 328818, 499040	19th century	Site Survey RCHME	Good condition	Tailrace associated with Old Engine Shaft Wheel	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1020	Channel where tailrace crosses beck	328764, 499034	19th Century	Site Survey RCHME Survey First Edition OS	Good – some silting but movement of water keeps channel relatively clear. Gradual erosion of the iron work, but slow deterioration.	Rock cut channel across beck for carrying water from Old Engine Wheel around to Paddy End Mill. Evidence of socket holes and iron fittings indicating maybe some form of wooden trough carrying the water.	
1021	East Bonsor Wheel Tailrace	328925, 498980 328934, 498931	18th Century	Site Survey RCHME Survey First Edition OS	Poor. Retaining wall above tail race has collapsed in places and the channel is partly concealed with tumbled stone. Monitor condition.	Partially revetted channel leading south east down slope from East Bonsor wheelpit.	
1022	Paddy End Leat	328660, 498752 328735, 499046. 328629, 498735 328417 498817	19th century	Site Survey RCHME Survey First Edition OS	Good, some areas disturbed by vegetation but course of feature remains largely evident and well preserved.	Leat running from red Dell beck to the Paddy End Mill. Feature measures approx. 1.5m wide and is cut through rock face in some areas. Leat later re-used in the early 20th century by the French to provide water to the power house. Leat runs underground for a section (328643, 498742), there is also evidence of it water being carried on a wooden trough around rock outcrops – some wooden planks remain in-situ.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1023	Wooden sluice gate	328774, 498844	20th century	Site Survey RCHME Survey	Good but at risk from deterioration	Sluice and wooden sluice gate associated with the early 20th century re-use of the Paddy End leat.	
1024	White Works	328673, 499055	17th Century	Site Survey RCHME Survey	Good/ Stable, area fenced off from public.	Open stopes associated with White-Work mentioned in 17th century documentary references. The area within the fence is ungrassed and has a thick vegetation cover. This may mask and protect areas of early (16th century) hand dressing and ore processing.	
1025	Bonsor Dressing Floors & Upper Mill	328886, 498616	19th Century (c. 1832) and early 20th century (1914)	Site Survey RCHME Survey First Edition OS	Variable – some of the buildings in a poor state of maintenance and a number at considerable risk of collapse. Conifers planted in the 1980s pose a threat to archaeological deposits at west end of site and are visually inappropriate at an	A multi-period site with evidence for a series of copper dressing processes. Complex of terraces, dressing floors, settling tanks, walls and semi-ruinous buildings associated with first phase of dressing. Associated buildings include mine laboratories, blacksmith's shop and saw mill driven by water wheel, the pit of which remains well preserved.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
					industrial monument.	Ore from the Upper mill then sent to Low Mill floors for further processing (1070). The majority of the remaining structures date from the 1830s but there was considerable reuse and alterations in 1914.	
1026	Paddy End Offices	328424, 498834	19th century	Site Survey RCHME Survey First Edition OS	Poor – building damaged when UU Water main burst. Interior full of debris. Much of the rear (north) side of the building has been damaged but the front (south) still stands up to 2m high.	Office shown on RCHME survey as comprising a central bay with small offshot to the north but form is less distinct following collapse. Building entered from the south. Overlooks the Paddy End Dressing Floors.	
1027	Paddy End Smithy	328390, 498836	19th century	Site Survey RCHME Survey First Edition OS	Very Poor – building largely destroyed when water pipe burst.	Shown as a rectangular building on the RCHME survey, with an entrance on the southern side. Today, only the two side walls survive, both long walls being destroyed. The interior is full of loose stone debris.	
1028	Paddy End Dressing Floor	328405, 498754	19th century	Site Survey RCHME Survey First Edition OS Oxford Archaeology North survey	Poor – Moderate – area recently damaged by the burst UU pipe which cut a swathe through a large section of the area. Little direct damage from recent flooding except regarding spoil tips on eastern edge.	A good example, albeit much damaged, of a mid 19thcentury mill complex with a series of integrated processing floors terraced into the hillside.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1029	Courteneys Cross Cut Level	328342, 498851	19th Century	Site Survey RCHME Survey	Good. Level driven in competent rock. Underground access possible.	19th century level driven north east to reach South Vein with internal connection to Deep Level via South Shaft.	
1030	Trial Level	328369, 498850	19th Century	Site Survey RCHME Survey	Moderate – some erosion along the break of slope and possible damage from burst main and some sheep scrapes	Trail level with some pack wall revetment and associated spoil tip but level does not appear to have progressed very far before being abandoned.	
1031	Gaunts level	328453, 498840	19th Century	Site Survey RCHME Survey	Good. Dry stone arched entrance with external cutting, revetted to east. Discharges water. No particular threat.	19th century level driven north under Kernal Crag.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1032	Paddy End Mill	328381, 498821	19th Century	Site Survey RCHME Survey First Edition OS	Moderate/Poor. - Flood and erosion gullies have damaged some of the stone structures and exposed sections of wooden launders. Suggest assessment (including 1028) to determine extent of recent damage using OAU survey as a base line. The OAU survey was carried out prior to conservation work by the LDNPA with funding from United Utilities following the burst water main. Consolidation of track and related drainage might help to control further deterioration.	Group of structures immediately south of track associated with primary ore sorting and crushing. Forms the first stage in the dressing process (integrated with 1028)	
1033	Hospital Level	328296, 498857	19th Century	Site Survey RCHME Survey First Edition OS	Good/Stable, some backfill but this is old. Also some large stones recently brought down from above.	Rock cut level set close behind incline.	
1034	Paddy End Incline	328294, 498853. 328193, 498926.	19th Century	Site Survey RCHME Survey First Edition	Poor – southern end of feature washed away during floods of 2009/10. The result is that the inner core of the	Incline serving middle level and used to transport ore from the mine to the dressing floors below. Incline ran from level, across the beck to the mill. Lower	

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				OS	structure is washed out and the rest will certainly collapse. Feature is preserved further up its course.	sections constructed of an outer stone wall packed with a rubble core. Dismantled in 1877.	
1035	Retaining wall	328238 498911	19th Century	Site Survey RCHME Survey	Moderate, some erosion evident and scree/spoil slopes a gradually moving, obscuring some features.	Short length of revetment wall, standing just over a 1m high. A building and associated return wall shown on RCHME survey but not seen on the ground and probably obscured by scree/spoil slippage.	
1036	Wheel pit	328229, 498937	17th/18th Century?	Site Survey	Moderate – some debris.	Rick cur wheel pit in base of beck, could relate to nearby Hospital Shaft (1038) or possible stamp mill (1037).	
1037	Possible Stamp Mill?	328228, 498931	17th/18th Century?	Site Survey RCHME Survey P. Fleming *pers. com*	Any structures in this area now concealed under spoil slippage. Does not appear to have been the result of recent floods, although this may have aggravated the situation, but a continuous shift of material in this area.	Revetment walls and remaining of a structure shown on RCHME survey. Believed to be part of early stamp mill. Until recently various laminated surfaces of ore laden silts could be seen along the bank but now covered by scree/spoil (Fleming *pers. com*). Ore staining on nearby rocks. Not shown on OS maps so possibly 17th or	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
						18th century.	
1038	Hospital Shaft	328218, 498940	19th Century	Site Survey RCHME Survey	Entrance almost completely lost under spoil slippage, only a fragment of wooden lintel seen above ground	Entrance to Hospital Shaft.	
1039	Pylon base	328255, 498918	19th Century (1878)	Site Survey RCHME Survey Holland 1981 + 1986	Moderate. Substantially intact but location on steep slope poses threat to long term stability.	Square stone platform, a possible pylon base associated with a wire rope haulage system.	
1040	Middle Level Hopper	328210, 498910	19th Century	Site Survey RCHME Survey Holland 1981	Good	Hopper associated with Paddy End Incline. Fittings and Iron rails above survive in-situ	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1041	Middle Level	328184, 498929	19th Century	Site Survey RCHME Survey	Poor. Entrance collapsed and filled with spoil and hill wash.	Level driven to vein complex under Levers Water. Located at head of incline to Paddy End mill. Later connected by ore-passes and internal shafts to Grey Crag level and the dressing floors.	
1042	Grey Crag Level	328286, 498842	19th Century	Site Survey RCHME Survey	Poor. Entrance collapsed.	Principal low level adit for the Paddy End mill until an internal connection - Hospital Shaft – was made with Deep Level.	
1043	Levers Water Bridge	328193, 499010	18th Century	Site Survey RCHME Survey	Destroyed, only abutments visible	Bridge across Levers Water Beck taking ore across to Red Dell Mill	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1044	Sebastian Level	328110, 498988	17th century	Site Survey Fleming pers. com	Buried by later spoil but just visible on the surface	Probable location of Sebastian level, known to have been sunk in 1617 to provide drainage to the numerous working in operation at Simon's Nick (Leverwater).	
1045	Top Level	328159, 498971	19th Century	Site Survey RCHME Survey	Level entrance buried under scree and spoil.	Driven to work the veins under the Back Strings (1050). When first worked ore was taken down slope from the level entrance to the head of the incline at Middle Level.	
1046	Structure	328047, 499049	17th Century	Site Survey RCHME Survey	Stable – some risk to the mortar stones being lost or obscured	Rectangular structure built of rough hewn stones, orientated SW to NW, the north wall formed of natural bedrock. Survives only a couple of courses high. Two mortar stones incorporated into build and at least 2 more located close by. Appears to be hut for dressing ore.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1047	Mortar Stones	328067, 499047	17th Century?	Site Survey	Good but at risk of loss	3 mortar stones found in association with 17th century works. Two more stones found in association with structure 1046	
1048	Trial excavation	328043, 499070	17th Century	Site Survey RCHME Survey	Good	Shallow linear trial excavation close to existing stopes at Simon's Nick	
1049	Location of wooden vat	328067, 499047	17th Century?	Site Survey Fleming pers. com	Recently erected fence runs along the top of the feature and narrowly escaped being driven through with a post.	Circular depression which upon excavation featured the remains of a wooden vat base (see plate 14 of report for excavated vat).	
1050	The Back Strings	328079, 499012	17th Century	Site Survey RCHME Survey Holland 1981 Flemming 2007	Good – previously there was a problem with people throwing stones down the open stopes and dismantling the nearby structures to do so. This has largely been prevented by the fencing. However, location of the fencing does detract from the	Series of open and below ground workings known now as the Backstrings. Originally part of the 17th century mine and comprised a series of seven works each named after the head miner controlling the operation. Numerous shot holes in the area would indicate that the stopes were also widened and worked at a later date.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
					setting and is a risk to the below ground archaeology	Along the east side of the works are a series of structures and spoil tips, the latter being the yellow, ore rich tips associated with early mining. This would appear to be some form of processing area, with one stone built building (1046) and a number of smaller semi-circular shelters, approx. 1.5m in diameter (see photo) which provided some protection for workers who probably sat in the middle smashing and sorting ore before it was sent to the stamp mills for further processing. There are a number of other distinct features but no datable evidence beyond association with works themselves. There might even be pre-17th century evidence of mining here, some of the mortar stones being built into presumably later structures.	

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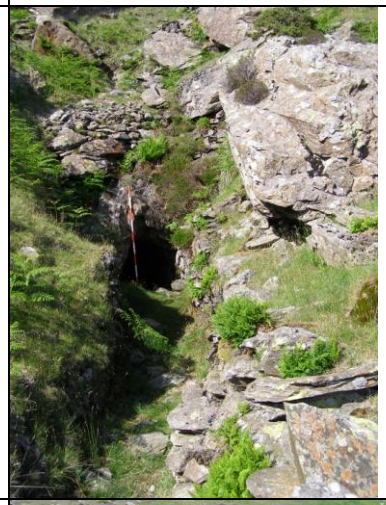
1051	Kernel Crag Level	328450, 498944	18th Century	Site Survey RCHME Survey	Good. Revetted cutting in front of dry stone arched entrance with internal safety gate. Slight threat from scree falling into entrance cutting.	Driven north west to test the vein under Kernel Crag.	
1052	New Engine Shaft Wheel	328621, 499091	18th/19th Century (1850)	Site Survey RCHME Survey Holland 1981	Good - moderate. The wheel pit is in good condition but the launder pillar has partly collapsed. A stone and wood framed pit is built into the launder pillar on the north side and should be monitored for timber deterioration.	Originally the Bonsor West Shaft Wheel, also known as the Millican Wheel which dated to 1820. Replaced by the 'new' Wheel in 1850. Wheel pumped the Thriddle or Bouncy Shaft. To the south are possible remains of Roe's 18th century wheel pit and to the north is the earthwork base of an air compressor erected in the 1880s.	
1053	Spoil from Bonsor East Link tunnel	328911, 498972	19th Century	Site Survey Holland 1981	Good/Stable	Dark grey bedrock spoil overlying the earlier sandy yellow brown vein waste associated with the 17th century Low Work. This is associated with the excavation of a link tunnel between Bonsor East and the Old Engine Shaft.	
1054	Pack horse Track	328552, 499226	17th/18th Century	Site Survey RCHME Survey	Good Stable – some erosion in places	Upper pony track running from the Red Dell Mill, past White Work towards Low Work and from there down the valley	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
				Holland 1981		towards 'Old Man and Old Wife Quarry'. Track measures approx. 1.5m across but varies in width along its course.	
1055	Bonsor East Shaft	328930, 499005	18th Century	Site Survey RCHME Survey Holland 1981	Poor. Entrance is partly blocked and is threatened by erosion and possible collapse of retaining wall at east end of leat holding pond 1018.	Entrance to East Bonsor shaft. Level driven under track 1054 to take pumping flat rods to the underground Bonsor East Shaft. Worked by Bonsor East Wheel.	
1056	Lad Stones Slate Level and Building	328770, 499094	20th century (1910)	Site Survey RCHME Survey Holland 1981	Good/Stable	Small slate closehead driven in 1910. Spoil encroaches on Old Engine Wheel leat implying that latter was out of use by this stage. Small rectangular hut, possibly riving shed, associated with works	
1057	Bridge	328732, 499077	18th century	Site Survey RCHME Survey	Moderate	Footbridge crossing Red Dell Beck	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1058	Bonsor West Shaft (& New Engine Shaft)	328655, 499088	18th Century	Site Survey RCHME Survey Holland 1981		Shaft opened by Charles Roe during the operation of the Macclesfield Copper Company. Shaft contiguous with the fenced off White Works.	
1059	Thriddle Incline	328655, 499088 328602, 499105	19th century	Site Survey RCHME Survey	Poor – Moderate, section of the incline are well preserved but other areas are in a poor state of preservation, particularly near the base. The main problem is the integrity of the outer walls, once these fail then the rubble core will disintegrated into scree. Decline aggravated by foot fall of hikers using the route to access the ridge	Constructed to support a set of rollers which carried pumping rods from New Engine Wheel to the Bouncy mine level which in turn served to pump the horizons of the Flemings, Taylor and Deep levels. Constructed of stone, with a rubble core in-fill.	
1060	Red Dell Dressing Floor	328586, 499215.	17th /18th Century?	Site Survey RCHME Survey Holland 1981	Good. Complex of spoil tips relating to level driving, hand dressing and crushing. Low level erosion threat to east part of site from flooding	Multi period site possible dating to the 17th century, although the mill itself (1061) is probably later	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1061	Red Dell Mill	328556, 499186		Site Survey RCHME Survey Holland 1981 Fleming 2007	Good – moderate. East face of water wheel housing has collapsed but now appears to be in a stable condition. No obvious threat but monitoring recommended.	Holland argues that this a 17th century stamp mill, or possibly the 18th century when it is known from documentary sources that Charles Roe had a mill at the mines. However the holding pond of the present structure appears to overlay the entrance to Fleming Level, known to date to have been driven in 1820. Therefore part of the mill must post-date this. There is also evidence of shot holes on the masonry which would indicate a post 1694 date. Further, the German workings at this time were lower down the valley so they would not carry heavy ore uphill to process it. Based on this evidence it would seem more likely that the mill was constructed by Taylor sometime in the 1830s Nothing survives of the wheel pit suggesting that the wheel would have been a free-standing structure constructed of wood and fed by wooden flumes mounted on stilts. However the remains of a masonry feed channel and lined holding pond can still be seen but these could date	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
						to the mid 19th century.	
1062	Flemings Level	328531, 499172	19th century (1824)	Site Survey RCHME Survey Holland 1981	Good. Original entrance has collapsed but underground access is possible via a new inclined entrance (constructed by CATMHS) which leads directly into the level.	Level driven in 1820	
1063	New Engine Shaft Wheel Leat	328586, 499113 328545, 499171	18th/19th Century	Site Survey RCHME Survey Holland 1981	Good. Stone revetted channel, generally intact. No obvious threat.	Leat associated with New Engine Shaft Wheel (and previously Bonsor West Wheel). Fed by run off from red Dell Stamp Mill	
1064	New Engine Shaft Wheel Holding Pond	328593, 499098	18th/19th Century	Site Survey RCHME Survey Holland 1981	Good. No obvious threat.	Holding pond associated with New Engine Shaft Wheel (and previously Bonsor West Wheel); fed by (leat 1063)	
1065	Red Dell Mill Leat	328572, 499341 328542, 499204	18th Century?	Site Survey RCHME Survey Holland 1981	Good. Open channel, generally intact. Some loss of embankment where leat crosses boggy ground. Remains of low, boulder dam	Leat feeding from Red Dell beck to power stamp mill. Leat drained into a holding pond and then from there was transported via wooden flumes onto a free standing mill and then rain down	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
					at Red Dell Beck possibly at risk from flood damage.	(1063) acting as both tailrace and leat for New Engine Shaft Wheel. Replaced in the 19th century by race from Levers Water.	
1066	Leat running from Levers Water to power Stamp Mill	328187, 499032 328512, 498994 328563, 499105 328524, 499174	19th century	Site Survey RCHME Survey Holland 1981	Good – moderate. Well preserved open channel. Stone revetting in places at western end and a massive support wall in central section. No obvious threat other than erosion through use as footpath.	In the 19th century the Red Dell Beck proved inadequate to drive the new wheel at Bonsor West and a new leat was constructed to bring water from Levers Water along the course of kernel Crag. The leat runs under the Thriddle incline where it passes under a stone bridge, recently restore by CATHMS	
1067	Thriddle or Bouncy Shaft Balance Level	328434, 499136	20th century (1907)	Site Survey RCHME Survey Holland 1981	Good. Level driven in competent rock and the section by the internal shaft head has a safety gate. Potential threat of removal to some of the ironwork associated with the flat rod pumping system.	Primarily a tunnel to drain the deep workings below the Deep Level. Shaft entrance includes a Bob platform, with sections of the Balance bob still intact, and fittings associated with the pump rollers. Ore was not brought out of this level but instead via Fleming's and later Deep Level. The entrance to Bouncy mine proper lies above but is buried.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
							
1068	Glory Hole	328399, 499158	20th century (1907)	Site Survey RCHME Survey Holland 1981	Good. Level driven in competent rock	A trial level, now protected by a gated entrance.	
1069	Tongue Works	328688, 498874	17th Century	Fleming 2007	Moderate	17th century works referred to in contemporary documentary reports located below Kernal Crag. This small working is above the highest point of Tongue Brow on the Kernal Vein.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1070	Bonsor Low Mill & Dressing Floors	329061, 498459	19th Century	Site Survey RCHME Survey Holland 1981	Moderate. Many of the retaining walls and associated features have collapsed or suffered some degree of damage but most now appear to be in a stable condition. The earthwork remains of the jigging, buddling and settling areas are also stable. The main threat to the latter is from vehicle damage and to a lesser extent from flooding. Anecdotal evidence suggests that the large spoil tip south west of the mill is occasionally used as a source of aggregate/hard core. The Low Mill sites cover a comparatively large area with good potential survival of below ground archaeology associated with the final parts of the ore dressing process. It is also the least understood section of the Coniston copper mines complex. Detailed survey and interpretation is	Final phase of processing the ore onsite. A complex of leats, water wheel housings, retaining walls and earthworks associated with concentrating copper ore (jigging, buddling and settling). The dressing floors were laid out by John Barratt in the 1820s, possibly on the site of an earlier mill. Some of the buildings were reused in the 1890s by Warsop's copper smelter .	  

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
					recommended.		
1071	Deep Level	329061 498459	19th Century (1825)	Site Survey RCHME Survey	Good. Arched stone entrance in fair condition. Recent flooding has created two large erosion gullies on the slope above and to either side of the level which could lead to further land slips. Deep Level still drains the mine and blockage of the entrance could lead to a potentially dangerous backup of mine water. The erosion gullies should be monitored, perhaps with advice from a mining engineer regarding the consequences if the level became blocked.	Level started in 1825. Once complete, nearly all of the ore from the mine was transported via deep level using horse drawn wagons.	
1072	Mine's Office	328933, 498561	19th Century	Site Survey RCHME Survey	Good	Former mine's office and now a Youth Hostel	
1073	Mine Managers House and Stable	328969, 498609	19th Century	Site Survey RCHME Survey		Former mine manager's house, now headquarters of the Barrow Mountaineering and Ski Club. Building	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
						has been considerably modified over its history.	
1074	Saw Mill	328934, 498717	19th Century	Site Survey RCHME Survey	Good/Stable but converted and modified – full appraisal not undertaken.	Saw mill with adjacent wheel pit, later used for processing slate and powered by a Pelton wheel fed by a pipeline coming down from the top of the fell. The wheel powered a compressor delivering air to the slate quarries. The Saw mill has been recently converted into holiday cottages. Later became the generating and electro-precipitation house for the French 'Coniston Electrolytic Copper Company' until 1914.	
1075	Powder Store	328794, 498601	19th Century	Site Survey RCHME Survey	Appraisal not undertaken	Recently converted into a private dwelling lived in by the landowner	
1076	Building (blacksmith's shop?)	328645, 499077	18th/19th century	Site Survey RCHME Survey (building 104)	Moderate. Foundations only.	Rectangular building 4.4m x 3.5m, reduced to foundations, with entrance in south east corner. Quantities of cinders suggest use as blacksmith's shop.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1077	Copper slag blocks	329064, 498501	19th century (1893)	Site survey Holland 1987	Good	Group of cylindrical blocks of copper slag close to site of Warsop's copper smelter. The smelter was destroyed in a storm in 1894.	
1078	Sheepfold	329021, 498599	18th/19th century	Site Survey RCHME Survey	Good	Two celled dry stone sheepfold with D-shaped enclosure to the north east.	
1079	Bonsor Ventilation Level	328952, 499015	19th cent	Site Survey Holland 1981	Moderate. Level driven in competent rock. Some erosion on south west face of spoil tip.	Above the track and north of Bonsor East Wheel, a level driven to the top of the Bonsor Vein.	
1080	Possible location of Jack Roll	328093, 499000	16/17th Century?	Site Survey	Good, but on edge of open stope so prone to erosion	Possible location of a Jack Roll. Comprises a rectilinear depression adjacent to openwork at Simon's Nick. Maybe associated with drainage and hauling ore up to the surface from the Back Strings.	

ID No	Type	NGR	Date	Source	Conditions Risks/Issues	Description	Image
1081	Pelton Wheel pipeline	328809, 498813 328917, 498736	19th century	Site Survey Holland 1981	Moderate, vestiges of the wheel still remain as do structures relating to the pipeline	Pelton wheel fed by a pipeline from Lever Water. Erected in the 1880s to power the Bonsor Saw Mill.	

APPENDIX 2: A GLOSSARY OF COPPER MINING TERMS[1]

ADIT	A level tunnel (usually driven into a hillside) in order to give access to a mine, and used for drainage or the hauling of broken ore. Deeper adits did not necessarily connect to surface, and were used to carry water back from distant workings to a pumping shaft.
BALANCE BOB	A large counterweighted lever attached to the shaft pump rods and used to offset their weight and thus reduce the work of a pumping engine to lifting water alone. A surface balance bob would be mounted adjacent to the shaft on a pair of plinths or on a masonry support at ground level (balance bob mounting), the attached counterweight - a large box filled with scrap iron or rocks - working in an adjacent stone-lined pit. Other balance bobs would be installed in chambers cut into the rock adjacent to the shaft wall as needed to counterbalance the weight of the pump rods, especially on a deep shaft.
BAL-MAID	A woman or girl employed at surface on a mine, generally in the dressing of ore.
BUCKING	The breaking down of copper ore on an anvil to about 10mm in diameter by bal-maids using small hammers, after which the ore was separated from the waste by hand. This process followed cobbing, in which it had been broken down to about 25mm in diameter, the waste again being hand removed. These processes, through which the majority of the highest quality copper ore was recovered, took place within roofed structures called bucking houses.
BUDDLE	A device for concentrating ore. In the mid-19th century these most usually took the form of a circular pit with rotating brushes; the tin from the stamps was fed into the centre or side of the pit and was graded by gravity, concentrating the heavy ore near the inlet point. These were often mechanically worked. Earlier buddles were trapezoidal in shape, and manually operated. A variation used in tailings works to treat sands and slimes was the ROUND FRAME: a free-standing, all wooden, mechanically-actuated buddle, whilst a further variation was the dumb buddle or dumb pit, which were not mechanically operated.
CLOSE HEAD	Underground Slate Quarry

[1] Glossary adapted from ' A short Glossary of Cornish Mining Terms' citing online reference http://www.cornish-mining.org.uk/story/glossary.htm, accessed 10/09/10

COFFIN LEVEL	The narrow excavation resulting from stoping on a lode being carried to or from surface on part or all of a lode.
CONDENSER	The cast-iron cylinder set in a tank of cold water immediately in front of the bob wall of an engine house in which the exhaust steam was condensed, creating a vacuum which greatly increased the efficiency of a steam engine. For a pumping engine this equipment was often contained within a pair of masonry walls projecting from the bob wall towards the shaft.
CULVERT	A small tunnel constructed to carry a channel of water.
DRESSING	The concentration of the tin (copper or other ores) contained in the rock excavated from the stopes of a mine. Carried out on DRESSING FLOORS.
DRESSING FLOORS	An (often extensive) surface area on a mine where the various processes of concentration of ore took place - these consisted of crushing or stamping to attain a uniform size range, sizing (particularly on later mines), separation of waste rock, concentration (generally mechanically and hydraulically on tin mines, manually on copper mines), the removal of contaminant minerals (by calcination, flotation, magnetic separation), and finally drying and bagging for transportation to the smelter. Tin floors in particular were generally laid out down a slope to reduce mechanical or manual handling between stages in the process.
DRIVE	(alternatively lode drive or heading). A tunnel excavated on the line of a lode as the first stage of the development of a STOPE.
DUMP or BURROW (alternatively spoil dump, spoil tip).	A pile of waste material, usually from a mine or quarry. May contain primary waste (where this could not be disposed of underground) or waste from various stages in the dressing process. TAILINGS LAGOONS stored the extensive slimes from the final stages in the process; in earlier mines these were flushed over cliffs or allowed to wash away in streams or rivers.
FINGER DUMP	A linear dump of waste material from a mine or quarry, flat-topped to allow material to be barrowed or trammed along it, and often equipped with a temporary tramway track.
FLAT RODS	Reciprocating (or very occasionally rotative) iron rods used to transfer

	power from a steam-engine or water-wheel to a remote location.
FLUE	A masonry-constructed tunnel or conduit connecting a furnace to a chimney stack
GIRDER	The massive timber beam set across an engine house just below top floor level to which the parallel motion was attached and on which the spring beams sat.
HEADFRAME	The tall construction set over a winding shaft which carried the sheave wheels over which the winding ropes ran. Headframes usually contained ore bins or ore chutes to allow the broken rock in the skips or kibbles to be tipped into trams at surface.
HORSE GIN	Power supplied by a horse walking around a circular platform was applied to an overhead winding drum; frequently used for winding from small shafts, especially during exploratory work and shaft sinking.
JIG	A large mechanically or hand-operated sieve set in a tank of water using which ore could be separated by waste. Sometimes constructed in groups within jigging houses.
KIBBLE	A large, strongly-constructed, egg-shaped, iron container used for ore and rock haulage in earlier shafts. Superseded by SKIPS.
LAUNDER	A wooden or steel trough used to carry water or other liquids; often used to feed water or finely-divided material in suspension around a dressing floor.
LEAT	An artificial water-course, built to carry a supply of water to a mine.
LODE	A linear area of mineralisation underground. Sometimes referred to as a VEIN, or SEAM. Generally vertical or near-vertical, and often extending for considerable distances along its strike.
MAGAZINE	Small strongly built store containing explosives (gunpowder or dynamite); often circular, sometimes with additional enclosing walls to contain the blast of an accidental explosion.
OPENWORK	A mineral extraction site open to the surface, and similar to a quarry but usually distinguished by its elongated shape, and steep sides.
OVERBURDEN	The topsoil and subsoil removed in the process of opening or extending

	a quarry, streamworks or mine.
PELTON WHEEL	A small enclosed water turbine, working at high pressure and rotational speeds. In use from the later 19th century.
PITWORK	The term used to describe the pump rods, rising main, shaft guides (buntings) etc. within a shaft.
PROSPECTING PIT OR FOSSICKING PIT	A small pit dug in search of minerals, and almost always found in linear groups, often arranged cross-contour, or at right angles to the projected strike of known lodes.
SHAFT	A vertical or near-vertical tunnel sunk to give access to the extractive areas of a mine.
SKIP	A (generally elongated) iron or steel container equipped with small wheels or brackets running on the shaft guides (buntings) and used for rock and ore haulage in later mines.
STAMPS	A mechanical device for crushing ore-bearing rock to a fine sand. Heavy vertically-mounted beams (or later iron rods) carrying cast or forged iron heads were sequentially lifted and dropped onto the prepared ore beneath them by a series of cams mounted on a rotating drum; this usually being driven by a water-wheel or rotative steam engine.
STOCKWORKS	A complex system of structurally controlled or randomly oriented veins. Stockworks are common in many ore deposit type; they are also referred to as stringer zones
STOPE	Excavated area produced during the extraction of ore-bearing rock. Often narrow, deep and elongated, reflecting the former position of the lode. Where open to the surface, these are termed OPENWORK
TAILINGS	The waste sand and slime from a mine dressing floor, not containing workable quantities of mineral.
TAILRACE	The channel along which water flows after having passed over or under a water-wheel and is then generally returned to the water course.
TRIBUTE	A system of payment in which groups of miners bid against one another for contracts to work sections of the mine for a percentage of the value of the ore raised from that area.

WATER-WHEEL	Wheel fitted with buckets or paddles around its periphery, and driven by the weight or force of a stream of water directed onto them.
WHEELPIT	A structure built to house a water-wheel, often excavated and stone-lined, but sometimes free-standing.

APPENDIX 3: QUESTIONNAIRE

Coniston Copper Mines Questionnaire

Please complete and return to us by the **31st of August 2010**

Q1: How often do you visit the copper mines?	
Never been	
I have been once	
I have been two or three times	
I visit a number of times a year	
I visit regularly (ie. every month)	

Q2: How far have you come?	
I live near the site (within 10 miles)	
I live in Cumbria	
I live in the North West	
I am on holiday in the area	
I am visiting for the day/weekend	

Q3: Why do you visit Coniston?	
To see the copper mines.	
I go there to get access up onto the fells	
It is a great place to walk and get some exercise	
I go to enjoy the natural environment.	
It is a good place to have a picnic and bring the family	
I take part in underground mines exploration	
I stay in the holiday accommodation	
I stay in the youth hostel	

Are there any other reasons you visit the site?

Q4: What do you think makes the site important	Agree strongly	Agree	Disagree	Disagree strongly	Don't know
The archaeology and history of the Copper mines					
The below ground archaeology of the mines					
The wildness of the fells					
Access to great walks					
The flora, fauna and/or geology					
The youth hostel					
It is a good educational resource					

Are there any other things which make the site important to you?

Q5: What do you think are the most important issues facing the mines?	Agree strongly	Agree	Disagree	Disagree strongly	Don't know
Poor access road and parking					
Condition of the standing remains					
Lack of information on the mines					
Poor footpaths and routes					
Limited access to some areas of the site					
Threats to the setting and views around the site					
Health and safety issues					
Flood damage					
Vandalism and litter					

Is there anything which we have left out which you consider an issue, or potential threat, to the site:

Q6: What do you think are the three most important improvements that could be made to enhance and protect the copper mines
1. 2. 3.

Anything other improvements you would like to see?

Penny Rigg Quarry and Copper Mill

As part of a related project we are also looking at the Penny Rigg copper mill and slate quarries over at Tilberthwaite.

Q1: Have you ever visited the Penny Rigg site?	
Never been	
Yes, once	
I have been two or three times	
I visit a number of times a year	
I visit regularly (ie. every month)	

Q2: What prompted your visit?	
To see the copper mill and quarry	
I go there to go climbing	
It is a great place to walk and get some exercise	
I go to enjoy the natural environment.	
It is a good place to have a picnic and bring the family	
I take part in underground mines exploration	

Are there any other reasons you visit the site?

Q3: What do you think makes the site important	Agree strongly	Agree	Disagree	Disagree strongly	Don't know
The archaeology and history of the mill and quarry					
The below ground archaeology of the mine/quarry					
The wildness of the area					
Access to great walks					
The flora, fauna and geology					
It is a good educational resource					

Are there any other things which make the site important to you?

Q4: What do you think are the most important issues facing the mines?	Agree strongly	Agree	Disagree	Disagree strongly	Don't know
Condition of the standing remains					
Lack of information on the mill/quarry					
Poor footpaths and routes					
Health and safety concerns					
Threats to the setting and views around the site					
Flood damage					
Vandalism and litter					

Is there anything which we have left out which you would consider an issue or potential threat to the site:

Q4: What do you think are the three most important improvements that could be made to enhance and protect the copper mines

1. 2. 3.

Anything other improvements you would like to see?

Please complete your details if you would like to stay involved with project and be informed of any updates; neither Archaeo-Environment nor the LPNPA will not pass on your details to anyone else:

Name: …… Email address: ……

Address: ……

…… Tel:…… ……..

Thanks for your help

PLEASE RETURN ALL COMPLETED FORMS BY THE 31ST OF AUGUST 2010.

APPENDIX 4 – Conditions Summary

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
1001	Taylors Level	328782, 498951	19th century	Good	Entrance partially covered by hill-wash and this is a problem given the proximity of the site to the beck
1002	Structures associated with Taylors Level	328798, 498941	19th century	Good	
1003	Mortar Stone nr. Low Work	328861, 498988	17th Century?	Good	Stable but could easily be lost.
1004	Mortar Stone nr. Low Work	328867, 498991	17th Century?	Good	Stable but could easily be lost.
1005	Remains of Low Work	328850, 499026	17th century	Good	Working have been partially backfilled by later mining but are presently stable and show little signs of any subsequent erosion.
1016	Leat for Old Engine Shaft Wheel	328676, 499122 328813, 499064	19th Century	Good	Stable stone revetting and grassed surface. Low level threat of further erosion where leat crosses Red Dell Beck.
1017	Old Engine Shaft level	328890, 499054	19th century	Good	Level cut in competent rock and far end securely fenced to allow visitors safe view of shaft top. Longer term threat of further land slip in cutting to northwest of level entrance.
1019	Old Engine Shaft Wheel Tailrace	328767, 499035 328818, 499040	19th century	Good	Good condition
1020	Channel where tailrace crosses beck	328764, 499034	19th Century	Good	Some silting but movement of water keeps channel relatively clear. Gradual erosion of the iron work, but slow deterioration.
1022	Paddy End Leat	328660, 498752	19th century	Good	Some areas disturbed by vegetation but course of feature remains largely evident and well preserved.

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
		328735, 499046. 328629, 498735 328417 498817			
1023	Wooden sluice gate	328774, 498844	20th century	Good	Good but at risk from deterioration
1024	White Works	328673, 499055	17th Century	Good	Good/ Stable, area fenced off from public.
1029	Courteneys Cross Cut Level	328342, 498851	19th Century	Good	Level driven in competent rock. Underground access possible.
1031	Gaunts level	328453, 498840	19th Century	Good	Dry stone arched entrance with external cutting, revetted to east. Discharges water. No particular threat.
1033	Hospital Level	328296, 498857	19th Century	Good	Good/Stable, some backfill but this is old. Also some large stones recently brought down from above.
1040	Middle Level Hopper	328210, 498910	19th Century	Good	
1046	Structure	328047, 499049	17th Century	Good	Stable – some risk to the mortar stones being lost or obscured
1047	Mortar Stones	328067, 499047	17th Century?	Good	Good but at risk of loss
1048	Trial excavation	328043, 499070	17th Century	Good	
1050	The Back Strings	328079, 499012	17th Century	Good	Previously there was a problem with people throwing stones down the open stopes and dismantling the nearby structures to do so. This has largely been prevented by the fencing. However, location of the fencing does detract from the setting and is a risk to the below

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
					ground archaeology
1051	Kernel Crag Level	328450, 498944	18th Century	Good	Revetted cutting in front of dry stone arched entrance with internal safety gate. Slight threat from scree falling into entrance cutting.
1052	New Engine Shaft Wheel	328621, 499091	18th/19th Century (1850)	Good	Good - moderate. The wheel pit is in good condition but the launder pillar has partly collapsed. A stone and wood framed pit is built into the launder pillar on the north side and should be monitored for timber deterioration.
1053	Spoil from Bonsor East Link tunnel	328911, 498972	19th Century	Good	
1054	Pack horse Track	328552, 499226	17th/18th Century	Good	Some erosion in places
1056	Lad Stones Slate Level and Building	328770, 499094	20th century (1910)	Good	Good/Stable
1060	Red Dell Dressing Floor	328586, 499215.	17th /18th Century?	Good	Complex of spoil tips relating to level driving, hand dressing and crushing. Low level erosion threat to east part of site from flooding
1061	Red Dell Mill	328556, 499186	Various?	Good	Good – moderate. East face of water wheel housing has collapsed but now appears to be in a stable condition. No obvious threat but monitoring recommended.
1062	Flemings Level	328531, 499172	19th century (1824)	Good	Original entrance has collapsed but underground access is possible via a new inclined entrance (constructed by CATMHS) which leads directly into the level.
1063	New Engine Shaft Wheel Leat	328586, 499113 328545, 499171	18th/19th Century	Good	Stone revetted channel, generally intact. No obvious threat.
1064	New Engine Shaft Wheel	328593, 499098	18th/19th Century	Good	No obvious threat.

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
	Holding Pond				
1065	Red Dell Mill leat	328572, 499341 328542, 499204	18th Century?	Good	Open channel, generally intact. Some loss of embankment where leat crosses boggy ground. Remains of low, boulder dam at Red Dell Beck possibly at risk from flood damage.
1066	Leat running from Levers Water to power Stamp Mill	328187, 499032 328512, 498994 328563, 499105 328524, 499174	19th century	Good	Good – moderate. Well preserved open channel. Stone revetting in places at western end and a massive support wall in central section. No obvious threat other than erosion through use as footpath.
1067	Thriddle or Bouncy Shaft Balance Level	328434, 499136	20th century (1907)	Good	Level driven in competent rock and the section by the internal shaft head has a safety gate. Potential threat of removal to some of the ironwork associated with the flat rod pumping system.
1068	Glory Hole	328399, 499158	20th century (1907)	Good	Level driven in competent rock
1071	Deep Level	329061 498459	19th Century (1825)	Good	Arched stone entrance in fair condition. Recent flooding has created two large erosion gullies on the slope above and to either side of the level which could lead to further land slips. Deep Level still drains the mine and blockage of the entrance could lead to a potentially dangerous backup of mine water. The erosion gullies should be monitored, perhaps with advice from a mining engineer regarding the consequences if the level became blocked.
1072	Mine's Office	328933, 498561	19th Century	Good	

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
1073	Mine Managers House and Stable	328969, 498609	19th Century	Good	
1074	Saw Mill	328934, 498717	19th Century	Good	Good/Stable but converted and modified – full appraisal not undertaken.
1077	Copper slag blocks	329064, 498501	19th century (1893)	Good	
1078	Sheepfold	Location?	18th/19th century	Good	
1080	Possible location of Jack Roll	328093, 499000	16/17th Century?	Good	Good, but on edge of open stope so prone to erosion
1000	Cobblers Level	328815, 498955	17th Century	Good/Stable	Good/Stable
1006	Revetment Wall above Old Engine Shaft	328862, 499057	19th century (& earlier)	Moderate	Structures continue to hold back wash but hillside is still eroding in places and the continued pressure on these structures means they are susceptible to deterioration and need to be regularly monitored. Collapse could threaten remains of Old Engine Wheel Pit below, and block Low Works
1007	Bonsor East Wheel	328923, 498989	18th Century	Moderate	A well preserved group comprising wheel pit, launder pillar and associated building (office/store?) Retaining walls east and south east of wheel pit have collapsed in places and there is a structural bulge in the east wall of the wheel pit. Monitoring recommended.
1009	Packhorse track (section of blasted rock)	328910, 498862 328910, 498862	17th Century	Moderate	Relatively stable but under some threat from flood damage in places causing increased erosion.

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
		328830, 498936			
1010	Track leading to Low Works	328824, 499037 328874, 498903	17th Century?	Moderate	Stable but some signs of erosion.
1011	Cobblers Dressing Floors	328817 498941	17th century	Moderate	Some minor flood damage but potentially at risk from erosion along the beck.
1012	Building	328805, 498989	17th Century?	Moderate	Seems stable but gradual deterioration although no immediate threat.
1013	Building	328808, 499022	17th Century	Moderate	Seems stable but gradual deterioration although no immediate threat.
1014	Bonsor East Leat	328914, 499001	18th Century	Moderate	Stable, some gradual erosion but not at immediate risk. Leat grassed over and dry.
1015	Old Engine Shaft Wheel	328820, 499048	19th century	Moderate	The revetment wall at the end of the tailrace has partially collapsed and there is a threat of erosion. The first launder pillar is stable, and the second has collapsed. The third launder pillar is the principal site feature and its top was concrete capped by CATMHS in the 1990s. It has lost a considerable amount of facing stone on its north eastern face and appears to be listing slightly. Its overall stability is further compromised by a timber or machinery slot which passes through and weakens the fabric on the south western face. The wheel pit is in god condition but some of the coping stones are displaced. Given the comparatively good survival of this important feature and its dominant landscape position a full structural survey and assessment is suggested.
1030	Trial Level	328369, 498850	19th Century	Moderate	Some erosion along the break of slope and possible damage from burst main and some sheep scrapes
1035	Retaining wall	328238	19th	Moderate	Some erosion evident and scree/spoil slopes a gradually moving, obscuring some

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
		498911	Century		features.
1036	Wheel pit	328229, 498937	17th/18th Century?	Moderate	Some debris.
1039	Pylon base	328255, 498918	19th Century (1878)	Moderate	Substantially intact but location on steep slope poses threat to long term stability.
1057	Bridge	328732, 499077	18th century	Moderate	
1070	Bonsor Low Mill Dressing Floors	329061, 498459	19th Century	Moderate	Many of the retaining walls and associated features have collapsed or suffered some degree of damage but most now appear to be in a stable condition. The earthwork remains of the jigging, buddling and settling areas are also stable. The main threat to the latter is from vehicle damage and to a lesser extent from flooding. Anecdotal evidence suggests that the large spoil tip south west of the mill is occasionally used as a source of aggregate/hard core. The Low Mill sites covers a comparatively large area with good potential survival of below ground archaeology associated with the final parts of the ore dressing process. It is also the least understood section of the Coniston copper mines complex. Detailed survey and interpretation is recommended.
1076	Building (blacksmith's shop?)	328645, 499077	18th/19th century	Moderate	Foundations only.
1079	Bonsor Ventilation Level	Location?	19th cent	Moderate	Level driven in competent rock. Some erosion on south west face of spoil tip.
1081	Pelton Wheel pipeline	328809, 498813 328917, 498736	19th century	Moderate	Vestiges of the wheel and pipeline survive i*n-situ*
1008	Bridge	330557,	18th	Poor	Destroyed but abutments remain, located in an area disturbed by winter floodwaters.

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
		500864	Century?		Structure at risk.
1018	Bonsor East Wheel Holding Pond	328896, 499005	18th century	Poor	Part of northern section of retaining wall above wheel pit has collapsed. Danger of erosion and further collapse. Monitoring recommended.
1021	East Bonsor Wheel Tailrace	328925, 498980 328934, 498931	18th Century	Poor	Retaining wall above tail race has collapsed in places and the channel is partly concealed with tumbled stone. Monitor condition.
1025	Bonsor Dressing Floors (Upper Mill)	328886, 498616	19th Century (c. 1832) and early 20th century (1914)	Poor	Variable – some of the buildings in a poor state of maintenance and a number at considerable risk of collapse. Conifers planted in the 1980s pose a threat to archaeological deposits at west end of site and are visually inappropriate at an industrial monument.
1026	Paddy End Offices	328424, 498834	19th century	Poor	Building damaged when UU Water main burst. Interior full of debris. Much of the rear (north) side of the building has been damaged but the front (south) still stands up to 2m high.
1027	Paddy End Smithy	328390, 498836	19th century	Poor	Very Poor – building largely destroyed when water pipe burst.
1028	Paddy End Dressing Floor	328405, 498754	19th century	Poor	Area recently damaged by the burst UU pipe which cut a swathe through a large section of the area. Little direct damage from recent flooding except regarding spoil tips on eastern edge.
1032	Paddy End Mill	328381, 498821	19th Century	Poor	Poor/Moderate. Flood and erosion gullies have damaged some of the stone structures and exposed sections of wooden launders. Suggest assessment (including 1028) to determine extent of recent damage using OAU survey as a base line. Consolidation of track and

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
					related drainage might help to control further deterioration.
1034	Paddy End Incline	328294, 498853. 328193, 498926.	19th Century	Poor	Southern end of feature washed away during floods of 2009/10. The result is that the inner core of the structure is washed out and the rest will certainly collapse. Feature is preserved further up its course.
1037	Possible Stamp Mill?	328228, 498931	17th/18th Century?	Poor	Any structures in this area now concealed under spoil slippage. Does not appear to have been the result of recent floods, although this may have aggravated the situation, but a continuous shift of material in this area.
1038	Hospital Shaft	328218, 498940	19th Century	Poor	Entrance almost completely lost under spoil slippage, only a fragment of wooden lintel seen above ground
1041	Middle Level	328184, 498929	19th Century	Poor	Entrance collapsed and filled with spoil and hill wash.
1042	Grey Crag Level	328286, 498842	19th Century	Poor	Entrance collapsed.
1043	Levers Water bridge	328193, 499010	18th Century	Poor	Destroyed, only abutments visible
1044	Sebastian Level	328110, 498988	17th century	Poor	Buried by later spoil but just visible on the surface
1045	Top Level	328159, 498971	19th Century	Poor	Level entrance buried under scree and spoil.
1055	Bonsor East Shaft	328951, 499013	18th Century	Poor	Entrance is partly blocked and is threatened by erosion and possible collapse of retaining wall at east end of leat holding pond 1018.
1059	Thriddle Incline	328655, 499088 328602, 499105	19th century	Poor	Poor – Moderate, section of the incline are well preserved but other areas are in a poor state of preservation, particularly near the base. The main problem is the integrity of the outer walls, once these fail then the rubble core just disintegrated into scree. Decline aggravated by foot fall of hikers using the route to access the ridge
1049	Location of	328067,	17th	Unknown	Unknown. Recently erected fence runs along the top of the feature and narrow escaped

ID No	Type	NGR	Date	Condition	Conditions Risks/Issues
	wooden vat	499047	Century?		being driven through with a post.
1058	Bonsor West Shaft	328655, 499088	18th Century	Unknown	
1069	Tongue Works	328688, 498874	17th Century	Unknown	Not Found
1075	Powder Store	328794, 498601	19th Century	Unknown	Appraisal not undertaken

APPENDIX 5: CONSERVATION OBJECTIVES and DEFINITIONS OF FAVOURABLE CONDITION for DESIGNATED FEATURES OF INTEREST:

These Conservation Objectives relate to all designated features on the SSSI, whether designated as SSSI, SPA, SAC or Ramsar features.

Name of Site of Special Scientific Interest (SSSI)	
Coniston Mines and Quarries SSSI	
Names of designated international sites	
Special Area of Conservation (SAC)	N/A
Special Protection Area (SPA)	N/A
Ramsar :	N/A
Relationship between site designations	

Version Control information	
Status of this Version (Draft, Consultation Draft, Final)	Consultation Draft
Prepared by:	Rhiannon George, Bart Donato
Date of this version:	27 August 2008
Date of generic guidance on favourable condition used:	August 2006
Other notes/version history :	Draft 1 by Bart Donato, 26 March 2006. Draft 2: 9 April 2008, R George - updated to include map, new guidance and comments by Mick Murphy. Geological codes amended by KS on 27 Aug 08.

Quality Assurance information		
Checked by	**Name: Karen Slater**	**Date: 27 August 2008**
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Conservation Objectives and definitions of Favourable Condition: notes for users

Conservation Objectives

SSSIs are notified because of specific biological or geological features. Conservation Objectives define the desired state for each site in terms of the features for which they have been designated. When these features are being managed in a way which maintains their nature conservation value, then they are said to be in 'favourable condition'. It is a Government target that 95% of the total area of SSSIs should be in favourable condition by 2010.

Definitions of Favourable Condition

The Conservation Objectives are accompanied by one or more habitat extent and quality definitions for the special interest features at this site. These are subject to periodic reassessment and may be updated to reflect new information or knowledge; they will be used by Natural England and other relevant authorities to determine if a site is in favourable condition. The standards for favourable condition have been developed and are applied throughout the UK.

Use under the Habitats Regulations

The Conservation Objectives and definitions of favourable condition for features on the SSSI may inform the scope and nature of any 'appropriate assessment' under the Habitats Regulations. An appropriate assessment will also require consideration of issues specific to the individual plan or project. The habitat quality definitions do not by themselves provide a comprehensive basis on which to assess plans and projects as required under Regulations 20-21, 24, 48-50 and 54 - 85. The scope and content of an appropriate assessment will depend upon the location, size and significance of the proposed project. Natural England will advise on a case by case basis.

Following an appropriate assessment, competent authorities are required to ascertain the effect on the integrity of the site. The integrity of the site is defined in para C10 of PPG9 as the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified. The determination of favourable condition is separate from the judgement of effect upon integrity. For example, there may be a time-lag between a plan or project being initiated and a consequent adverse effect upon integrity becoming manifest in the condition assessment. In such cases, a plan or project may have an adverse effect upon integrity even though the site remains in favourable condition.

The formal Conservation Objectives for European Sites under the Habitats Regulations are in accordance with para. C10 of PPG 9, the reasons for which the European Site was classified or designated. The entry on the Register of European Sites gives the reasons for which a European Site was classified or designated.

Explanatory text for Tables 2 and 3

Tables 2 and 3 set out the measures of condition which we will use to provide evidence to support our assessment of whether features are in favourable condition. They are derived from a set of generic guidance on favourable condition prepared by NE specialists, and have been tailored by local staff to reflect the particular characteristics and site-specific circumstances of individual sites. Quality Assurance has ensured that such site-specific tailoring remains within a nationally consistent set of standards. The tables include an audit trail to provide a summary of the reasoning behind any site-specific targets etc. In some cases the requirements of features or designations may conflict; the detailed basis for any reconciliation of conflicts on this site may be recorded elsewhere.

Conservation Objectives

The Conservation Objectives for this site are, subject to natural change, to maintain the following habitats and geological features in favourable condition (*), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated (SSSI, SAC, SPA, Ramsar) as individually listed in Table 1.

Habitat Types represented (Biodiversity Action Plan categories)

[Not applicable at this site]

Geological features (Geological SiteTypes)

INLAND OUTCROPS (EO)
FINITE MINERAL, FOSSIL OR OTHER GEOLOGICAL (FM)
FINITE UNDERGROUND MINES AND TUNNELS (FU)
MINE DUMPS (FD)

(*) or restored to favourable condition if features are judged to be unfavourable.

Standards for favourable condition are defined with particular reference to the specific designated features listed in Table 1, and are based on a selected set of attributes for features which most economically define favourable condition as set out in Table 2 and Table 3:

Table 1 Individual designated Special Interest Features

BAP Broad Habitat type / Geological Site Type	Specific designated features	Explanatory description of the feature for clarification	SSSI designated interest features
FINITE MINERAL, FOSSIL AND OTHER GEOLOGICAL (FM) FINITE UNDERGROUND MINES AND TUNNELS (FU)	Mineralogy of the Lake District	The Coniston Copper Mines comprise a large group of abandoned workings in the Copper Mines Valley northwest of the village of Coniston. These worked polyphase Cu-Pb-Zn-As-Co-Ni deposits are fine examples of the major primary vein mineralisation of the Lake District chalcopyrite-pyrite-arsenopyrite suite. The typical assemblage is quartz, chlorite, chalcopyrite, arsenpyrite, tenanite and pyrite with abundant magnetite in the Bonser vein. Material from the Bonser vein is diverse including various bismuth minerals and the first British occurrence of laitakerite.	*
MINE DUMPS (FD)	Mineralogy of the Lake District	Mine dumps in the site provide access to the minerals described above. The most important areas of dump material are those which can be correlated with the vein from which they were derived and these include the upper dumps on Paddy End Vein and those along the line of Bonser Vein. The upper dumps on Paddy End Vein also contain the best examples of supergene mineralisation exposed at surface though there are areas underground where there are excellent examples of copper-rich flowstone which are worthy of protection. The large dumps near the Youth Hostel and below Hospital Level contain material from the lower workings on both main veins.	*
INLAND OUTCROPS (EO)	Ordovician – Silurain Igneous	The outcrops at this site demonstrate the character of the mid-Ordovician Borrowdale Volcanic Group in the southern Lake District. The exposures include tuffs, andesitic peperitic sills, ignimbrites and breccias produced by ancient mud flows. The composite welded ash-flow tuffs of Long Crag are of particular interest. The exposures belong to the last phase of volcanism and represent three different beds namely the Tilbertwaite Tuffs (formerly Yewdale Beddded tuffs), Wrengill Andesite and the Yewdale Breccia. The exposures are important for the interpretation of late Borrowdale volcanic environments.	*

NB. 1). Features where asterisks are in brackets (*) indicate habitats which are not notified for specific habitat interest (under the relevant designation) but because they support notified species. 2) The requirements of species (including SPA bird species) are reflected in the Conservation Objectives for habitat features on which they depend. In some specific situations, direct population measures for species may also be used to provide supporting information to confirm habitat quality measures.

Table 2 Habitat Features - Extent Objectives

N/A

Table 3 Site-Specific definitions of Favourable Condition

CONSERVATION OBJECTIVE FOR THIS HABITAT / GEOLOGICAL SITE-TYPE	To maintain the **FINITE MINERAL, FOSSIL OR OTHER GEOLOGICAL (FM), FINITE UNDERGROUND MINES AND TUNNELS (FU), MINE DUMPS (ID), and INLAND OUTCROPS (EO)** at this site in favourable condition, for continued scientific research and education into mineralisation of the Lake District. Favourable condition is defined at this site in terms of the following site-specific standards:
Site-specific details of any geographical variation or limitations (where the favourable condition standards apply)	
The two main veins (the Bonser Vein at the north of the site and the Paddy End Vein in the west) run south east from Levers Water for approximately 900 metres. The mine and mine dump areas are restricted to the western portion of the site (see map), the key outcrops and exposures are found on the eastern portion of the site. Standards apply to only to mines, mine dumps and key geological exposures. The eastern portion of the site contains the Borrowdale Volcanic Group exposures in low-lying glacially-eroded upland outcrops.	
Site-specific standards defining favourable condition	

Criteria feature	Attribute	Measure	Site-specific Targets	Comments	Use for CA?
MINE DUMPS (ID) **FINITE MINERAL, FOSSIL OR OTHER GEOLOGICAL (FM)** **FINTE UNDERGROUND MINES AND TUNNELS** **INLAND OUTCROPS (EO)**	Exposure of features of interest	Visual/ fixed-point photography	The veins, mine dumps and underground workings should remain intact and can be practically exposed if required. Sub-surface features are, however, not accessible safely and may be sensitive to disturbance.		**Yes**
	Condition of features of interest	Visual/ fixed-point photography	The veins, mine dumps and underground workings must remain intact.		**Yes**
	Underground collapse	Visual/ fixed-point photography	Underground passages are not collapsed blocking access to the vein and mineral exposures.		**Yes**
	Underground flooding	Visual/ fixed-point photography	Underground passages are not flooded blocking access to the vein and mineral exposures.		**Yes**
	Vegetation	Visual/ fixed-point photography	Vegetation is acceptable over no more than 20% of the *in situ* deposits.	Metalliferous nature of the soils may limit vegetation overgrowth. Botanists should be consulted before any work takes place as some mineralised exposures may host rare lichen communities.	**Yes**
	Tipping or landfill	Visual/ fixed-point photography	No unconsented tipping or landfill should obscure or damage the mine dumps or mine. This is of particular importance with mine dumps and undergraound workings as it may affect the interpretation of the site.		**Yes**

Criteria feature	Attribute	Measure	Site-specific Targets	Comments	Use for CA?
	Tree planting	Visual/ fixed-point photography	No unconsented tree planting should be allowed to obscure or damage the *in situ* deposits.		**Yes**
	Engineering works	Visual/ fixed-point photography	No engineering works, including inappropriate restoration works, should be allowed to obscure or damage the mineralization or obscure/block entrances and/or underground passages.	Public safety works should take the features of interest into consideration.	**Yes**
	Removal or redistribution of material	Visual/ fixed-point photography	The minerals should not be removed from the site or redistributed around the site without consent. Overburden/spoil should not be removed from or re-distributed around the site. Small scale spoil removal for safety reasons may be carried out if records are kept.	This is of particular importance with mine dump material as this provides an accessible source of material in the context of the mine from which it has been sourced.	**Yes**
	Geological specimen collecting	Visual/ fixed-point photography	Some small scale collecting is acceptable from large mine dumps, but is not acceptable from *in situ* exposures. Sampling from *in situ* exposures should be restricted to scientific research projects. Small- scale hammering may be permitted at the eastern outcrops of the Borrowdale Volcanics.		**Yes**
	Natural processes	Visual/ fixed-point photography	Fluvial processes, which cause erosion, are not constrained within or adjacent to the site.		**No**
	Planning condition observation	Visual/ fixed-point photography	Planning conditions and working or restoration agreements or plans should be observed on site.	Public safety works and any restoration works should take the features of interest into consideration especially with reference to the mines and mine dumps. Some underground exposures could be easily damaged by inappropriate management.	**Yes**

Audit Trail
Rationale for limiting standards to specified parts of the site
Rationale for site-specific targets (including any variations from generic guidance)

Rationale for selection of measures of condition (features and attributes for use in condition assessment)
(The selected vegetation attributes are those considered to most economically define favourable condition at this site for the broad habitat type and any dependent designated species).

County: Cumbria Site Name: Coniston Mines and Quarries

District: South Lakeland

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981, as amended.

Local Planning Authority: Lake District Special Planning Board

National Grid Reference: SD 285989 Area: 128.22 (ha) (ac)

SD 296985, SD 39 NW, Ordnance Survey Sheet 1:50,000: 96 1:10,000: SD 29 NE

Date Notified (Under 1981 Act): 1997 Date of Last Revision: Ð

This is a new site.

A Geological Conservation Review site.

Description and Reasons for Notification:

Coniston Mines and Quarries consists of two areas of fell land and crags on the north-east side of the Coppermines Valley which runs between Coniston village and Levers Water is south Cumbria. The rock outcrops, mine spoil and disused mine workings provide evidence of a major volcanic episode which occurred in northern England in the Ordovician Period, and of the subsequent mineralisation which took place.

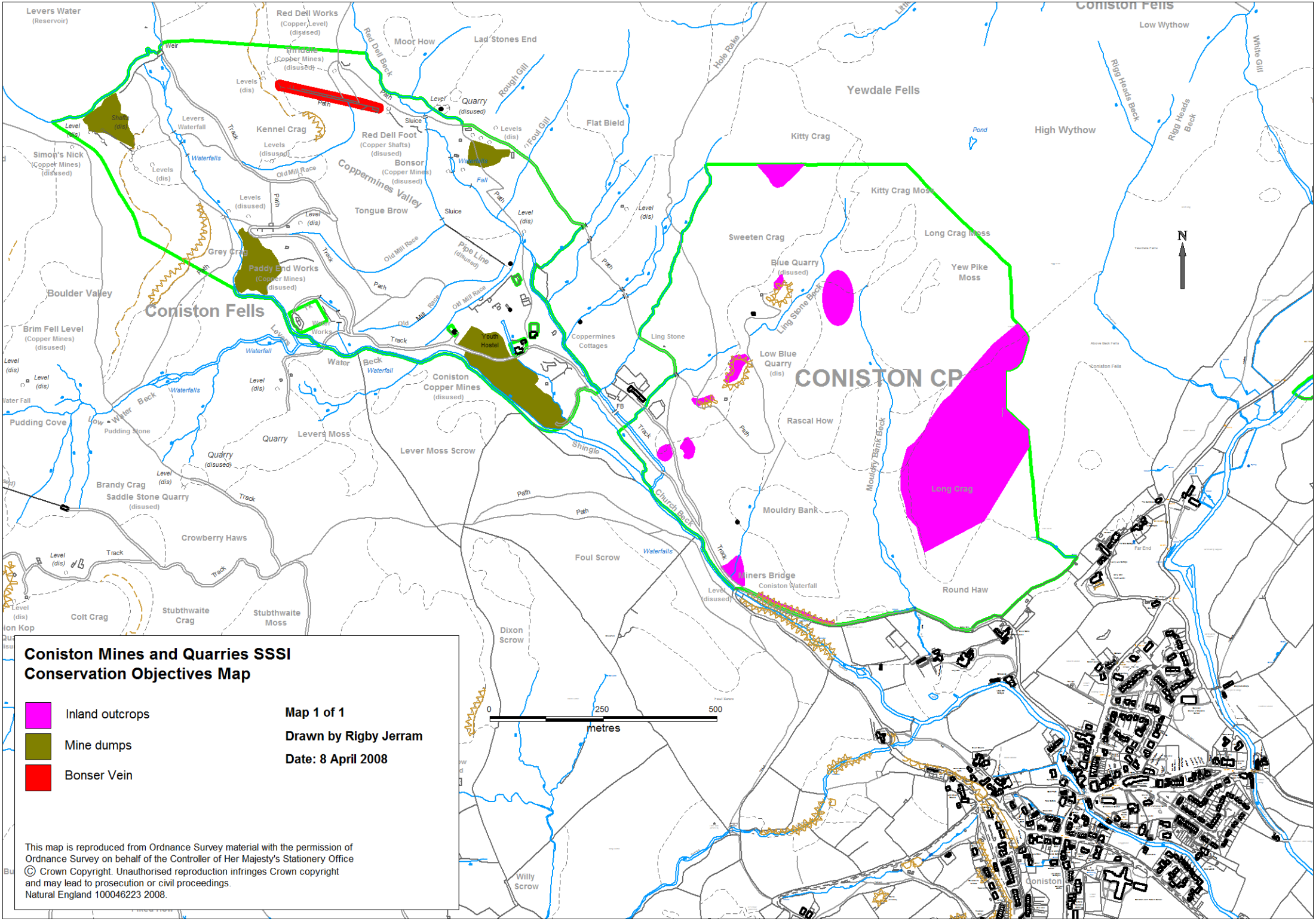
Excellent exposures in the eastern part of the site demonstrate the character of the mid Ordovician Borrowdale Volcanic Group in the southern Lake District. A variety of rock types are exposed, including tuffs, andesitic peperitic sills, ignimbrites and breccias produced by ancient mud-flows. Of particular interest is the thick, composite welded ash-flow tuff forming the cliffs of Long Crag. The volcanic rocks belong to the last phase of volcanism, which formed the Yewdale breccia, Yewdale Bedded Tuff and Wrengill Andesite. These exposures are a key site for interpretation of late Borrowdale volcanic environments.

The Lake District forms a geographically well-defined base-metal orefield. The sulphide mineralisation occurs as vein deposits and is notably diverse in terms of both the nature of the ores and their age.

The western part of the site is located on a cluster of veins running approximately south-east direction from Levers Water for a distance of about 900 metres and over a width of approximately 400 metres. The veins cut obliquely across the strike of a series of tuffs, andesite and rhyolite of the Ordovician Borrowdale Volcanic Group. The two principal veins are the Bonser Vein and the Paddy End Vein.

The typical mineral assemblage is quartz, chlorite, chalcopyrite, arsenopyrite, tennanite and pyrite, with abundant magnetite in the Bonser Vein. Recent studies of material from the Bonser Vein have shown that a diverse range of minerals are present including various bismuth minerals and the first British occurrence of laitakerite. Minor amounts of the cobalt and nickel arsenides Òscutterudite, var. smaltiteÓ and ÒnickelineÓ are reported from the veins.

The site is of national importance for the diversity of primary and secondary ore minerals present in the old mine workings. The mineralisation is the best example of the Late Silurian/early Devonian, Òchalcopyrite-pyrite-arsenopyriteÓ type of mineralisation in the Lake District.



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APPENDIX 6: OPERATIONS LIKELY TO DAMAGE THE SPECIAL INTEREST (OLDS)

Site name: Coniston Mines and Quarries, Cumbria

OLD2000233

Ref. No. Type of Operation

7 Dumping, spreading or discharge of any materials.

12 The introduction of tree and/or woodland management (where applicable) and alterations to tree and/or woodland management (including planting).

13b Modification to the structure of watercourses (eg rivers, streams, springs, ditches, dykes, drains, culverts), including their banks and beds, as by re-alignment, regrading, damming or dredging.

14 Alterations to water levels and tables and water utilisation (including storage).

20 Extraction of minerals, including spoil.

21 Destruction, construction, removal, rerouting, or regrading of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, including soil and soft rock exposures of the laying, maintenance or removal of pipelines and cables, above or below ground.

22 Storage of materials on or against rock faces, outcrops or mine dumps, or in old mine workings.

23 Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling.

24a Modification of natural or man-made features and clearance of boulders, large stones, loose rock or scree.

24b Battering, buttressing, grading or seeding of geological exposures or mine dumps and infilling old mine workings.