

Birmingham & Black Country Local Sites Assessment Report

EcoRecord Reference	Site Name	Grid Reference	Current Status [1]	Survey Date(s)
BM144	Rubery Cutting & Leach Green Quarries	SO 992773 [LGQ] SO 992774 [LGQ] SO 992775 [RC]	LNR	31.08.19 07.03.20 27.02.22
Planning Authority	Site Ownership	Area/Length	Reason for Survey	Report Date
Birmingham CC	Birmingham CC	100m[RC]/300m[LGQ]	Research	09.03.23
Meets LS Criteria		Type	Geological	i.e. Wildlife/Geological
Amendment(s)	Update	i.e. None; New Site; Upgrade; Downgrade; Extension; Whole/Part Deletion		
Description	A major unconformity between Ordovician Lickey Quartzite Formation and Silurian Rubery Formation.			

Citation (Summary of Value)

Designated a LNR for geology in 1991, this was one of Birmingham's first LNRs, and was described at the time as, "one of Birmingham's most important geological sites". Despite regular clearance work by the dedicated volunteers of the Lickey Hills Geo-Champions (with the Support of the Country Park Rangers), a significant part of the Rubery Cutting exposure and all of the Leach Green Quarry are now inaccessible.

Local Site Selection Criteria

Geological

Intrinsic	Palaeontology	M	Brachiopods, corals and trilobites have been reported from the Silurian rocks.
	Stratigraphy	H	<p>Ordovician Lickey Quartzite Formation (LQF) 485 – 444Ma The Lickey Quartzite at this site varies from fine-grained and white, to coarse and grey, in massive beds up to about 1m thick, which were lithified, jointed and eroded before the Llandovery transgression. (Old et al 1991)</p> <p>Rubery Sandstone Member 444 – 433Ma Massive, coarse-grained, decalcified sandstone, varying from pale grey and compact to open-textured, with reddish and purple stains. Some constituent grains are well-rounded and probably aeolian in origin. The basal bed contains clasts of Lickey Quartzite up to 15cm across. The beds were deposited in a sea transgressing a rugged, arid shoreline. (Old et al 1991)</p> <p>Rubery Shale Member 439 – 433 Ma* The Rubery Shale succeeds the Rubery Sandstone. Buff, grey, blue and purple, non-calcareous shales (with 'fucoids' at the base), interbedded with thin beds of fine-grained, decalcified, fossiliferous white and purple limestone. (Old et al 1991)</p>
	Structure	H	In spite of the unconformity, the bedding in the two formations appears almost parallel in the road cutting – gently dipping eastwards. The Leach Green Quarry runs north-south, providing a strike section, along which the unconformity can be followed, rising gradually, southwards. At the A38 junction, the Leach Green exposure meets the Rubery road cutting, which runs east-west, providing a dip section. From the unconformity, the succession can be followed through the Rubery Sandstone and into the Rubery Shale. A strike-slip fault cuts both formations, and an igneous dyke intrudes the LQF.
	Physiography & Geomorphology	L	The c.7m high quarry face and the road cutting are man-made features, and have no real value in terms of geomorphology.
Rarity	H	This location provides a unique exposure of this unconformity and sequence.	
Ass. with Other Sites	H	The Lickey Quartzite Formation is exposed at sites along the length of the Lickey Hills ridge, running from Holly Hill in the north to Kendal End in the south. This location is of great importance in understanding all the others.	
Social			
Historical & Cultural	L	The Rubery Cutting resulted from widening of the A38 in 1921. The Leach Green Quarry is one of many on the Lickey Hills that provided stone for road building. It ceased production in 1935.	
Access	H	The Rubery Cutting is an open access site. However, the outcrop of Rubery Shale and the upper part of the Rubery Sandstone are now totally obscured by vegetation. The Leach Green Quarry was fenced off behind late twentieth century housing, in order to preserve access. However, it is now heavily overgrown and has been allowed to fill with rubbish. Consequently, it has been inaccessible for a number of years.	
Aesthetic	L	The Rubery Cutting used to exhibit a striking sequence of rocks recording profound environmental change. To walk through it was to journey through a chapter of Earth history. It is now largely obscured. The Leach Green Quarry has been allowed to become an informal waste disposal site and needs its aesthetic value to be restored.	
Recorded History	M	The site has been referenced in several scientific papers – see data sources.	
Value for Learning	H	It is by studying sites such as this that we learn to understand the causes and consequences of environmental change.	

Site Description

At its junction with Leach Green Lane, the slip road from the A38 (Bristol Road South) has been accommodated by cutting in to the rocks on its southern side. The resulting rock face exposes a dip section of Lickey Quartzite unconformably overlain by Rubery Sandstone and Rubery Shale. At right angle to this, the exposed face of the Leach Green Quarry reveals a strike section of the same rocks. Channels in the eroded surface of the LQF contain coarse gravels. The LQF is cut by an igneous dyke, which is truncated by the Rubery Sandstone. A path at the base of the quarry face has been fenced off from the rear of the properties along Leach Green Lane, with the intention of preserving access to the largest part of this LNR. Neglect has led to the path becoming impassable.

Geology

Solid/Drift Formation	Lickey Quartzite Formation & Rubery Formation.
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Description	The Lickey Quartzite at this site is a mature quartz arenite. It exhibits cross-bedding in places, probably resulting from tidal currents in an off-shore environment. However, much of it is heavily bioturbated, and lacks structures apart from bedding. The rock is very competent, and is heavily jointed. The constituent grains exhibit tightly sutured boundaries, resulting from deep burial. As a consequence, fractures in this rock cut through grains, producing smooth surfaces. The upper surface of the LQF is a highly irregular erosion surface. The overlying Rubery Sandstone can be distinguished by its red colour, and the fact that fractures pass between grains, producing rough surfaces. This rock has not been so deeply buried, and grains do not have sutured boundaries. At the base of the Rubery Formation larger clasts are concentrated in hollows in the upper surface of the LQF. These comprise locally-derived angular fragments of Lickey Quartzite, and well-rounded pebbles with a longer transport history. The sand fraction includes well-rounded, frosted aeolian grains. A near-vertical, 20cm wide channel in the Rubery Cutting has been eroded along a strike-slip fault that contains brecciated fragments of Lickey Quartzite and Rubery Sandstone in a sandy matrix. The fault cuts through both formations. In the Leach Green Quarry, a deeply-weathered dyke is seen to cut through the LQF, but terminates against the Rubery Sandstone, which it pre-dates.
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Features of Value

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| 1 | A spectacular unconformity marking the transition from land to sea as a consequence of rising sea level, with the overlying upward-fining sedimentary sequence recording the continuing deepening of the marine environment. |
| 2 | The lithology and structure of the LQF, providing important evidence of the overall structure of the formation. |

Soils

Public Access & Site Usage

Land Use	Rubery Cutting - Public Open Space. Leach Green Quarry is used for illegal waste disposal.
Access Level	Rubery Cutting – Unrestricted. Leach Green Quarry – Restricted.
Access Type(s)	LNR

Comparison with Previous Survey(s) Results

Since the sites were originally designated, over 90% of the exposure has become inaccessible.

Summary of Assessment

Despite the efforts of the Lickey Hills Geo-Champions, "one of Birmingham's most important geological sites" is in need of remediation, and continued maintenance.

Recommendations (including further survey & site management/enhancement)

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| 1 | Vegetation to be removed from the entire length of the Rubery Cutting exposure. |
| 2 | Removal of rubbish and clearance of vegetation within the fenced access area of the Leach Green Quarry. |
| 3 | Provide funding for an interpretation panel, so that local people can appreciate the importance of preserving the site, and encourage respect for the environmental significance of our geological heritage. |

Data Sources		
	Source	Date
Species and Habitat Data Source(s)		
Geological Data Source(s)	<ul style="list-style-type: none"> BGS, Geology of Britain Viewer; https://mapapps.bgs.ac.uk/geologyofbritain/home.html BGS, Lexicon of Named Rock Units; https://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=LQ Boulton, W.S. (1927) The Geology of the Northern part of the Lickey Hills, near Birmingham. <i>Geological Magazine</i>, Vol 65, Issue 6, 255-266 Butler, A.J. (1937). On Silurian and Cambrian rocks encountered in a deep boring at Walsall, South Staffordshire, <i>Geological Magazine</i>, Vol 74, 241-257. Eastwood, T., Whitehead, T.H., and Robertson, T. (1925). The geology of the country around Birmingham. <i>Memoir of the British Geological Survey of Great Britain</i>. NERC Hardie, W.G. (1971) Lickey Hills; <i>G.A. Guide No.1 The Area around Birmingham</i> (2nd Ed.). The Geologists' Association. pp. 12-15 Hardie, W.G. (1991) A Guide to the Rocks and Scenery of the Lickey Hills Area. The Lickey Hills Society, Old, R.A., Hamblin, R.J.O., Ambrose, K., and Warrington G. (1991). Geology of the country around Redditch. <i>Memoir of the British Geological Survey, Sheet 183</i>. NERC. Lapworth, C., (1899). Sketch of the geology of the Birmingham district, with special reference to the long excursion of 1898. <i>Proceedings of the Geologists' Association</i>, Vol 15, 313-415. Richardson, A.S. (2019). <i>The Lower Palaeozoic Geology of the Lickey Hills 2nd Ed.</i> https://ehtchampions.org.uk/ch/wp-content/uploads/pdfs/Lower%20Pal%20of%20Lickey%202nd%20Ed.pdf Sherstone, E., Field Map. 1984 Wills, L.J. et al (1925). <i>The Upper Llandovery Series of Rubery. Proc. Birmingham Nat. Hist. & Phil. Soc.</i> Vol. 15, 67-83 Wills, L.J. & Laurie, W.H. (1938). Deep Sewer Trench along the Bristol Road from Ashill Road near the Longbridge Hotel to the City Boundary at Rubery, 1937. <i>Proc. Birmingham Nat. Hist. & Phil. Soc.</i> Vol. 16, 175-180 	
Historic Data Sources(s)		
Assessment Author and Organisation	Alan Richardson - Herefordshire & Worcestershire Earth Heritage Trust & Black Country Geological Society	

[1] Definitions of Local Sites in B&BC (SINC& SLINC&S) and Potential Sites of Importance (PSIs)

In Birmingham and the Black Country Local Wildlife and Geological Sites encompass what are termed Sites of Importance for Nature Conservation (SINC&S) and Sites of Local Importance for Nature Conservation (SLINC&S). This two-tier system aims to ensure that all sites of substantive local nature conservation and geological value are selected by assessing sites in both a sub-regional (i.e. Birmingham and the Black Country) and metropolitan borough or city context (either Birmingham, Dudley, Sandwell, Walsall or Wolverhampton). The two designations are defined as:

- Site of Importance for Nature Conservation (SINC) - Sites of substantive nature conservation value in the context of Birmingham and the Black Country.
- Site of Local Importance for Nature Conservation (SLINC) - Sites of substantive nature conservation value in the context of a metropolitan borough.

Potential Sites of Importance (PSIs) have not yet been assessed against the Local Wildlife and Geological Sites selection criteria but may potentially support species of note, areas of important semi-natural habitat or valuable geological features. PSIs are identified primarily through the use of aerial photography, but also through reference to old maps, existing records and local knowledge. Commonly these sites will not have been subject to the survey work necessary to undertake a Local Wildlife and Geological Sites assessment.

[2] Habitats/Species of Note Tables – Attribute Definitions

STATUTORY (PROTECTED) - **EHD** = EU Habitats Directive (plus where relevant the Annex II or IV) | **WCA S1** = Wildlife & Countryside Act Schedule 1 (birds protected at all times) | **WCA S5** = Wildlife & Countryside Act Schedule 5 (animals with various levels of protection) | **WCA S8** = Wildlife & Countryside Act Schedule 8 (higher and lower plants with various levels of protection) | **PBA** = Protection of Badgers Act 1992 | **HabRegs2** = The Conservation (Natural Habitats, &c.) Regulations 2010 (Schedule 2) | **HabRegs4** = The Conservation (Natural Habitats, &c.) Regulations 2010 (Schedule 4).

NERC – **Y** = Habitats/Species included on the current list of Principal Importance in England under Section 41 of the NERC Act (2006 or amended).

LBAP – **Y** = Habitats/Species included on the latest B&BC LBAP list of Priority Habitats/Species.

RDL - Species included on Global IUCN & British Red Data Lists: **BRed** = Bird Population Status – red | **BAmb** = Bird Population Status - amber | **RLGB.EN** = IUCN (2001) – Endangered | **RLGB.VU** = IUCN (2001) – Vulnerable | **RDBG.B.R** = IUCN (pre 1994) – Rare | **RLGB.Lr(NT)** = IUCN (2001) - Lower risk - near threatened | **RDBG.IK** = RDB - Insufficient known | **RLGB.DD** = IUCN (2001) - Data Deficient

RARITY (HABITATS) - BIRMINGHAM & BLACK COUNTRY - **Y** = Habitats included on the B&BC list of locally rare habitats (administered by EcoRecord).

RARITY (FLORA SPECIES) - BIRMINGHAM & BLACK COUNTRY - (based on data held and managed by EcoRecord): **VR** = Very Rare - a species present in less than 1.0% of 1Km squares, tetrads, or 5Km squares in B&BC | **R** = Rare - a species present in 1.0% - 4.3% of 1Km squares, tetrads, or 5Km squares in B&BC | **U** = Uncommon - a species present in 4.3% - 12% of 1Km squares, tetrads or 5Km squares in B&BC | **NRR** = no recent B&BC records.

AXIOPHYTE - BBCF_Ax = included on the Birmingham & the Black Country list of axiophytes (administered by EcoRecord).

YEAR - The most recent year the species has been recorded.

[3] Species listed on Schedule 9 part 1 (animals) and part 2 (plants) of the Wildlife and Countryside Act 1981 as amended - this lists animals which may not be released or allowed to escape into the wild and plants which may not be planted or otherwise caused to grow in the wild.



Fig.1. Map of Rubery showing the Rubery Cutting and Leach Green Quarry in red.



Fig. 2 Aerial photograph of the Rubery Cutting – Leach Green Quarry LNR.

Target Notes

Target Note Ref.	Target Note Description
TN001	

Site Photographs



Fig 3. The Rubery Cutting, as it appeared after a clearance session in 2013. The slip road from the A38 lies across the foreground.



Fig 4. The same location in 2021. Despite the continuing efforts of the Lickey Hills Geo-Champions, the rocks (for which the site was designated) are disappearing beneath a veil of vegetation.

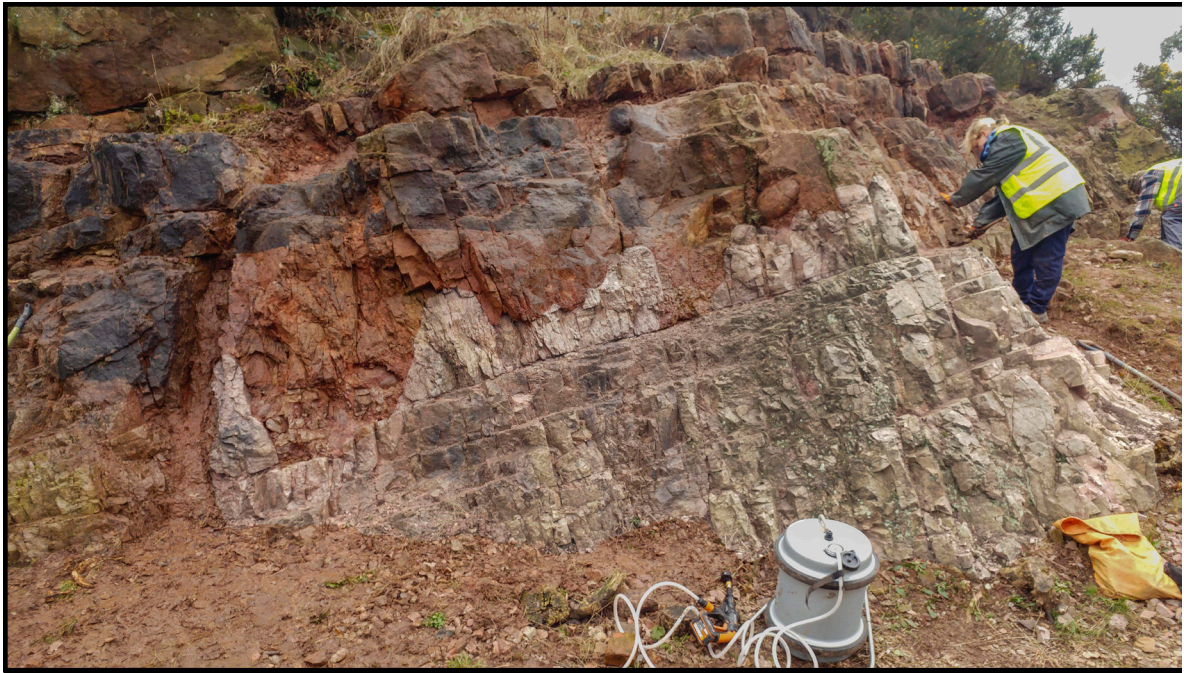


Fig 5. Looking south, at the point where the Rubery Cutting joins the Leach Green Quarry, during conservation work. The picture has been digitally enhanced to clarify the distinction between the (pale) LQF, and the overlying Rubery Sandstone. A notable feature of this unconformity is the irregular nature of the erosion surface that has been preserved.

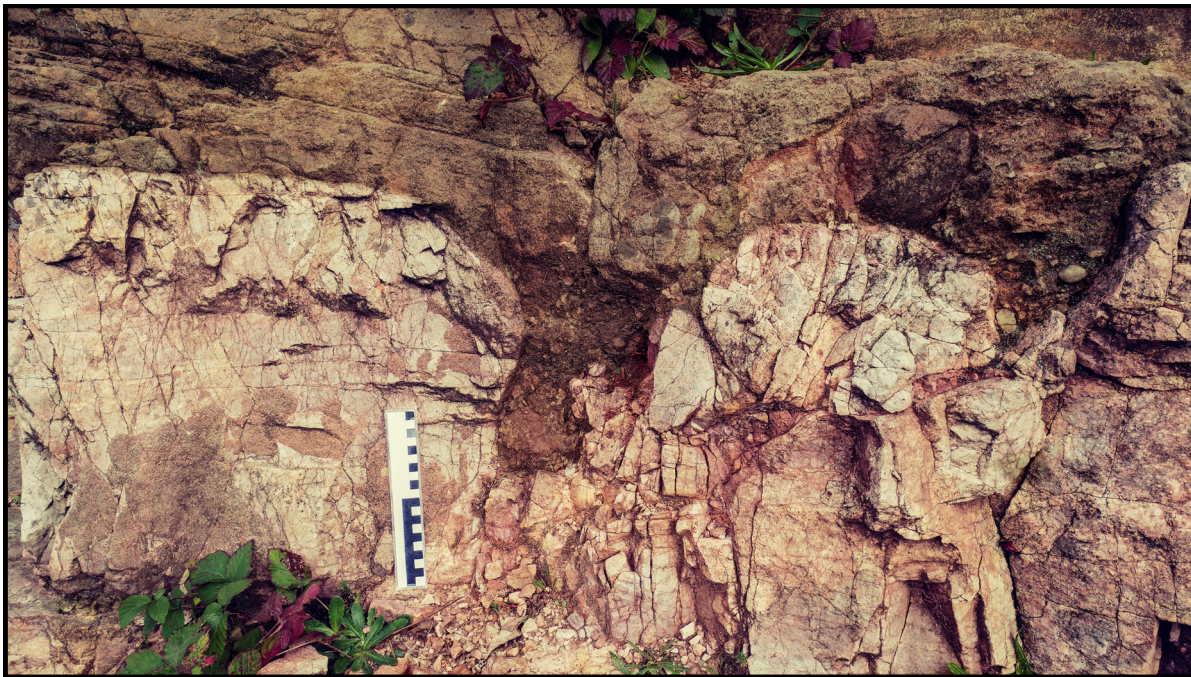


Fig 6. Another view of the unconformity, once again demonstrating the irregularity of the erosion surface. Eroded clasts of Lickey Quartzite are abundant at the base of the Rubery Sandstone.



Fig 7. Previously described as a 'neptunian dyke', this feature in the Rubery Cutting contains fragments of Lickey Quartzite and lithified Rubery Sandstone, and continues up into the Rubery Formation. Rough sub-horizontal ridges and grooves in the left hand side wall confirm it to be a strike-slip fault. This feature can also be seen in Fig. 3, and at 'a1' in Fig. 8.

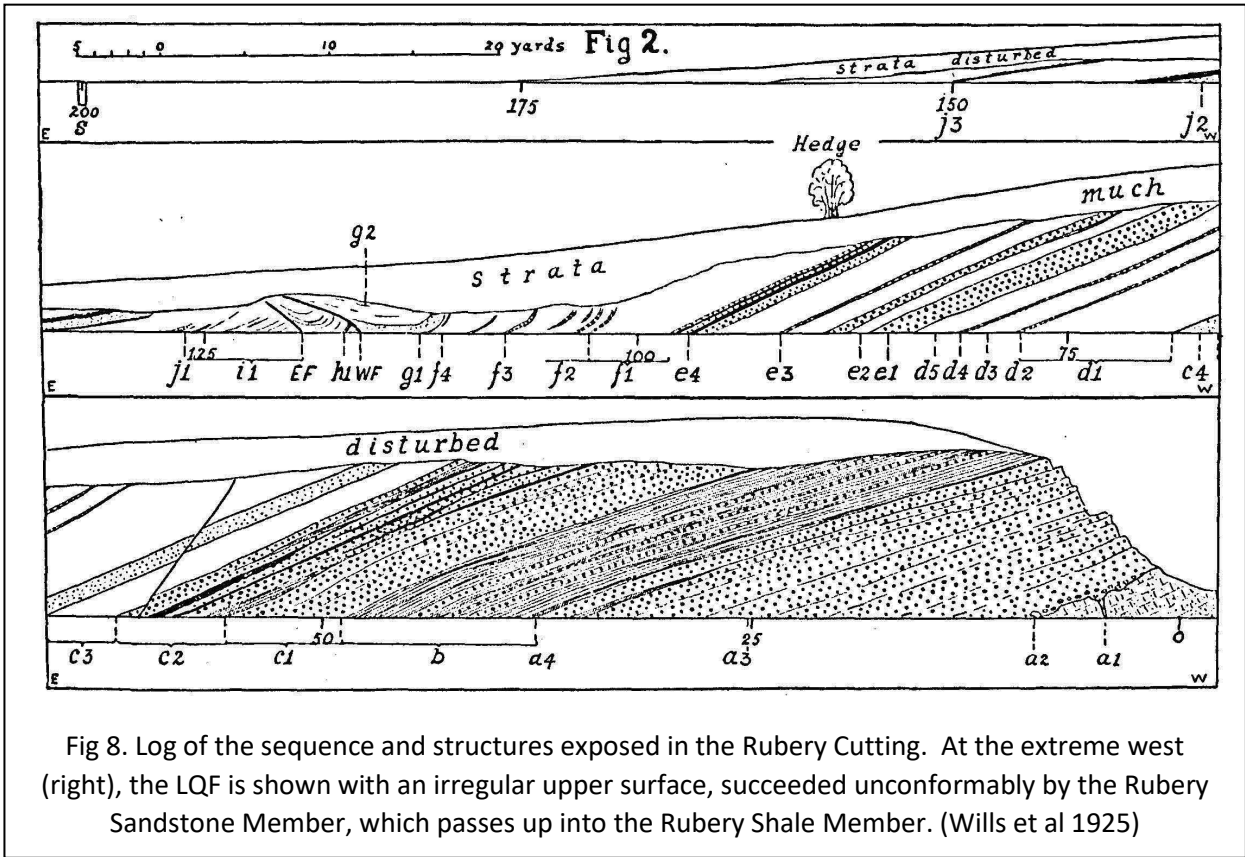


Fig 8. Log of the sequence and structures exposed in the Rubery Cutting. At the extreme west (right), the LQF is shown with an irregular upper surface, succeeded unconformably by the Rubery Sandstone Member, which passes up into the Rubery Shale Member. (Wills et al 1925)



Fig 9. A digitally enhanced image of a channel in the erosion surface containing large angular fragments of Lickey Quartzite, along with well-rounded pebbles. (Moseley Archive)

Bid to protect fossils quarry

A 300-million-year-old rock face sandwiched between derelict flats and a row of houses is to become one of Birmingham's first Local Nature Reserves.

Rubery Cutting, also known as Leach Green Quarry, is considered one of the city's most important geological sites by the Nature Conservancy Council.

Now Mr Derek Brown, the city's conservation officer, has steered proposals to turn the cutting into a reserve through council committees and only awaits final approval from the full council. Five other sites around the city are awaiting the same approval.

The rock face was exposed by quarrying work and consists of Rubery sandstone laid down in the Silurian period when the West Midlands lay underneath warm shallow seas.

It contains numerous fos-



Rubery Cutting: one of the city's most important geological sites.

sils of prehistoric animals including corals, trilobites and brachiopods.

Designation as a local nature reserve means it is protected from developers or any other kind of destructive disturbance.

Birmingham already has a number of nature reserves in areas such as Sutton Park which have been declared Sites of Special Scientific Interest by the Nature Conser-

vancy Council.

The "local" designation is aimed at protecting sites which are not so important as SSSIs but which have regional or local significance.

Mr Brown said: "I hope the cutting will become an important resource for schools. The creation of these reserves is an important step in the conservation strategy which the city has devised over the past few years."

One of the other sites is Moseley Bog, a 23-acre wetland three miles from the city centre.

It was threatened by a building development in 1980 but local residents mounted a successful campaign to save it.

The bog, along with the nearby Dell, is used extensively by schools for nature study.

Fig 11. Leach Green Quarry, as it appeared in 1989: "one of the city's most important geological sites".