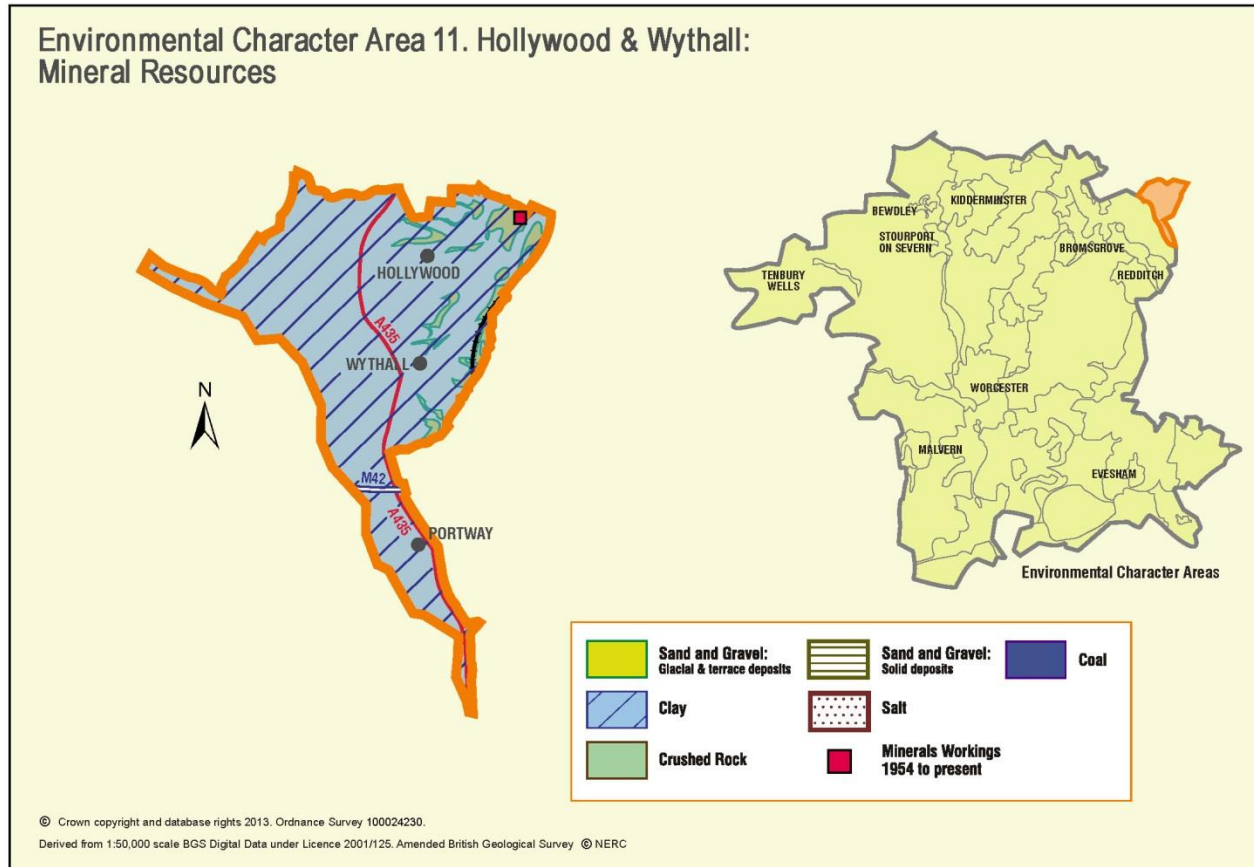


Appendix 11: Analysis of aggregate resources in ECA 11: Hollywood and Wythall



ECA Summary for the Fourth Stage consultation on MLP (Winter 2018):

Sand and gravel

There are 12 resource areas identified for sand and gravel in Hollywood and Wythall ECA:

- Key: 2
- Significant: 3
- Not significant: 1
- Compromised: 6

Crushed rock

There are no resource areas identified in Hollywood and Wythall ECA for crushed rock.

Non-aggregates

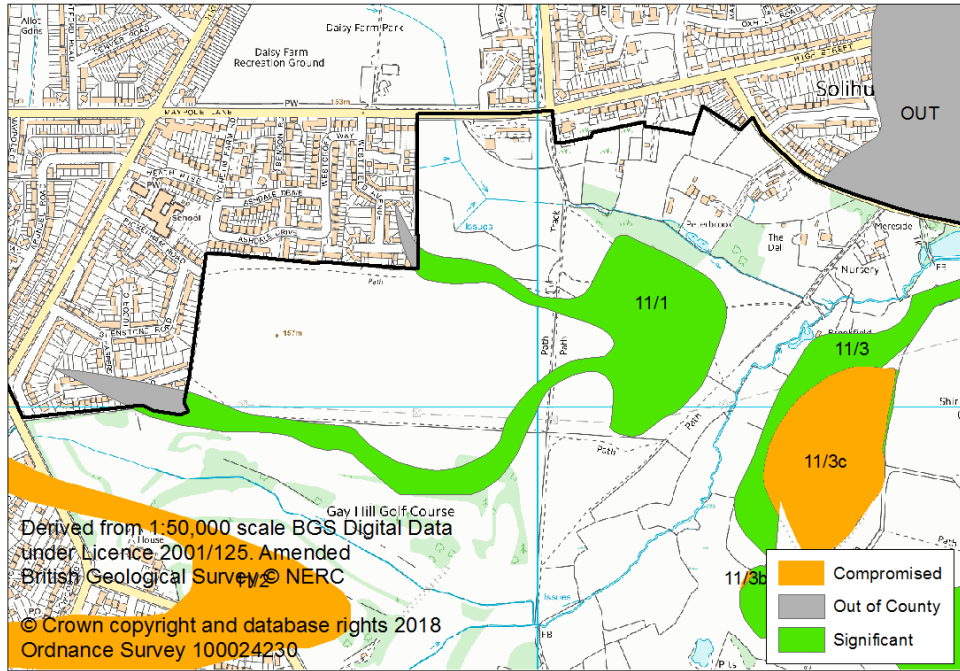
BGS data indicates that there are deposits of clay in this ECA.

Overview of resource assessment for ECA 11

Sand and gravel resource areas:

Resource number*	Second Stage Consultation		Third Stage Consultation		Fourth Stage Consultation		
	Original estimated resource tonnage (2 tonnes/m ³)	Significance	Revised estimate of resource tonnage (1.65 tonnes/m ³)	Significance	New resource number (where resource has been split)	Revised estimate of resource tonnage (1.65 tonnes/m ³)	Result
11/1	1,023,000	Significant	843,975	Significant		843,975	Significant
11/2	1,395,000	Compromised	1,150,875	Compromised	Not reassessed		
11/3	1,440,000	Significant	1,188,000	Significant	11/3	816,750	Significant
					11/3b		Compromised
					11/3c		Compromised
11/4	1,581,000	Compromised	1,304,325	Compromised	Not reassessed		
11/5	940,000	Significant	775,500	Significant	11/5	775,500	Significant
					11/5b		Compromised
11/6	2,538,000	Key	2,093,850	Key	11/6	1,861,200	Key
					11/6b		Compromised
11/7	364,000	Not significant	300,300	Not significant	Not reassessed		
11/8	1,128,000	Compromised	930,600	Compromised			
11/9	7,425,000	Key	6,125,625	Key		6,125,625	Key

Overview	
Resource number:	11/1
Resource name:	Peterbrook
Resource area:	11ha
Resource depth:	Estimated 9.3m
Location	
OS sheet reference:	SP 07 NE
National grid ref:	409018, 278081



Resource description:

Resource description: Glaciofluvial sand and gravel. The BGS memoir notes that there are rapid lateral variations in lithology in this area likely to persist throughout the outcrop and beneath the overlying boulder clay making an assessment of the resource by boreholes difficult. The deposit varies in composition from coarse gravel to bedded sand with small areas of clay. The deposit may continue to the west where it is overlain by boulder clay.

The workings at Shirley Quarry (to the east) showed 9m of sand and gravel and the glaciofluvial deposits are known to be deeper to the south at Blount's Hole Farm, Trueman's Heath, where a borehole showed an unbottomed sequence of sand and gravel 11.2m thick.

At the Wythall Sand and Gravel Company pit at Trueman's Heath (south east of this resource area) the memoir records "the working face shows up to 10m of cross-bedded, brown sand with partings of red, brown-clay and micaceous silt and rare pebbly bands up to 5cm thick". Four boreholes to the west of Little Trueman's Heath Farm recorded 11.2m, 9.8m, 2.6m and 7.6m of sand and gravel.

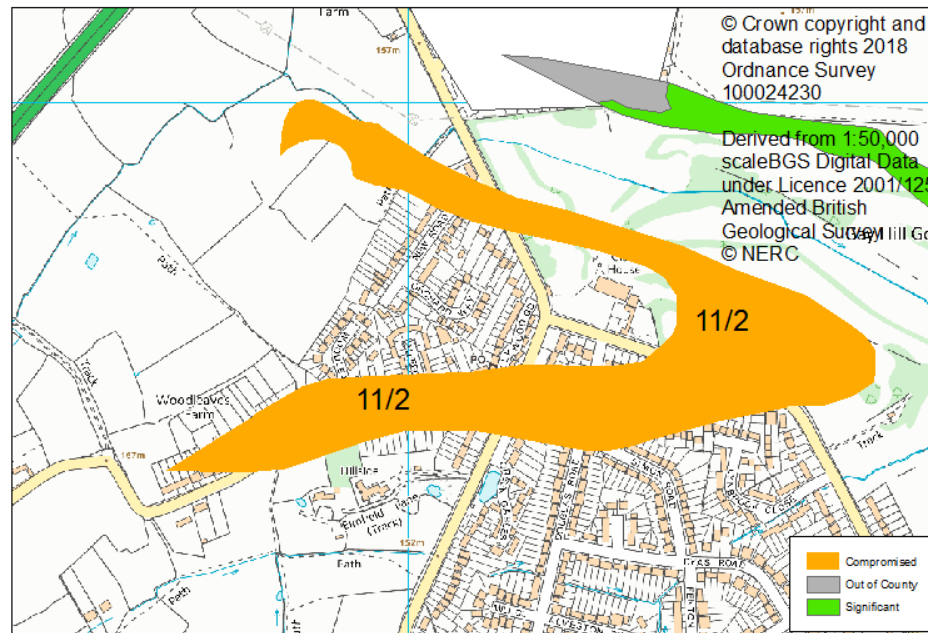
Estimated resource depth based on mean average of: a) depth at Shirley Quarry: 9m, b) Blount's Hole Farm: 11.2m, c) Wythall Sand and Gravel Company pit: 10m, d) mid-point of boreholes west of Little Trueman's Heath Farm (2.6m, 7.6m, 9.8m and 11.2m): 6.9m = 9.3m

Assessment of resource for the second consultation on MLP (Autumn 2013)

Commentary: A small resource area with little development. The deposit extends outside the county boundary into the settlement of Highter's Heath, this is not included as part of the resource area and is shown as OUT on the

	figure.
Crude estimate of resource:	Area: 11ha x average depth: 9.3 m ÷ 2 Estimated resource volume: 511,500 m ³ Estimated resource tonnage (at 2 t/m³): 1,023,000 tonnes.
Conclusion:	Significant. Consider in defining areas of search.
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)	
Revised estimate of resource:	Area: 11ha x average depth: 9.3 m ÷ 2 Estimated resource volume: 511,500 m ³ Estimated resource tonnage (at 1.65 t/m³): 843,975 tonnes
Conclusion:	Significant.
Assessment of resource for the Fourth Stage consultation on MLP (August 2018)	
Resource area:	11 ha
Resource depth:	Estimated 9.3m
Revised estimate of resource:	Area: 11ha x average depth: 9.3 m ÷ 2 Estimated resource volume: 511,500 m ³ Estimated resource tonnage (at 1.65 t/m³): 843,975 tonnes
Conclusion:	Significant resource

Overview	
Resource number:	11/2
Resource name:	North of Hollywood
Resource area:	15ha
Resource depth:	Estimated 9.3m
Location	
OS sheet reference:	SP 07 NE
National grid ref:	408215, 277660



Resource description:

Resource description: Glaciofluvial sand and gravel. The BGS memoir notes that there are rapid lateral variations in lithology in this area likely to persist throughout the outcrop and beneath the overlying boulder clay making an assessment of the resource by boreholes difficult. The deposit varies in composition from coarse gravel to bedded sand with small areas of clay.

The workings at Shirley Quarry (to the east) showed 9m of sand and gravel and the glaciofluvial deposits are known to be deeper to the south at Blount's Hole Farm, Trueman's Heath, where a borehole showed an unbottomed sequence of sand and gravel 11.2m thick.

At the Wythall Sand and Gravel Company pit at Trueman's Heath (south east of this resource area) the memoir records "the working face shows up to 10m of cross-bedded, brown sand with partings of red, brown-clay and micaceous silt and rare pebbly bands up to 5cm thick". Four boreholes to the west of Little Trueman's Heath Farm recorded 11.2m, 9.8m, 2.6m and 7.6m of sand and gravel.

Estimated resource depth based on mean average of: a) depth at Shirley Quarry: 9m, b) Blount's Hole Farm: 11.2m, c) Wythall Sand and Gravel Company pit: 10m, d) mid-point of boreholes west of Little Trueman's Heath Farm (2.6m, 7.6m, 9.8m and 11.2m): 6.9m = 9.3m

Assessment of resource for the second consultation on MLP (Autumn 2013)	
Commentary:	A small resource area significantly compromised by the urban area of Hollywood.
Crude estimate of	Area: 15 ha x average depth: 9.3 m ÷ 2

resource:	Estimated resource volume: 697,500 m ³ Estimated resource tonnage (at 2 t/m³): 1,395,000 tonnes
Conclusion:	Compromised by development with less than 10ha of the deposit remaining.
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)	
Revised estimate of resource:	Area: 15 ha x average depth: 9.3 m ÷ 2 Estimated resource volume: 697,500 m ³ Estimated resource tonnage (at 1.65 t/m³): 1,150,875 tonnes
Conclusion:	Compromised by development.
Assessment of resource for the Fourth Stage consultation on MLP (August 2018)	
Not reassessed due to resource not being classified as Key or Significant in the Third Stage Consultation	

Overview	
Resource number:	11/3
Resource name:	Berry Mound
Resource area:	16ha
Resource depth:	Estimated 9m
Location	
OS sheet reference:	SP 07 NE
National grid ref:	409633, 277801
Resource description:	
Resource description:	<p>Glaciofluvial sand and gravel. The memoir states that sand and gravel is exposed for a distance of "350m along the west face of the disused Shirley Quarry, up to 6m [depth] being exposed at present, although the working is more than 9m deep in places. The deposit varies rapidly, laterally from coarse gravel to bedded sand and rarely, laminated clay". Shirley Quarry is the section excluded from this resource area. The glaciofluvial deposits are known to be deeper to the south at Blount's Hole Farm, Trueman's Heath, where a borehole showed an unbottomed sequence of sand and gravel 11.2m thick.</p> <p>At the Wythall Sand and Gravel Company pit at Trueman's Heath the memoir records "the working face shows up to 10m of cross-bedded, brown sand with partings of red, brown-clay and micaceous silt and rare pebbly bands up to 5cm thick". Four boreholes to the west of Little Trueman's Heath Farm recorded 11.2m, 9.8m, 2.6m and 7.6m of sand and gravel.</p> <p>Estimated resource depth based on depth at Shirley Quarry: 9m</p>
Assessment of resource for the second consultation on MLP (Autumn 2013)	
Commentary:	A small resource area split in two by previous workings The deposit has previously been worked at Shirley Quarry, this is not included as part of the resource area.
Crude estimate of resource:	<p>Area: 16 ha x average depth: 9 m ÷ 2</p> <p>Estimated resource volume: 720,000 m³</p> <p>Estimated resource tonnage (at 2 t/m³): 1,440,000 tonnes</p>

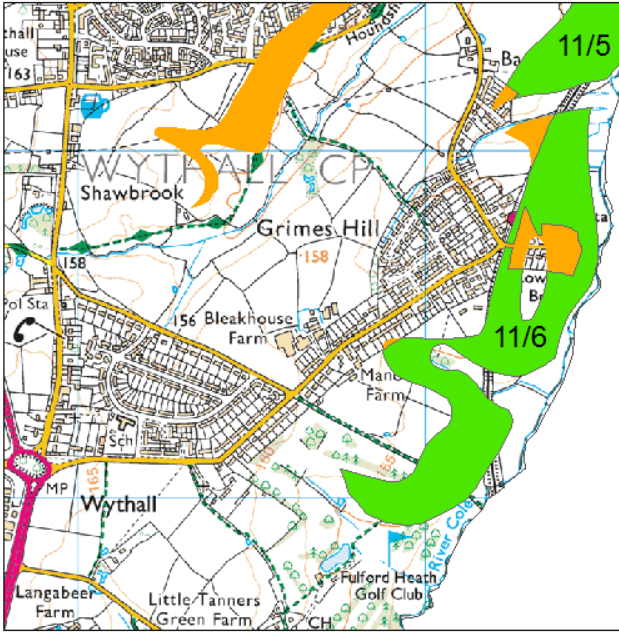
Conclusion:	Significant. Consider in defining areas of search.		
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)			
Revised estimate of resource:	Area: 16 ha x average depth: 9 m ÷ 2 Estimated resource volume: 720,000 m ³ Estimated resource tonnage (at 1.65 t/m³): 1,188,000 tonnes		
Conclusion:	Significant.		
Assessment of resource for the Fourth Stage consultation on MLP (August 2018)			
This resource area has been split into areas 11/3 and 11/3b.			
Resource area 11/3		Resource area 11/3b	
Resource area:	16 ha	Commentary:	Screened out due to the following appendix A criterion: - Site of Special Scientific Interest
Resource depth:	Estimated 9m		
Revised estimate of resource:	Area: 16 ha x average depth: 9 m ÷ 2 Estimated resource volume: 720,000 m ³ Estimated resource tonnage (at 1.65 t/m³): 1,188,000 tonnes		
Conclusion:	Significant resource	Conclusion:	Compromised
Assessment of resource for the Fourth Stage consultation on MLP (November 2018)			
This resource area has been split into areas 11/3 and 11/3c.			
Resource area 11/3		Resource area 11/3c	
Resource area:	11 ha	Commentary:	Screened out due to the following appendix A criterion: - Scheduled Ancient Monument
Resource depth:	Estimated 9m		
Revised estimate of resource:	Area: 11 ha x average depth: 9m ÷ 2 Estimated resource volume: 495,000 m ³ Estimated resource tonnage (at 1.65 t/m³): 816,750 tonnes		
Conclusion:	Significant resource	Conclusion:	Compromised

Overview		
Resource number:	11/4	
Resource name:	East of Peterbrook Road	
Resource area:	17ha	
Resource depth:	Estimated 9.3m	
Location		
OS sheet reference:	SP 07 NE, SP 17 NW	
National grid ref:	410212, 277534	
Resource description:		
Resource description:	<p>Glaciofluvial sand and gravel.</p> <p>The workings at Shirley Quarry (to the north west) showed 9m of sand and gravel and the glaciofluvial deposits are known to be deeper to the south at Blount's Hole Farm, Trueman's Heath, where a borehole showed an unbottomed sequence of sand and gravel 11.2m thick.</p> <p>At the Wythall Sand and Gravel Company pit at Trueman's Heath the memoir records "the working face shows up to 10m of cross-bedded, brown sand with partings of red, brown-clay and micaceous silt and rare pebbly bands up to 5cm thick". Four boreholes to the west of Little Trueman's Heath Farm recorded 11.2m, 9.8m, 2.6m and 7.6m of sand and gravel..</p> <p>Estimated resource depth based on mean average of: a) depth at Shirley Quarry: 9m, b) Blount's Hole Farm: 11.2m, c) Wythall Sand and Gravel Company pit: 10m, d) mid-point of boreholes west of Little Trueman's Heath Farm (2.6m, 7.6m, 9.8m and 11.2m): 6.9m = 9.3m</p>	
Assessment of resource for the second consultation on MLP (Autumn 2013)		
Commentary:	A small resource area significantly compromised by built development.	
Crude estimate of resource:	<p>Area: 17 ha x average depth: 9.3 m ÷ 2</p> <p>Estimated resource volume: 790,500 m³</p> <p>Estimated resource tonnage (at 2 t/m³): 1,581,000 tonnes</p>	

Conclusion:	Compromised by development with less than 10ha of the deposit remaining.
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)	
Revised estimate of resource:	Area: 17 ha x average depth: 9.3 m ÷ 2 Estimated resource volume: 790,500 m ³ Estimated resource tonnage (at 1.65 t/m³): 1,304,325 tonnes
Conclusion:	Compromised by development.
Assessment of resource for the Fourth Stage consultation on MLP (August 2018)	
Not reassessed due to resource not being classified as Key or Significant in the Third Stage Consultation	

Overview		<p>© Crown copyright and database rights 2018 Ordnance Survey 100024230 Derived from 1:50,000 scale BGS Digital Data under Licence 2001/125. Amended British Geological Survey © NERC</p> <p>Legend: ■ Compromised ■ Out of County ■ Significant</p>
Resource number:	11/5	
Resource name:	Trueman's Heath	
Resource area:	10ha	
Resource depth:	Estimated 9.4m	
Location		
OS sheet reference:	SP 07 NE	
National grid ref:	409510, 276406	
Resource description:		
Resource description:	Glaciofluvial sand and gravel.	
	<p>The BGS memoirs record that from Tanner's Green (south of Wythall) the sand and gravel thickens rapidly northwards exceeding 10m along the "proto Cole" valley where the base of the deposit has only rarely been proved in scattered boreholes and the glaciofluvial deposits are known to be deeper to the south at Blount's Hole Farm, Trueman's Heath, where a borehole showed an unbottomed sequence of sand and gravel 11.2m thick.</p> <p>At the Wythall Sand and Gravel Company pit at Trueman's Heath (in this deposit) the memoir records "the working face shows up to 10m of cross-bedded, brown sand with partings of red, brown-clay and micaceous silt and rare pebbly bands up to 5cm thick". Four boreholes to the west of Little Trueman's Heath Farm recorded 11.2m, 9.8m, 2.6m and 7.6m of sand and gravel (mean average = 7.8m).</p> <p>Estimated resource depth based on an average of: a) Blount's Hole Farm: 11.2m, b) Wythall Sand and Gravel Company pit: 10m, c) mid-point of boreholes west of Little Trueman's Heath Farm (2.6m, 7.6m, 9.8m and 11.2m): 6.9m = 9.4m</p>	
Assessment of resource for the second consultation on MLP (Autumn 2013)		
Commentary:	A small resource area in two parts either side of a previous working. The resource area is intersected by a railway to the east.	
Crude estimate of	Area: 10 ha x average depth: 9.4 m ÷ 2	

resource:	Estimated resource volume: 470,000 m ³ Estimated resource tonnage (at 2 t/m³): 940,000 tonnes		
Conclusion:	Significant. Consider in defining areas of search.		
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)			
Revised estimate of resource:	Area: 10 ha x average depth: 9.4 m ÷ 2 Estimated resource volume: 470,000 m ³ Estimated resource tonnage (at 1.65 t/m³): 775,500 tonnes		
Conclusion:	Significant.		
Assessment of resource for the Fourth Stage consultation on MLP (August 2018)			
This resource area has been split into areas 11/5 and 11/5b.			
Resource area 11/5		Resource area 11/5b	
Resource area:	10 ha	Commentary:	Screened out due to the following appendix A criterion: - Settlement boundary
Resource depth:	Estimated 9.4m		
Revised estimate of resource:	Area: 10 ha x average depth: 9.4 m ÷ 2 Estimated resource volume: 470,000 m ³ Estimated resource tonnage (at 1.65 t/m³): 775,500 tonnes		
Conclusion:	Significant resource	Conclusion:	Compromised

Overview	
Resource number:	11/6
Resource name:	Wythall Station
Resource area:	27ha
Resource depth:	Estimated 9.4m
Location	
OS sheet reference:	SP 07 NE, SP 07 SE
National grid ref:	409211, 275490
 <p>© Crown copyright and database rights 2018 Ordnance Survey 100024230</p> <p>Derived from 1:50,000 scale BGS Digital Data under Licence 2001/125. Amended British Geological Survey © NERC</p> <p>Legend: ■ Compromised ■ Out of County ■ Significant</p>	
Resource description:	
Resource description:	Glaciofluvial sand and gravel.
<p>From Tanner's Green (south of Wythall) the sand and gravel thickens rapidly northwards exceeding 10m along the "proto Cole" valley where the base of the deposit has only rarely been proved in scattered boreholes and the glaciofluvial deposits are known to be deeper to the south at Blount's Hole Farm, Trueman's Heath, where a borehole showed an unbottomed sequence of sand and gravel 11.2m thick.</p> <p>At the Wythall Sand and Gravel Company pit at Trueman's Heath (to the north) the memoir records "the working face shows up to 10m of cross-bedded, brown sand with partings of red, brown-clay and micaceous silt and rare pebbly bands up to 5cm thick". Four boreholes to the west of Little Trueman's Heath Farm recorded 11.2m, 9.8m, 2.6m and 7.6m of sand and gravel.</p> <p>Estimated resource depth based on an average of: a) Blount's Hole Farm: 11.2m, b) Wythall Sand and Gravel Company pit: 10m, c) mid-point of boreholes west of Little Trueman's Heath Farm (2.6m, 7.6m, 9.8m and 11.2m): 6.9m = 9.4m</p>	
Assessment of resource for the second consultation on MLP (Autumn 2013)	
Commentary:	A small resource area intersected by rail, a road and some ribbon development.
Crude estimate of resource:	Area: 27 ha x average depth: 9.4 m ÷ 2 Estimated resource volume: 1,269,000 m ³ Estimated resource tonnage (at 2 t/m³): 2,538,000

Conclusion:	Significant – key resource. Use to define areas of search.		
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)			
Revised estimate of resource:	Area: 27 ha x average depth: 9.4 m ÷ 2 Estimated resource volume: 1,269,000 m ³ Estimated resource tonnage (at 1.65 t/m³): 2,093,850 tonnes		
Conclusion:	Significant – key resource.		
Assessment of resource for the Fourth Stage consultation on MLP (August 2018)			
This resource area has been split into areas 11/6 and 11/6b.			
Resource area 11/6		Resource area 11/6b	
Resource area:	24 ha	Commentary:	Screened out due to the following appendix A criterion: - Allocated site in Bromsgrove Local Plan - Settlement boundary
Resource depth:	Estimated 9.4m		
Revised estimate of resource:	Area: 24 ha x average depth: 9.4m ÷ 2 Estimated resource volume: 1,128,000 m ³ Estimated resource tonnage (at 1.65 t/m³): 1,861,200 tonnes		
Conclusion:	Significant resource	Conclusion:	Compromised

Overview	
Resource number:	11/7
Resource name:	Inkford
Resource area:	14ha
Resource depth:	Estimated 2.6m
Location	
OS sheet reference:	SP 07 NE
National grid ref:	408278, 274063
Resource description:	
Resource description:	<p>Glaciofluvial sand and gravel. South of Tidbury Green, towards Inkford, the sand and gravel is thinner than other resource areas to the north and much is concealed beneath boulder clay where its extent is imprecisely known. South of Inkford the sand and gravel ends abruptly. A borehole at the Horse and Jockey Inn to the immediate south west of this resource area proved 5.2m of sand and gravel, beneath 5.9m of Earlswood Till complex, but other boreholes, just 25m to the south, proved only thin boulder clay.</p> <p>Estimated resource depth based on an average of: a) borehole at Horse and Jockey Inn: 5.2m, b) boreholes 25m to the south: 0m = 2.6m</p>
Assessment of resource for the second consultation on MLP (Autumn 2013)	
Commentary:	A small resource area with some built development to the North.
Crude estimate of resource:	<p>Area: 14 ha x average depth: 2.6 m ÷ 2 Estimated resource volume: 182,000 m³ Estimated resource tonnage (at 2 t/m³): 364,000</p>
Conclusion:	<p>Not significant: Small deposit with less than 300,000m³. Not for consideration in defining areas of search.</p>
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)	
Revised estimate of resource:	<p>Area: 14 ha x average depth: 2.6 m ÷ 2 Estimated resource volume: 182,000 m³ Estimated resource tonnage (at 1.65 t/m³): 300,300 tonnes</p>
Conclusion:	Not significant.

Assessment of resource for the Fourth Stage consultation on MLP (August 2018)

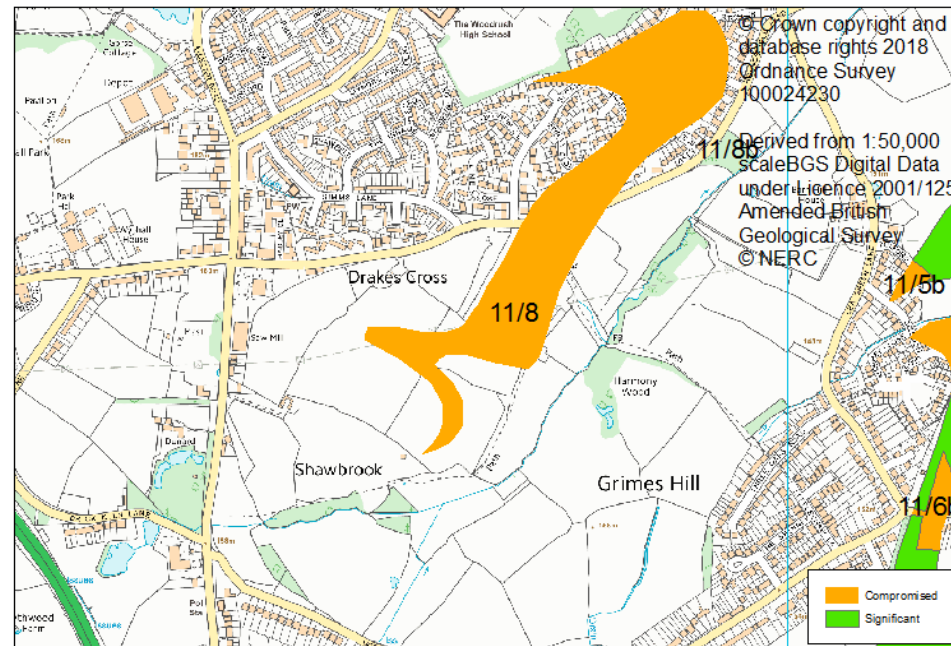
Not reassessed due to resource not being classified as Key or Significant in the Third Stage Consultation

Overview

Resource number: 11/8
Resource name: Drakes Cross
Resource area: 12ha
Resource depth: Estimated 9.4m

Location

OS sheet reference: SP 07 NE
National grid ref: 408608, 276302

**Resource description:**

Resource description: Glaciofluvial sand and gravel. From Tanner's Green (south of Wythall) the sand and gravel thickens rapidly northwards exceeding 10m along the "proto Cole" valley where the base of the deposit has only rarely been proved in scattered boreholes and the glaciofluvial deposits are known to be deeper to the south at Blount's Hole Farm, Trueman's Heath, where a borehole showed an unbottomed sequence of sand and gravel 11.2m thick.

At the Wythall Sand and Gravel Company pit at Trueman's Heath (to the north) the memoir records "the working face shows up to 10m of cross-bedded, brown sand with partings of red, brown-clay and micaceous silt and rare pebbly bands up to 5cm thick". Four boreholes to the west of Little Trueman's Heath Farm recorded 11.2m, 9.8m, 2.6m and 7.6m of sand and gravel.

Estimated resource depth based on an average of: a) Blount's Hole Farm: 11.2m, b) Wythall Sand and Gravel Company pit: 10m, c) mid-point of boreholes west of Little Trueman's Heath Farm (2.6m, 7.6m, 9.8m and 11.2m): 6.9m = 9.4m

Assessment of resource for the second consultation on MLP (Autumn 2013)

Commentary:	A small resource area significantly compromised by the urban area of Drake's Cross.
Crude estimate of resource:	Area: 12 ha x average depth: 9.4 m ÷ 2 Estimated resource volume: 564,000 m ³ Estimated resource tonnage (at 2 t/m³): 1,128,000 tonnes
Conclusion:	Compromised by development with less than 10ha remaining
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)	
Revised estimate of resource:	Area: 12 ha x average depth: 9.4 m ÷ 2 Estimated resource volume: 564,000 m ³ Estimated resource tonnage (at 1.65 t/m³): 930,600 tonnes
Conclusion:	Compromised by development.
Assessment of resource for the Fourth Stage consultation on MLP (August 2018)	
Not reassessed due to resource not being classified as Key or Significant in the Third Stage Consultation	

Overview	
Resource number:	11/9
Resource name:	Frankley Lodge Road
Resource area:	9ha (within Worcestershire)
Resource depth:	Estimated 82.5m
Location	
OS sheet reference:	SO 98 SE
National grid ref:	400794, 279685

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Ordnance Survey 100024280

Key
Out of County

Resource description:	
Resource description:	Kidderminster formation solid sand. The BGS memoir for Birmingham states that in this area, the Kidderminster formation comprises 45-120m of predominantly medium to coarse grained pebbly sandstone with poorly cemented conglomerate towards the base. It varies from friable and weakly cemented to well cemented. (Estimated resource depth calculated as median average of 45m to 120m = 82.5m)
Assessment of resource for the second consultation on MLP (Autumn 2013)	
Commentary:	A small resource area with little built development. This deposit extends beyond the county boundary, this is not considered as part of the resource area and is shown as OUT in the figure above.
Crude estimate of resource:	Area: 9 ha x average depth: 82.5 m ÷ 2 Estimated resource volume: 3,712,500 m ³ Estimated resource tonnage (at 2 t/m³): 7,425,000
Conclusion:	Significant – key resource. Use to define areas of search.
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)	
Revised estimate of resource:	Area: 9 ha x average depth: 82.5 m ÷ 2 Estimated resource volume: 3,712,500 m ³ Estimated resource tonnage (at 1.65 t/m³): 6,125,625 tonnes
Conclusion:	Significant – key resource.
Assessment of resource for the Fourth Stage consultation on MLP (August 2018)	
Resource area:	9 ha

Resource depth:	Estimated 82.5m
Revised estimate of resource:	Area: 9 ha x average depth: 82.5 m ÷ 2 Estimated resource volume: 3,712,500 m ³ Estimated resource tonnage (at 1.65 t/m³): 6,125,625 tonnes
Conclusion:	Key resource