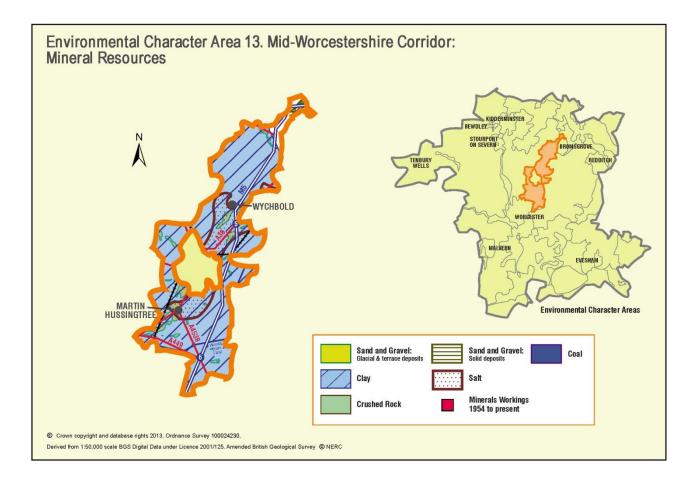
Appendix 13: Analysis of aggregate resources in ECA 13: Mid Worcestershire Corridor



ECA Summary for the Third Stage consultation on MLP (Spring 2015):

Sand and gravel

There are 12 resource areas identified for sand and gravel in Mid-Worcestershire Corridor ECA:

- Key: 1
- Significant: 2
- Not significant: 8
- Compromised: 1

Crushed rock

There are no resource areas identified in Mid-Worcestershire Corridor for crushed rock.

Non-aggregates

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

Overview of resource assessment for ECA 13

Sand and gravel resource areas:

Resource	e Second Stage Consultation		Third Stage Consultation	
number*	Original estimated resource tonnage (2 tonnes/m ³)	Significance	Revised estimate of resource tonnage (1.65 tonnes/m ³)	Significance
13/1	100,000	Not significant	82,500	Not significant
13/2	300,000	Not significant	247,500	Not significant
13/2a	510,000	Compromised	420,750	Compromised
13/3	2,040,000	Key	1,683,000	→ Significant
13/4	1,470,000	Significant	1,212,750	Significant
13/5	0	Not significant	0	Not significant
13/6	0	Not significant	0	Not significant
13/7	0	Not significant	0	Not significant
13/8	3,950,000	Key	2,346,300	Key
13/9	0	Not significant	0	Not significant
13/10	451,000	Not significant	372,075	Not significant
13/11	Not assessed	Not assessed	57,750	Not significant

Overview		
Resource number: Resource name: Resource area: Resource depth: Location OS sheet reference: National grid ref:	13/1 South of Fernhill Heath 10ha Estimated 1m SO 85 NE 386168, 258683	
Resource description:		
Resource description:	5 th terrace (Bushley Green) sand and gravel. Sandy and clayey gravels. The deposits are believed to be thin. Hand augering on the high ground of Fernhill Heath proved a veneer of gravel generally less than 1m thick. (Estimated resource depth 1m)	
Assessment of resource	e for the second consultation on MLP (Autumn 2013)	
Commentary:	A small resource area intersected by a road, with some ribbon development across the centre of the area and a school in the west.	
Crude estimate of resource:	Area: 10 ha x average depth: 1m ÷ 2 Estimated resource volume: 50,000 m ³ Estimated resource tonnage (at 2 t/m ³): 100,000 tonnes	
Conclusion:	Not significant: Small deposit with less than 300,000m ³ . Not for consideration in defining areas of search.	
Assessment of resource	e for the Third Stage consultation on MLP (Spring 2015)	
Revised estimate of resource:	Area: 10 ha x average depth: 1m ÷ 2 Estimated resource volume: 50,000 m ³ Estimated resource tonnage (at 1.65 t/m ³): 82,500 tonnes	

Resource number: 13/2 Resource name: Fernhill Heath East Resource area: 10ha Resource depth: Estimated 3m Location 2/5 OS sheet reference: SO 85 NE	Martin singtr		
Resource area: 10ha Resource depth: Estimated 3m Location	singtr		
Resource depth: Estimated 3m Location	Singer		
Location			
Location			
OS sheet reference: SO 85 NE	1.8		
	1.62		
National grid ref: 387505, 259347	US 41 Miles		
Resource description:			
Resource description: 4 th terrace (Kidderminster Station) sand and gravel. The deposit varies in grade from gravel to sand	d and its		
thickness is believed to range from 1-5m.			
(Estimated resource depth based on median depth of 3m)			
Assessment of resource for the second consultation on MLP (Autumn 2013)			
Commentary: A small resource area intersected by a road. There is little other built development in this resource	area.		
This deposit extends under the village of Fernhill Heath. This section of the deposit is assessed se	This deposit extends under the village of Fernhill Heath. This section of the deposit is assessed separately as		
	resource area 13/2a.		
Crude estimate of Area: 10 ha x average depth: 3m ÷ 2	Area: 10 ha x average depth: 3m ÷ 2		
	Estimated resource volume: 150,000 m ³		
	Estimated resource tonnage (at 2 t/m ³): 300,000 tonnes		
\mathbf{v}	Not significant: Small deposit with less than 300,000m ³ .		
Not for consideration in defining areas of search.			
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)			
Revised estimate of Area: 10 ha x average depth: 3m ÷ 2			
Revised estimate of resource:Area: 10 ha x average depth: 3m ÷ 2Revised estimate of resource:Estimated resource volume: 150,000 m³			

Overview	•		
Resource number:	13/2a		
Resource name:	Fernhill Heath East	38 13/3	
	(a)		
Resource area:	17ha	lown Soly	
Resource depth:	Estimated 3m	- 2/5 Fernhill 43	
Location		8/4 12D 12D	
OS sheet reference:	SO 85 NE	Heath Fifther 13/2 and way	
National grid ref:	387505, 259347		
		The 2/5a	
		THE SALES SALE TO THE SALES SA	
		ange	
		Hindlip Pk ⁰⁹	
		51 121 VP Hindlip Pk	
		Designation of the second scale BGS Digita Gas under	
		Commences and a state of the st	
Resource description:	th		
Resource description:		ster Station) sand and gravel. The deposit varies in grade from gravel to sand and its	
	thickness is believed to	0	
	,	epth based on median depth of 3m)	
		ultation on MLP (Autumn 2013)	
Commentary:	A small resource area almost entirely overlain by the village of Fernhill Heath.		
		the east of the village, this section of the deposit is assessed separately as resource	
Omuda actimate of	area 13/2.	dearth. One is O	
Crude estimate of	Area: 17 ha x average depth: $3m \div 2$		
resource:	Estimated resource volume: 255,000 m ³ Estimated resource tonnage (at 2 t/m ³): 510,000 tonnes		
Conclusion			
Conclusion:		Plopment with less than 10ha of the deposit remaining. onsultation on MLP (Spring 2015)	
Revised estimate of	Area: 17 ha x average		
	Estimated resource vo		
resource:		onnage (at 1.65 t/m³): 420,750 tonnes	
Conclusion:	Compromised by deve		
		iopinent.	

Overview			
Resource number: Resource name: Resource area: Resource depth: Location OS sheet reference: National grid ref:	13/3 Martin Hussingtree 68 ha Estimated 3m SO 85 NE, SO 86 SE 387941, 260115	Porter's Hill 39 39 39 30 30 30 30 30 30 30 30 30 30	
Resource description:		er 245 Der wed rum Bo, dog er eight Spinistal o and under Licence 2001 II America during in Sebological Survey 43 C Frown convrient and with sease right. 2013 (1972) and way find and with the sease right for the sease ri	
Resource		Station) sand and gravel. The deposit varies in grade from gravel to sand and its	
description:	thickness is believed to range from 1-5m.		
	(Estimated resource depth based on median depth of 3m)		
	ce for the second consultat		
Commentary:	A medium-sized resource area with dispersed built development across the south and the east of the area.		
Crude estimate of	Area: 68 ha x average depth: 3m ÷ 2		
resource:	Estimated resource volume: 1,020,000m ³		
	Estimated resource tonnage (at 2 t/m ³): 2,040,000 tonnes		
Conclusion:	Significant – key resource.		
	Use to define areas of search.		
Assessment of resour	ce for the Third Stage cons	ultation on MLP (Spring 2015)	
Revised estimate of	Area: 68 ha x average dept		
resource:	Estimated resource volume	e: 1,020,000m ³	
	Estimated resource tonnage (at 1.65 t/m ³): 1,683,000 tonnes		
Conclusion:	Change to conclusion: Sigr		
	- 0		

Overview			
Resource number:	13/4 35/1 35/1		
Resource name:	Copcut		
Resource area:	49 ha		
Resource depth:	Estimated 3m		
Location			
OS sheet reference:	SO 86 SE		
National grid ref:	388522, 261363		
	Derived fram 1/50,000 scal BGS Digital Data order Hond 2001/125 Amender British Geological Survey HRC Control resource area assessed Europy 10/02/220. Mifes		
Resource description:			
Resource description:	4 th terrace (Kidderminster Station) sand and gravel. The deposit varies in grade from gravel to sand and its		
	thickness is believed to range from 1-5m. A temporary planning permission for working the terrace was		
	granted in 1960 (likely to have been a borrow-pit for road construction) and one of the conditions stated that no		
	working should take place more than 12ft below existing ground level. No information is available to explain if		
	this was detailed information on the thickness of the deposit or an estimate.		
Accompant of recours	(Estimated resource depth based on median depth of 3m)		
	e for the second consultation on MLP (Autumn 2013)		
Commentary: Crude estimate of	A small resource area intersected by roads and some ribbon development across the centre of the area.		
	Area: 49 ha x average depth: 3m ÷ 2 Estimated resource volume: 735,000m ³		
resource:	Estimated resource tonnage (at 2 t/m ³): 1,470,000 tonnes		
Conclusion:	Significant.		
	Consider in defining areas of search.		
Assessment of resource	e for the Third Stage consultation on MLP (Spring 2015)		
Revised estimate of	Area: 49 ha x average depth: 3m ÷ 2		
resource:	Estimated resource volume: 735,000m ³		
	Estimated resource tonnage (at 1.65 t/m ³): 1,212,750 tonnes		
	$r_{1,2,1,2,1,2,1,2,1,2,1,2,1,2,1,2,1,2,1,2$		

Overview		N DOVENT
Resource number: Resource name: Resource area: Resource depth: Location OS sheet reference: National grid ref:	13/5 Westlands 16ha Not known SO 86 SE 387759, 264482	Southall Fm 13/6 10 10 10 10 10 10 10 10 10 10
Resource description:		
Resource description:	4 th terrace (Kiddermins memoirs.	ster Station) sand and gravel. No details of thicknesses are available in the BGS
Assessment of resource	e for the second cons	ultation on MLP (Autumn 2013)
Commentary:	A small resource area	with little built development.
Crude estimate of resource:	Depth not known.	
Conclusion:		deposit with no information to estimate the resource in this area. n defining areas of search.
Assessment of resource		onsultation on MLP (Spring 2015)
Revised estimate of resource:	No change to the ass	
Conclusion:	Not significant.	

Overview	•	
Overview Resource number: Resource name: Resource area: Resource depth: Location OS sheet reference: National grid ref:	13/6 North of Westwood Park 10 ha Not known SO 86 SE 387114, 264833	Southall, Fm Southall, Fm 13/6 13/5 13
Resource description:		(c) NERC. C NERC. C Recorded sand and gravel resource (BGS) Survey 100024230. (c) NERC. (c) NE
Resource description:	4 th terrace (Kidderminst memoirs.	ter Station) sand and gravel. No details of thicknesses are available in the BGS
		Itation on MLP (Autumn 2013)
Commentary:		with little built development.
Crude estimate of resource:	Depth not known	
Conclusion:		eposit with no information to estimate the resource in this area. defining areas of search.
Assessment of resource		onsultation on MLP (Spring 2015)
Revised estimate of resource:	No change to the asse	
Conclusion:	Not significant.	

esource name: Rashwood esource area: 32ha esource depth: Not known ocation S sheet reference: SO 96 NW, SO 96 SW ational grid ref: 391494, 264736
Chateau herpney Derived from 1:50,000 szere BGS Digital Pite trader Uper be 2001125 Aktismed Buitsh Geotopical Survey Up TVERCI Transmit downey and add and gravel resource (BGS)
esource description:
esource description: 5 th terrace (Bushley Green) sand and gravel. No details of thicknesses are available in the BGS memoirs.
ssessment of resource for the second consultation on MLP (Autumn 2013)
ommentary: A small deposit with dispersed development across the resource area.
rude estimate of Depth not known.
esource:
onclusion: Not significant: Small deposit with no information to estimate the resource in this area.
Not for consideration in defining areas of search.
ssessment of resource for the Third Stage consultation on MLP (Spring 2015)
evised estimate of No change to the assessment.
esource:
onclusion: Not significant.

Overview			
Resource number:	13/8 68 Warr Warr Warr		
Resource name:	Wychbold 43 Grange Em		
Resource area:	79ha		
Resource depth:	Estimated 5m		
Revised depth:	Estimated 3.6m		
-	Bducation Stoke		
Location	Henbrook Prior		
OS sheet reference:	SO 96 NW		
National grid ref:	391922, 266448 Wks Wks		
	Sagebury of		
	utch Grutch		
	77 p Brige P 13/8 % = 5		
	10 srived from 7:50,000 scale BGS Dirital Data under 100 000		
	Uperfor 2001/125 Amended Brittin Geological Sonley, STA WHa		
	(c) Crown copyright and d tabas a rights 2013 Oran cash (c)		
	Stilling, 700023230 Miles		
Resource description:			
Resource description:			
	worked to a depth of approximately 5m.		
	(Estimated resource depth 5m)		
	ce for the second consultation on MLP (Autumn 2013)		
Commentary:	A medium resource area with dispersed development. The area overlain by the M5 is not considered as part of		
	this resource area.		
Crude estimate of	Area: 79 ha x average depth: 5m ÷ 2		
resource:	Estimated resource volume: 1,975,000 m ³		
	Estimated resource tonnage (at 2 t/m ³): 3,950,000 tonnes		
Conclusion:	Significant – key resource.		
	Use to define areas of search.		
	ce for the Third Stage consultation on MLP (Spring 2015)		
Revised resource	A site in the north eastern extremity of this resource area has been proposed by the landowners S Hudson and		
description	T Dunkley. The majority of the submitted site is within this resource area, the remainder has been assessed as		
	resource area 13/11.		
	The landowners provided a geological report "Land at Upton Warren Preliminary Mineral Resource Evaluation		
	(dated October 1998) which showed the results of site investigation carried out in August 1998 comprising a		

	total of 14 excavated trial pits. Sand and gravel was intersected in all the trial pits with the mineral deposit comprising a dense silty and slightly clayey sand and gravel. Proven deposit thicknesses ranged between 0.75m in trial pit 02 and greater than 3.8m in trial pit 04 (both in this resource area). The report concludes that across the whole (5.3ha) area, the recoverable mineral tonnage was estimated at 142,000 tonnes.
	The former pit at Upton Warren to the east of this resource area was worked to a depth of approximately 5m.
	(Estimated resource depth based on mean average of: a) former pit at Upton Warren: 5m, b) trial pit range (0.75m and 3.8m): 2.28m = 3.6m)
Revised estimate of	Area: 79 ha x average depth: 3.6m ÷ 2
resource:	Estimated resource volume: 1,422,000m ³
	Estimated resource tonnage (at 1.65 t/m ³): 2,346,300 tonnes
Conclusion:	Significant – key resource.

Overview		
Resource number: Resource name: Resource area: Resource depth: Location OS sheet reference: National grid ref:	13/9 Park Gate 19ha Not known SO 97 SW 393739, 270926	Prived for v60,000 scale BGS Digital Data under Licence part, 122 Amended British Geological Survey (a) NERC Derived for v60,000 scale BGS Digital Data under Licence part, 125 Amended British Geological Survey (b) NERC District 100 2000 register and database erights 2013 Ordanos
Resource description:		
Resource description:	Glaciofluvial sand an	d gravel. No details of thicknesses are available in the BGS memoirs.
Assessment of resource	e for the second cons	sultation on MLP (Autumn 2013)
Commentary:	A small resource are	a intersected by roads and small scale ribbon development.
Crude estimate of resource:	Depth not known.	
Conclusion:	Not significant: Small deposit with no information to estimate the resource in this area. Not for consideration in defining areas of search.	
Assessment of resource		consultation on MLP (Spring 2015)
Revised estimate of resource:	No change to the ass	
Conclusion:	Not significant.	

Resource number: 13/10 Valley 510			
Resource name: Barnsley Hall Resource area: 11ha Resource depth: Estimated 4.1m Location SO 97 SE OS sheet reference: SO 97 SE National grid ref: 395935, 272757	12/51 12/51 12/54 12/64 12/64 12/64 12/6 12/64 12/6 12/6		
Resource description:	Mies 1		
Resource description: 3 rd terrace (Holt Heath) and alluvial fan deposit sand and gravel. A borehole to			
Assessment of resource for the second consultation on MLP (Autumn 2013)			
	A small resource area, overlain by some built development. The deposit extends under the M42 motorway,		
Crude estimate of resource:Area: 11ha x average depth: 4.1m ÷ 2 Estimated resource volume: 225,500 m³ Estimated resource tonnage (at 2 t/m³): 451,000 tonnes	Area: 11ha x average depth: 4.1m ÷ 2 Estimated resource volume: 225,500 m ³		
Conclusion:Not significant: Small deposit with less than 300,000m³. Not for consideration in defining areas of search.	Not significant: Small deposit with less than 300,000m ³ .		
Assessment of resource for the Third Stage consultation on MLP (Spring 2015)			
Revised estimate of resource:Area: 11ha x average depth: 4.1m ÷ 2 Estimated resource volume: 225,500 m³ Estimated resource tonnage (at 1.65 t/m³): 372,075 tonnes	Area: 11ha x average depth: 4.1m ÷ 2 Estimated resource volume: 225,500 m ³		
Conclusion: Not significant.			

Overview		
Resource number: Resource name: Resource area: Resource depth: Location OS sheet reference: National grid ref:	13/11 Upton Warren 2 ha 3.5 m SO 96 NW 393643, 267645	52 52 54 55 55 55 57 52 55 55 55 55 55 55 55 55 55
Resource description:		
Resource description:		3ha) has been proposed by the landowners S Hudson and T Dunkley. The majority of hin resource area 13/8, the remainder (approximately 2ha) has been assessed as
	This resource area is no	ot shown to have any superficial deposits on BGS digital maps.
	Evaluation" (dated Octo comprising a total of 14 mineral deposit compris ranged between 0.75m	ed a geological report "Land at Upton Warren Preliminary Mineral Resource ober 1998) which showed the results of site investigation carried out in August 1998 excavated trial pits. Sand and gravel was intersected in all the trial pits with the sing a dense silty and slightly clayey sand and gravel. Proven deposit thicknesses in trial pit 02 (in this resource area) and greater than 3.8m in trial pit 04 (in resource concludes that across the whole (5.3ha) area, the recoverable mineral tonnage was nnes.
	The former pit at Upton	Warren to the east of this resource area was worked to a depth of approximately 5m.
Assessment of resourc		tation on MLP (Autumn 2013)
Commentary:	This resource area was	not assessed for the second consultation on the MLP. It was proposed as a resource

	in response to that consultation by the landowners S Hudson and T Dunkley.		
Crude estimate of	Not assessed for the second consultation on the MLP.		
resource:			
Conclusion:	Not assessed for the second consultation on the MLP.		
	ce for the Third Stage consultation on MLP (Spring 2015)		
Commentary:	A resource area of less than 10 ha (assessed because it has been proposed for consideration as a specific site with accompanying geological data). No built development in the resource area.		
Revised estimate of resource:	There are three options to estimate the resource tonnage in this resource area:		
	1. Standard method:		
	(Estimated resource depth based on mean average of: a) former pit at Upton Warren: 5m, b) trial pit range (0.75m and 3.8m): 2.28m = 3.6m)		
	Based on resource area and the above estimated average depth, the estimate of resource in this resource area would be:		
	Area: 2ha x average depth: 3.6m ÷ 2		
	Estimated resource volume: 36,000 m ³		
	Estimated resource tonnage (at 1.65 t/m ³) would be: 59,400 tonnes		
	2. Proportion of total site estimate: The submitted geological report concluded that across the whole (5.3ha) site, the recoverable mineral tonnage was estimated at 142,000 tonnes. Based on this resource area being 2ha (or 38%) of the total 5.3ha site, the estimated resource tonnage would be: 53,585 tonnes.		
	3. Trial pit data: Based on the location of the Trial Pits shown in the submitted geological report, it is assumed that Trial Pits TP01, TP03, TP12, TP13 and TP14 fall within this resource area. The Trial Pit Logs for these pits reveal an average depth of 3.5m+. Based on the resource area and this average depth, the estimate of resource in this resource area would be: Area: 2ha x average depth: 3.5m ÷ 2 Estimated resource volume: 35,000 m ³ Estimated resource tonnage (at 1.65 t/m ³) would be: 57,750 tonnes		
	The trial pit logs in option 3 are considered to be the best available data about this resource area. Therefore: Estimated resource tonnage: 57,750 tonnes		
Conclusion:	Not significant.		