

LOCAL AGGREGATE ASSESSMENT FOR LONDON 2016

DECEMBER 2016
GREATER LONDON AUTHORITY FOR THE LONDON BOROUGHES

EXECUTIVE SUMMARY

- London consumed over 9mt of primary (land-won and marine-dredged) aggregates in 2014, a slight increase on the previous year.
- Only a small percentage of London's aggregate needs can be met from primary production sourced within London due to the very limited nature of this resource.
- Over 80% of primary aggregate supply is by imports of crushed rock and marine-dredged sand and gravel.
- London is thought to rely on a high percentage of non-primary aggregates, principally re-used Construction, Demolition and Excavation Waste.
- London is one of the few regions of the UK to have grown both economically and demographically in recent years.
- The supply patterns identified above are likely to continue.
- Given the high level of imports, London's wharves and rail depots are increasingly important.

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1 INTRODUCTION

- 1.1 Aggregates (sand and gravel, and crushed rock) are the raw materials used to make construction products. They are an essential part of everyday life and can be found in our roads, houses and offices.
- 1.2 There are three main sources of aggregates in the UK: land-won; marine-dredged (both classed as primary aggregates); and non-primary aggregates. Land-won aggregates (includes sand and gravel and rock) are materials extracted directly from the ground via quarries. Marine-dredged aggregates comprise sand and gravel dredged from the sea-floor in licensed areas of the UK continental shelf. Non-primary aggregates are a by-product of mineral/industrial processes and recycled aggregates are materials produced by treatment of construction, demolition and excavation waste (CD&E).
- 1.3 The National Planning Policy Framework (introduced March 2012) placed a new requirement on all mineral planning authorities. NPPF paragraph 145 states: *“Minerals planning authorities should plan for a steady and adequate supply of aggregates by preparing an annual Local Aggregate Assessment, either individually or jointly by agreement with another or other mineral planning authorities, based on a rolling average of 10 years sales data and other relevant local information, and an assessment of all supply options (including marine dredged, secondary and recycled aggregates)...”*
- 1.4 The Greater London Authority Act (1999) (as amended) is clear that the Mayor is not a minerals planning authority, and as such, is not required to produce a Local Aggregate Assessment (LAA). This duty lies with the 33 London boroughs – London’s mineral planning authorities. However, the picture in London is complicated by the fact that only four boroughs have land-won aggregates – Havering and Redbridge in East London, and Hillingdon and Hounslow in West London. The Mayor does not believe it is reasonable or proportionate to expect the boroughs to produce a number of LAAs between them which would largely duplicate each other on aggregates landed at wharves and rail depots, together with data on CD&E waste. Therefore, in an effort to promote a good working relationship with the boroughs, the Mayor has produced this LAA.
- 1.5 Tables 1, 1A and 1B clearly show that London is a significant importer of aggregates. Figure 1 (at the end of this report) shows the location of the railheads that receive crushed rock (principally from the South West and the East Midlands), the wharves in London at which marine-dredged aggregates are landed from the Thames Estuary/North Sea/East English Channel, and the location of active quarries (these are also listed in Appendix A). It is vital for those boroughs with

wharves and/or railheads to safeguard them for the future (as para 143 of the NPPF requires) as they handle so much of London's primary aggregate supply.

Table 1 The Overall Picture for Aggregates in London (mt)

type of aggregate	consumption 2013	consumption 2015
Total (All Sources)	15.5	11.0 – 15.6
Non-primary*	6.1	1.4 - 6.0
Total (Primary)	9.4	9.6
marine-dredged	4.4 (47%)	3.9 (41%)
crushed rock	3.6 (38%)	3.9 (41%)
land won beyond London	1.1** (12%)	1.6 (17%)
land won within London	0.3 (3%)	0.3 (3%)

Source: LAWP Annual Aggregates Monitoring Report - various years

* See section 2 for calculation of non-primary figure

** Estimate assumes same as 2009

Table 1A Imports of Aggregates into London 2014 (mt)

	SW	SE	EM	EE	WM	South Wales	Rest of World	London	Total
Land-won S&G	0.09	0.5		1.0					1.59
Marine S&G		0.39		0.07				4.7	5.14
Crushed Rock	1.51		0.89	0.01	0.07	0.17	1.24		3.89
Total	1.6	0.89	0.89	1.08	0.07	0.17	1.24	4.7	10.6

Table 1B Exports of Aggregates from London 2014 (mt)

	South East	East of England	Total
Land won S&G	0.13		0.13
Marine Dredged	0.33	0.96	1.29
Total	0.46	0.96	1.42

1.6 In this report, each type of aggregate is discussed in individual chapters.

2 NON-PRIMARY AGGREGATES

- 2.1 There is no single definitive source of data on non-primary sources of aggregates. In London, the bulk of non-primary material is thought to be the re-use of construction, demolition and excavation waste (CD&E). There are different ways to estimate a figure for CD&E waste.
- 2.2 A 2005 survey undertaken for DCLGⁱ estimated London had just over 8mt of CD&E waste – 9% of the national total of c.89mt. In March 2012 Defra produced a revised methodology for forecasting CD&E wasteⁱⁱ, and this estimated an England-wide figure for 2010 of just over 77mt of CD&E waste. Assuming that London still generated 9% of the national total, this equated to 6.9mt. In updating the London Plan with Further Alterations (January 2014), the Mayor commissioned work on updating figures on all three waste streams (Household, Commercial as well as CD&E).
- 2.3 The work by SLR Consulting takes the 6.9mt figure, divides it by the 2010 Population for London 8.1m from GLA Demographics to give a CD&E per person figure of 0.9mt. This figure is then held constant and multiplied by population figures forecast by GLA Demographics to give future projections of CD&E waste. These are shown, at borough-level, in Figure 2. If London is achieving an 80% re-use rate (in line with London Plan objectives) then 5.5 mt was being reused in 2010. Table 2 provides a London level summary of this data to give projections of possible amounts of CD&E waste that will be reused as alternative aggregates. The 2010 figure is around about the average for 2005-2016.

Table 2 Policy Position for CD&E Waste in London (mt)

	2005	2010	2016	2021	2026	2031
CD&E total	8.0	6.9	7.5	7.9	8.2	8.4
@ 80% CD&E reuse	6.4	5.5	6.0	6.3	6.6	6.7

- 2.4 The 2014 and 2015 Annual Aggregates Monitoring Report includes estimated figures for CD&E waste. These are much lower, in a range of 1.4mt to 2mt. These figures also need to be treated with caution as they were derived in the following way. For the 2014 and 2015 Annual Monitoring Report a desk top study was undertaken of available data on recycled aggregate in London. For a number of reasons, the data from the Environment Agency does not capture all activities.

- 2.5 The work estimates that c. 11.1mt of CD&E material arrives at permitted sites. Of this, it is estimated that 2.8mt is suitable for recycled aggregate processing, around half of this (1.4mt) could be used as aggregate, depending on the capacity of the operator.

3 MARINE DREDGED SAND AND GRAVEL

- 3.1 Table 1 shows that London is highly dependent on marine-dredged sand and gravel and Figure 1 shows the wharves in London where this material was landed in 2015. Data from the Crown Estateⁱⁱⁱ, summarised in Table 3 below, shows for 2015 the amounts of marine-dredged sand and gravel by licensed area delivered into the Thames Estuary. This totalled over 8mt in 2015. The Thames Estuary includes wharves in Thurrock and Kent as well as Greater London. Table 3 also shows the small area that was actually dredged in comparison to the area licensed for dredging.

Table 3 Dredging Licensed by Crown Estate delivered to Thames Estuary 2015

Region	Total Area Licensed (km ²)	Total Area Dredged (km ²)	Total Construction Aggregate (mt)	Total Delivered to Thames Estuary (mt)
Humber	213.1	9.4	1.3	0.02
East Coast	244.2	24.4	4.5	4.1
Thames	54.7	11.1	1.5	1.3
East English Channel	113.5	15.4	3.7	2.6
South Coast	118.7	13.4	3.1	0.3
Total	744.2	73.7	14.1	8.32

- 3.2 The AMR 2015 provides data not only on marine dredged sand and gravel landed at wharves in London but on the small amounts of crushed rock and land-won sand and gravel landed at wharves as well. This data is shown in Table 4. The 2015 figure of 5mt for marine dredged sand continues a rising trend found over the last five years.
- 3.3 The Crown Estate produces a Marine Aggregates Capability & Portfolio document^{iv} showing that the three regions that mainly supply London and the south east had reserves of some 225mt in 2015. At the current extraction rate, the reserve would be able to maintain such supplies to London and south east markets for some 24.7 years, up from 21.5 years in 2013. In addition there are over 8mt in current applications for licences.

Table 4 Wharves: Sales of Marine Dredged Sand Gravel, Crushed Rock and Land-won Sand and Gravel 2005-2015 (000s tonnes)

	Marine Dredged		Crushed Rock		Land Won		All Sources	
Year	Sales	%	Sales	%	Sales	%	Sales	% Change
2005	3,906	87.0%	413	9.0%	156	4.0%	4,475	3.0
2006	3,651	77.0%	671	14.0%	436	9.0%	4,758	6.0
2007	4,132	88.0%	425	9.0%	128	3.0%	4,685	-3.0
2008	4,350	89.0%	360	7.0%	202	4.0%	4,912	5.0
2009	3,516	87.0%	359	9.0%	146	4.0%	4,021	-18.0
2010	3,007	85.0%	379	11.0%	135	4.0%	3,521	-12.0
2011	3,638	82.0%	655	15.0%	160	3.0%	4,453	26.0
2012	3,775	83.0%	629	14.0%	144	3.0%	4,548	2.0
2013	4,357	86.0%	581	14.0%	118	0.0%	5,056	14.0
2014	4,596	86.0%	666	12.0%	107	2.0%	5,369	6.0
2015	4,959	93.0%	381	7.0%	0	0.0%	5,340	-1.0
Av.	3,998		511		158		4,666	

Source : AM Surveys 2005-2015

*AM2009 did not distinguish land-won from marine, so 4% applied for land-won

4 CRUSHED ROCK

- 4.1 London has no suitable rock of its own so Table 1 above shows London's dependence on crushed rock imports to meet its needs and Figure 1 shows the location of the active railheads where material can be brought into London by train (also listed in Appendix 1). Table 5 shows the trends in the last decade in crushed rock imports, as well the small amounts of both marine and land won sand and gravel imported to London by rail. The 2013 figure of 3.1mt is just above the 10 year average of 3.0mt.

Table 5 Rail Depots: Sales of Crushed Rock, Marine and Land-won Sand and Gravel 2005-2015 (000s tonnes)

Year	Crushed Rock		Marine Dredged		Land Won		Total
	Sales	%	Sales	%	Sales	%	Sales
2005	2,662	67%	969	24%	355	9%	3,986
2006	3,137	69%	889	20%	518	11%	4,544
2007	3,152	67%	1303	28%	259	5%	4,714
2008	3,391	69%	1165	23%	372	8%	4,928
2009	2,370	67%	953	27%	192	6%	3,515
2010	2,608	71%	938	25%	147	4%	3,693
2011	3,580	72%	1258	25%	117	3%	4,955
2012	2,777	71%	1,021	26%	115	3%	3,913
2013	3,100	70%	1,199	27%	122	3%	4,421
2014	2,464	67%	1,111	30%	127	3%	3,702
2015	2,747	63%	1,496	34%	96	2%	4,339
Av.	2,933		1,133		207		4,272

Source: AM Surveys 2005-2015

- 4.2 The main source of crushed rock comes from the South West. The Somerset Local Aggregate Assessment 2014^v contains data on crushed rock. It shows that the 10 year average of sales for the period 2005-2014 was 10.7mt, below their apportionment of 13.4mt. With permitted reserves of 400mt their current land bank will last almost 30 years at their current apportionment or over 37 years at their 10 year sales average.

- 4.3 Material from the East Midlands, principally Leicestershire^{vi} is also important to London. The joint Leicestershire/Rutland LAA shows 10 year average sales of 13.8mt, against an apportionment of 16.4mt so the current land bank of 425mt will last approximately 30 years at their 10 year sales average.

5 LAND-WON SAND AND GRAVEL

5.1 The locations of active quarries in London are shown on Figure 1 and listed in Appendix A. In the London Plan (latest edition published March 2016) Policy 5.20 sets out the Mayor's approach to land-won sand and gravel in London.

5.2 London Plan Policy 5.20 Part D states:

LDFs should make provision for the maintenance of a landbank (i.e. seven years' supply) of at least 5 million tonnes of land won aggregates throughout the plan period to 2031 by a landbank apportionment of:

- a at least 1.75 million tonnes to LB Havering*
- b at least 0.7 million tonnes to LB Redbridge*
- c at least 1.75 million tonnes to LB Hillingdon*
- d at least 0.7 million tonnes to LB Hounslow*

5.3 This figure of at least 700,000 tpa was accepted by the London Plan EiP Panel and, in turn, by the Secretary of State as a figure London could realistically deliver. This is below the National Guideline figure for London of 1.1mtpa (18mt over the 2005-2020 period) and below the previous London Plan Apportionment of 1.0mt. In London Plan paragraph 5.93 boroughs with potential supply are encouraged to bring it forward, as doing so would help improve London's performance.

5.4 Table 6 below shows London's progress over the last decade on land-won sand and gravel. It shows the current 10 year average to be just below the current apportionment thanks to higher levels of production in the earlier part of the decade. It is worth noting that in London's best year 2007, the figure of 1.1mt would only equate to c.7% of consumption (see Table 1 above) and even if London were to achieve comparable levels to 2007 in future years London would still be a massive importer of aggregates.

5.5 Policy 5.20 makes reference to a landbank, seven years for sand and gravel. Aggregate landbanks are principally a monitoring tool to indicate possible shortages in the provision of an adequate and steady supply of land-won aggregates in an area. Table 7 below shows that London has almost no landbank of permitted reserves remaining – as current reserves are being worked out they are not being replaced with new permissions. Last year one application in Hounslow was refused, and a re-submission is likely. Another application in Havering was refused, and this has gone to appeal. An application is likely in Redbridge this year. Even if all these three are permitted and implemented and produce an average of 100,000 tonnes p.a., this would take sales to c.600,000

tonnes p.a. – ie still below apportionment. Accordingly, the current review of the London Plan, will re-consider the apportionment in the light of the requirements of the NPPF and PPG and the development needs of London.

Table 6 Quarries: Sales of Sand and Gravel 2005-2015 (000s tonnes)

Year	Total Sales	% change from last year
2005	1,038	-4
2006	957	-8
2007	1,142	19
2008	826	-28
2009	577	-30
2010	679	18
2011	658	-3
2012	320	-51
2013	379	18
2014	375	-19
2015	302	-2
Average Sales	622	

Source: AM Surveys 2005-2015

Table 7 Sand and Gravel Land bank 2005-2015

Year	Apportionment (mt)	Reserves (000s tonnes)	Landbank remaining (Years)
2005	1.0	2,866	2.9
2006	1.0	3,084	3.1
2007	1.0	2,052	2.1
2008	1.0	1,512	1.5
2009	1.0	1,981	2.0
2010	0.7	1,380	2.0
2011	0.7	1,120	1.6
2012	0.7	1,180	1.7
2013	0.7	1,376	2.0
2014	0.7	702	1.0
2015	0.7	1,406	2.0
% Change		-51%	

Source: AM Surveys 2005-2015

6 CONCLUSIONS

- 6.1 Table 8 below takes the 10 year sales averages for marine dredged sand and gravel (Table 4), crushed rock (Table 5), and land-won sand and gravel (Table 6). It includes a range of estimates for CD&E waste.

Table 8 – Average Sales 2005-2015 (mt)

	10 yr Average Sales
Primary	
Marine Dredged Sand & Gravel (imported via wharves)	3.9
Crushed Rock (imported via rail depots)	2.9
Land won Sand & Gravel	0.6
Primary - Total	7.4
Non-Primary	
Re-use CD&E	1.4 – 6.0
Total (All Sources)	8.8 – 13.4

- 6.2 The data in this report shows that prospects for maintaining an adequate supply of aggregates to London are good. This is due to the reserves of marine dredged sand and gravel and crushed rock being sufficient to maintain or increase supplies to 2031. In addition, a rising population and high levels of construction activity will produce increasing amounts of CD&E waste for re-use as aggregate by 2031 (see Tables 9 and 10 below). The main issue applies to land-won sand and gravel where the average sales 2005-2015 are below the adopted London Plan apportionment. In recent years, sales have fallen to almost half of 10 year sales.
- 6.3 London's land bank of permitted reserves has only 2 years to run. The land bank shortfall will not be overcome until further applications for sand and gravel extraction are submitted and permitted. A number of applications are currently awaiting determination and, if approved, would substantially increase reserves, land bank and production capacity.

- 6.4 London's imports of marine dredged sand and gravel and crushed rock rely on wharves and railheads remaining available to allow supplies into London. In addition, London's reliance on crushed rock depends on local planning authorities in other parts of the country accepting disturbance to their residents to allow minerals operators to continue to exploit material for London's benefit.
- 6.5 The London Plan (March 2016) estimates that London's population will continue to grow from c.8.2 million in 2011 to c.10.1 million by 2036. It anticipates that employment will grow from c.4.9m jobs in 2011 to c.5.8m by 2036. Wharves and railheads are already under increasing pressure from nearby development or to be released for residential development. This will increase further if the dwelling targets in the Plan of c.42,400 dwellings pa 2015-2025 are to be achieved. Table 9 below shows possible major construction schemes that could occur in London and Table 10 shows housing delivery. These are discussed in greater detail below.
- 6.6 There are a number of major construction schemes that could be delivered in London (and beyond) in the near future. These are;
- TfL are proposing a **Bakerloo line extension (BLE)**, south-east from the Elephant & Castle to Lewisham via the Old Kent Road, in two 7.5km tunnels. Work would begin in the 2020's and be finished by 2030.
 - TfL are working with the Department for Transport on **Crossrail 2**, a train service proposed to run from Surrey through SW London to Hertfordshire via NE London, via 37kms of twin bore tunnels under central London. TfL hope to have consent by late 2018 with construction beginning in 2021 and the scheme operational by 2030. There are multiple tunnelling options for the scheme providing a range of possible levels of CD&E waste.
 - The Government is proposing **HS2** to improve connectivity between London and Birmingham, initially. The scheme will be in a tunnel under London to/from Euston. It will involve the redevelopment of Euston itself and c.20 km of twin tunnels under London. Initial construction work is due to begin in 2017 and tunnelling in late 2019. The Environmental Statement for HS2 indicates that the peak period for construction activity will be from 2017-2025.
 - TfL has consent for a **Northern Line extension (NLE)** from Kennington via an intermediate station at Nine Elms and a terminal at Battersea. The Transport and Works Act order was granted in November 2014 with tunnelling due to begin in 2016. The extension would become operational in 2020. The Environmental Statement puts forward two options, Option A generates a total of 905,280 tonnes and Option B 915,260 tonnes of CD&E waste.

- TfL are promoting an additional road based river crossing between north Greenwich and Silvertown to relieve congestion in the Blackwell tunnel and improve connectivity in east London. TfL hope to have a decision on the **Silvertown Tunnel** by 2018, with construction beginning in 2018 with the scheme completed by 2023. The Preliminary Environmental Information Report (Oct 2015) (PEIR) estimates there would be a total of 807,600 tonnes of CD&E waste generated from 2 tunnels, each 1 km long.
- Thames Water has a Development Consent Order for the **Thames Tideway Tunnel**, to upgrade the capacity of London's sewer network. The new sewer will have 25 kilometres of tunnel, taking the waste from across London to Abbey Mills pumping station. Preliminary construction is due to start in 2016 with tunnelling taking place 2017-2021. In addition to the tunnel there will be 5 shafts, varying in depth from 30m to 66m. The Environmental Statement sets out data on expected totals of CD&E waste at 4,890Kt, with peak years of waste generation being 2018 and 2019.

6.7 Table 9 below shows a possible range of CD&E waste all of these schemes could generate if they are progressed. They show a range from 53.1mt – 57mt over the 13 year period or 4.1-4.4 mt pa.

6.8 Table 10 below shows the level of housing completions in London over the last decade, sourced from the London Database Development system –monitored by the GLA but taking approvals and completions data from the boroughs. The 10 year average runs at 32,535 units p.a.

6.9 If these population and employment projections are correct, London will continue to need large quantities of aggregates to build infrastructure, homes and offices. The vast majority of this material is not going to be sourced from quarries within London – hence the continued need to protect the wharves and railheads.

Table 9 Possible CD&E Waste generated by future schemes 2016-2028 (kt tonnes)

Scheme	Est. tunnel length (kms)	CD & E waste	CD & E waste
HS2	40	21,656	
Northern Line Extension	6.4	915	
Silvertown Tunnel	2	808	
Thames Tideway Tunnel	25	4,890	
a) Total from Environmental Statements		28,271	
Possible Estimates			
		@143t/km*	
Bakerloo Line Extension*	15	2,145*	
b) Total a) plus BLE		30,416*	
		Low	High
c) Crossrail 2~	74	22,728~	26,568~
Overall Total (a+b+c)		53,144	56,984

* Estimated based on Environmental Statement for Northern Line Extension

~ Estimated based on discussion with Crossrail 2 team

Table 10 – Net Housing supply in London 2004/5 to 2014/5

Year(s)	Net dwellings
2004/5 - 2007/8	151,400
2009/10	28,377
2010/11	25,740
2011/12	29,871
2012/13	26,854
2013/14	30,668
2014/15	32,440
Total 2004/5 to 2014/15	325,350
Ten year average	32,535

Source London Plan AMR 12

APPENDIX A

Active and *Inactive* Aggregate Quarries, Wharves and Rail Depots at end 2015

SAND AND GRAVEL QUARRIES

LB Bromley

Bourne Wood	Bournewood S&G Ltd	soft sand
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LB Havering

Spring Farm	Havering Aggregates Ltd	sharp sand & gravel
East Hall Farm	Havering Aggregates Ltd	sharp sand & gravel
<i>Moor Hall</i>	<i>Ingrebourne Valley Ltd</i>	<i>sharp sand & gravel</i>

LB Hillingdon

Sipson (including Wall Garden Farm)	Henry Streeter Ltd	sharp sand & gravel
<i>Harlington</i>	<i>Henry Streeter Ltd</i>	<i>sharp sand & gravel</i>

LB Redbridge

<i>Fairlop Quarry</i>	<i>Brett Lafarge Ltd</i>	<i>sharp sand & gravel</i>
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AGGREGATE WHARVES

LB Barking & Dagenham

Dagenham Dock	Hanson Aggregates	marine
Dagenham Dock	CEMEX	crushed rock
Eurovia (No1 Western Extension)	Eurovia Roadstone	crushed rock

LB Bexley

Erith/Pioneer Wharf	Lafarge/Tarmac Ltd	marine
Conway Wharf, Erith	FM Conway	crushed rock

RB Greenwich

Murphy's Greenwich Wharf, Charlton	Lafarge/Tarmac Ltd	marine
Riverside	Lafarge/Tarmac Ltd	crushed rock
Victoria Deep	Hanson Aggregates	crushed rock, marine*
Angerstein	CEMEX	marine
Brewery	JJ Prior	sand & gravel

LB Newham

Dock Entrance	Euromix	marine*
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LB Wandsworth

Battersea	CEMEX	crushed rock, marine*
Pier	Hanson Aggregates	marine*

AGGREGATE RAIL DEPOTS

LB Barking & Dagenham

Dagenham	Hanson Aggregates	crushed Rock
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LB Brent

Wembley	Aggregate Industries	crushed rock, sand & gravel
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LB Camden

Kings Cross	Lafarge/Tarmac Ltd	crushed rock, marine*
Kings Cross	Hanson Aggregates	marine*

LB Croydon		
Purley	Day Aggregates	crushed rock & marine*
LB Ealing		
Acton	Aggregate Industries	sand and gravel & crushed rock
Park Royal	Lafarge/Tarmac Ltd	sand & gravel
RB Greenwich		
Angerstein	Aggregate Industries	crushed rock
LB Hillingdon		
West Drayton	Hanson Aggregates	crushed rock
West Drayton	Lafarge/Tarmac Ltd	crushed rock
West Ruislip	Yeoman Aggregates	crushed rock
Hayes	Lafarge/Tarmac Ltd	crushed rock
LB Hounslow		
Brentford	Day Aggregates	crushed rock & sand & gravel
LB Kingston upon Thames		
Tolworth	Day Aggregates	crushed rock & marine
LB Tower Hamlets		
Bow	Aggregates Industries	crushed rock & marine
LB Wandsworth		
Battersea	Day Aggregates	crushed rock & marine*
Battersea	Lafarge/ Tarmac Ltd	marine*

* transported from another wharf

Figure 1: Active Quarries, Railheads and Wharves in London 2015

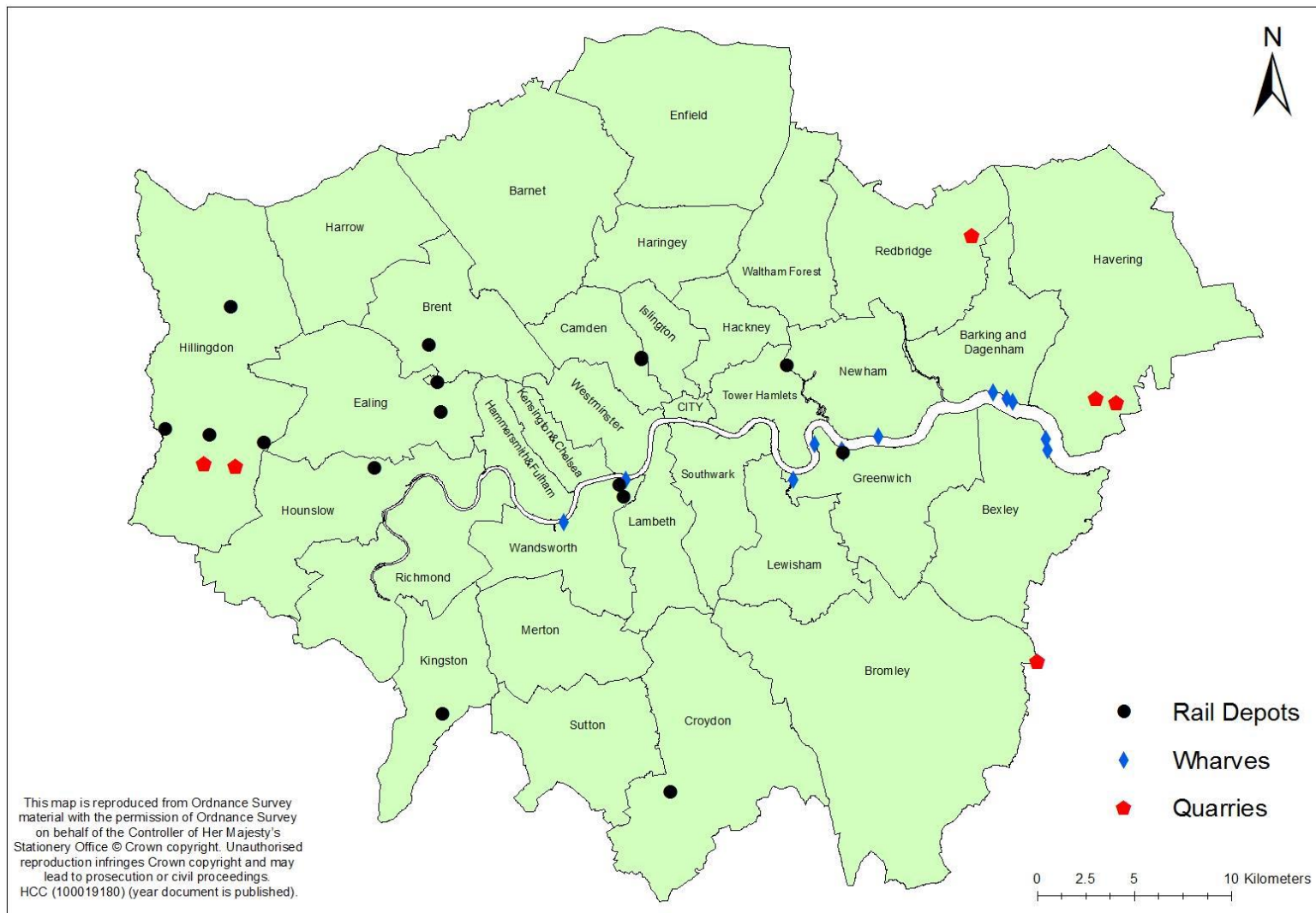


Figure 2 Forecasts of CD&E Waste in London (000s tonnes)

Borough	2010	2016	2021	2026	2031	2036
Barking & Dagenham	157	178	194	207	218	227
Barnet	302	332	352	368	382	395
Bexley	198	207	214	221	226	232
Brent	264	285	301	313	324	333
Bromley	263	278	288	297	305	312
Camden	186	203	209	215	220	225
City*	6	7	7	7	8	8
Croydon	309	329	343	355	364	373
Ealing	287	305	317	327	335	343
Enfield	265	288	305	319	331	342
Greenwich	216	233	244	253	261	268
Hackney	209	230	243	253	262	271
Hammersmith & Fulham	155	157	159	161	163	165
Haringey	216	233	244	251	258	265
Harrow	203	218	228	236	243	250
Havering	202	214	224	234	243	251
Hillingdon	232	258	273	285	296	305
Hounslow	215	237	251	262	270	278
Islington	174	195	205	212	218	224
Kensington & Chelsea	136	133	133	133	134	136

Borough	2010	2016	2021	2026	2031	2036
Kingston	135	148	154	159	163	167
Lambeth	258	278	290	297	304	312
Lewisham	235	254	267	277	285	293
Merton	169	182	191	198	203	208
Newham	261	294	316	333	347	359
Redbridge	237	261	278	294	307	318
Richmond	159	169	174	179	182	185
Southwark	243	266	277	285	293	300
Sutton	162	174	183	190	195	201
Tower Hamlets	214	248	268	281	293	303
Waltham Forest	219	240	254	267	277	286
Wandsworth	260	275	282	287	292	297
Westminster	186	200	205	210	214	219
LONDON TOTAL	6,935	7,510	7,873	8,164	8,417	8,649

**Due to unique characteristics of the City, this figure is likely to be an underestimate*

ENDNOTES

i

<http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/publications/planningandbuilding/surveyconstruction2005>

ii <https://www.gov.uk/government/publications/construction-and-demolition-waste>

iii http://www.thecrownestate.co.uk/media/458910/marine_aggregates_area_involved_15th_report.pdf

iv *Marine Aggregates Capability & Portfolio 2013. The Crown Estate March 2014*

v www.somerset.gov.uk/mineralsandwaste

vi http://www.leics.gov.uk/leicestershire_and_rutland_local_aggregate_assessment.pdf