



What is the Lambeth Group?

Geological Formations and Groups

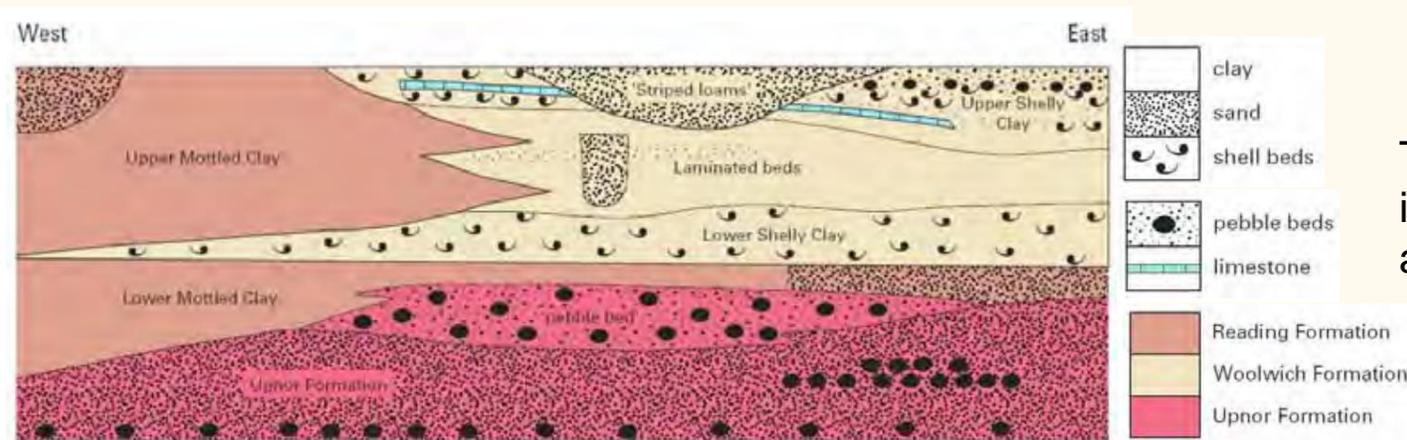
Geologists classify rock layers into distinct units so that they can create useful maps and study what the Earth was like in the past.

A **Formation** is a rock unit that is thick enough and extensive enough to plot on a map. It must be identifiable and appear distinct from the surrounding rock layers.

A **Group** is a succession of two or more associated **Formations**.



Adapted from **London's Foundations: Protecting the Geodiversity of the Capital (2012)**
Figure 15 Relationship of Lambeth Group informal lithological units in central London



The **Lambeth Group** consists of three distinct Formations:

- Upnor Formation
- Reading Formation
- Woolwich Formation

The Upnor Formation is overlain by the Reading Formation in the west, by the Woolwich Formation in the east, and by a complex interdigitation of both in between.

Where are Lambeth Group layers found?

The Lambeth Group strata occur throughout the London and Hampshire Basins of southern England.

Their position above the Chalk and beneath the London Clay tells us they must have been laid down before the Clay but after the Chalk.



Lambeth Group sediments are generally thickest in south-west London where they can reach 30 m. Across most of the London area they are between 10 and 20 m thick.

In some parts of south-east London, the Lambeth Group was eroded away before the Harwich Formation was laid down so that the layers are thin or not found at all.

Harefield Pit SSSI (Site of Special Scientific Interest)



Allan Wheeler (HHGS Field Officer) points to the Lambeth Group (Upnor Formation) gravels immediately above the Chalk at Harefield Pit SSSI.

Which rocks occur in the Lambeth Group?



Sands at Harefield SSSI representing a river channel

The Lambeth Group strata comprise a complex of vertically and laterally varying gravels, sands, silts and clays deposited between 56-55 million years ago during the Ypresian stage of the Eocene epoch of the Paleogene period).

The typical sediments are interbedded colour-mottled clays and fine silty sands, with occasional shell beds, thin limestones and some beds of sandy gravel containing black, very well-rounded flint pebbles.

The colour mottling is a consequence of weathering under conditions of a warm climate with a distinct dry season. It is associated with duricrust formation such as silcrete and calcrete.

Upnor Formation

The Upnor Formation comprises fine to medium-grained sand with iron-rich clay and flint pebbles. It may show trace fossils or contain oyster shells or other carbon fragments. It is mainly dark grey to greenish-grey in colour, but the top part (and in some places the whole thickness) has been oxidised to brown, orange, red, and purple-brown. The sand is coarse and the lower beds may be gritty. A basal bed of rounded flint pebbles up to 1 m thick is usually present, but is not persistent.

Adapted from **London's Foundations: Protecting the Geodiversity of the Capital (2012)**

Marine sediments were laid down at the bottom of a warm, shallow sea. Sea levels were falling at the time, which meant that the marine deposits became exposed as land. The Upnor formation sediments were therefore exposed to erosion at that time, resulting in a gap in the geological record.

There are pebble beds at the top of the Upnor Formation, some of which have been silica-cemented forming extremely hard patches known as silcrete. Cementation indicates the emergence of the Upnor Formation above sea level. Famous examples of silcrete in the Upnor Formation are sarsen stones found scattered locally and the beautiful 'Hertfordshire puddingstone' which is decorative when polished.



Above: Hertfordshire Puddingstone exhibited at the Uxbridge Rock Show. Below: Sarsen boulder at Manor Farm, Ruislip



Reading Formation

Reading Formation sediments are found mainly in the north and west of the London Basin and in the Hampshire Basin.

They were deposited in an area of marshy coastal plains crossed by rivers. Typically we find a series of lenticular mottled clays and sands, some pebbly beds and some unusually fine sand. Fossils are rare.



Fine sand coming from a badger's sett at Harefield Pit SSSI. The sand of the Reading Formation is easy for the badgers to excavate.

Reading and Woolwich Formation boundary

To the east of London we find evidence of nearshore marine conditions, perhaps a river estuary or lagoon. These deposits, called the Woolwich Formation, comprise grey clays, pale sands and estuarine shells including a well-marked oyster bed. Lignite deposits are found and in places calcrete has formed (not silcrete).

The Reading and Woolwich Formations are divided by a sequence boundary, marking a period of sea level fall, emergence of the marine deposits from the lower part of the Lambeth Group and their consequent weathering and local erosion. This boundary marks onset of the 'Paleocene-Eocene Thermal Maximum', a relatively short-lived period of global warming.

This division seems to disappear westwards within the Reading Formation.

2017 field trip to Gilbert's Pit, Charlton, SE London. We saw oyster beds from the Woolwich Formation

