

Zig Zag Quarry - Summary of Key Elements

Location:	In South Devon at Aller near Newton Abbot immediately east of the A380 main road from Newton Abbot to Torquay
O.S. Grid Ref:	SX 878 690 (quarry office)
O.S. Map No:	1:25 000 Explorer Sheet 110, Torquay and Dawlish 1:50 000 Landranger Sheet 202, Torbay and South Dartmoor
BGS Map No:	1:50 000 Sheet 339 Newton Abbot
Operated by:	Harleyford Aggregates.
General Geology:	Aller Gravel of early Tertiary, probably Eocene age about 50 million years old, unconformably overlying mid Cretaceous Upper Greensand about 100 million years old. Both formations dip generally westwards up to 20°
Geodiversity Highlights:	<ul style="list-style-type: none"> • Aller Gravel about 25m of reddish brown/buff silty gravel, sand, silt. • Gravel mainly part-abraded flint pebbles and cobbles from the Chalk. • Rounded pebbles of Palaeozoic rocks indicate a westerly source. • Sedimentary features indicate origin in a fast, sediment-laden river. • Contact with underlying Upper Greensand is irregular and indistinct. • Greensand where seen is fine to medium soft sand with lines of intermittent tabular and angular unabraded chert along the bedding. • Up to 5m of Greensand is seen; full thickness up to 15m unconformable on red beds of the Permian Teignmouth Breccia. • Sedimentary features absent from the sand; features of original deposit preserved as silica in chert, a replacement deposit introduced after the original sand was deposited. • Many fragments of fossil bivalve shells and the foraminifera <i>Orbitolina</i> preserved as silica in the chert. • Greensand originated as shallow-water marine sand near the shoreline.
Geodiversity Context:	<ul style="list-style-type: none"> • Outcrops of Upper Greensand in the area represent the most westerly Cretaceous deposits in England. • The deposit represents a near-coastal location at the western edge of a widespread sea formed by a major rise in sea level. • The time interval between the two deposits represents about 50 million years • Aller Gravel was formed by a fast flowing sediment-laden river flowing from the west and is the lowest deposit of the Tertiary Bovey Basin.

Photo ZI 1.**From SS 8843 6952, elevation 55m AOD****Facing NNE**

General view of 25m face in Aller Gravel in northern part of the quarry showing strongly cross-bedded reddish-brown coarse gravel and sand.

Photo ZI 5**At SX 8795 6895, elevation 35mAOD****Facing ESE**

Aller Gravel with rolled and abraded flint cobbles resting with irregular base on Upper Greensand, contact C-C. Apparent NNE dip at this location counter to normal westward dip

Photo ZI 15 From SX 8811 6899, elevation 56m AOD (face height 15m) Facing NE

Contact of Aller Gravel with underlying Upper Greensand is frequently irregular and indistinct, approx. C-C above. Aller Gravel contains rounded and abraded pebbles and cobbles, Greensand contains tabular/blocky cherts not abraded and aligned parallel to bedding.

**Photo ZI 7
From a loose block**

Marine fossil shells in loose block of Upper Greensand chert.

Photo ZI 17 From a loose block



Fossil burrows originally in sand, now preserved as silica in Upper Greensand chert. No trace of these burrows can be seen in the sand

Photo ZI 18

From a loose block.



Abundant *Orbitolina* sp. a large variety of fossil foraminifera with a disk like shape, example indicated **F** showing the characteristic 'mexican hat' cross section. Originally a carbonate shell sand of the Upper Greensand, the sediment has been silicified and is now a chert. Lens glass is 1.3cm diameter.

Foraminifera are microscopic single-celled organisms or colonies of single cells and are commonly used as age indicators in sedimentary rocks. In this case the large variety *Orbitolina* is a characteristic fossil of shallow marine rocks of mid-Cretaceous age in South Europe, North Africa and the Middle East. Devon is about as far north as it occurs.