

## SOUTH WEST REGION ADDRESSES

### REGIONAL OFFICE

Environment Agency  
South West Region  
Manley House  
Kestrel Way  
Exeter EX2 7LQ  
Tel: 01392 444 000  
Fax: 01392 444 238

### SOUTH WESSEX AREA OFFICE

Environment Agency  
Rivers House  
Sunrise Business Park  
Higher Shaftesbury Road  
Blandford DT11 8ST  
Tel: 01258 456 080  
Fax: 01258 455 998

### DEVON AREA OFFICE

Environment Agency  
Exminster House  
Miller Way  
Exminster  
Devon EX6 8AS  
Tel: 01392 444 000  
Fax: 01392 316 016

### CORNWALL AREA OFFICE

Environment Agency  
Sir John Moore House  
Victoria Square  
Bodmin PL31 1EB  
Tel: 01208 78301  
Fax: 01208 78321

### NORTH WESSEX AREA OFFICE

Environment Agency  
Rivers House, East Quay  
Bridgwater TA6 4YS  
Tel: 01278 457 333  
Fax: 01278 452 985



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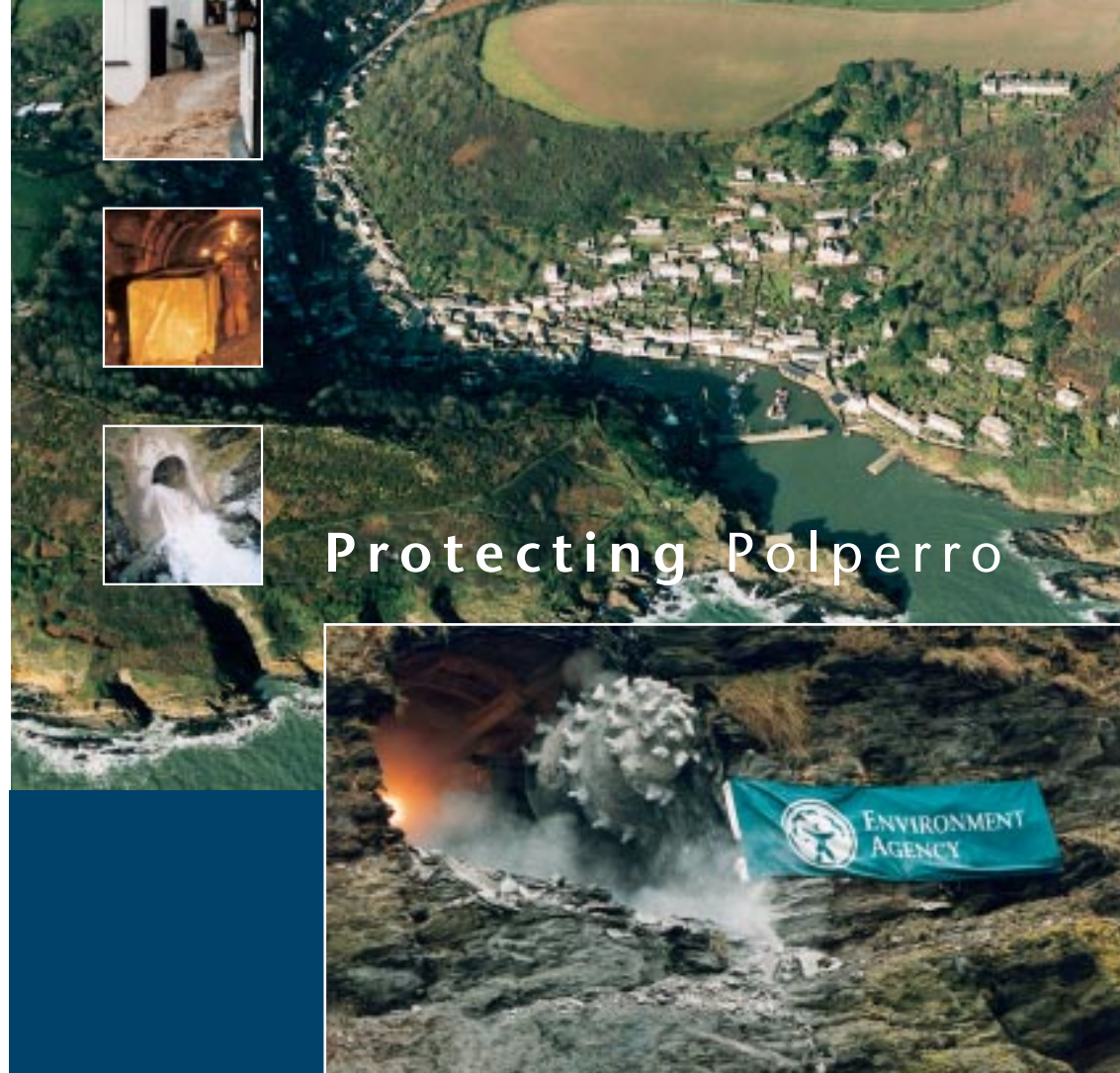
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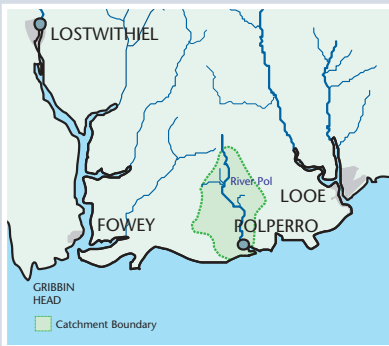


ENVIRONMENT  
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## Protecting Polperro

Polperro is a picturesque fishing village situated on the South East Cornwall coast, between Looe and Fowey, some 30 km west of Plymouth. Polperro means "river port" in Cornish.

The River Pol has a catchment area of 13.2 square kilometres with its principal source at Tremaine, 150m above sea level. It runs through a V-shaped valley, with sides rising at slopes of up to 45° before joining with the Langreek Stream, its main tributary, at Crumplehorn, north of the village.



The village lies at the mouth of the River Pol. It has been developed within the limited area of level ground on the river flood plain with several man-made encroachments upon the river including river walls, inadequate culverts, bridges and properties overhanging the river.

The village has been extremely vulnerable to 'flash flooding' associated with high intensity rainfall. Due to the extremely rapid run-off from the valley, the catchment responds quickly, giving little warning of flood events.



## A history of flooding

There is a recent history of flooding in Polperro and the Environment Agency acknowledged the need for a flood defence scheme.

Two major floods have engulfed Polperro in the past 25 years. The first happened on the 24th September 1976, when 83 residential and commercial properties were flooded and one elderly man drowned. The second and most recent serious event occurred just seven years ago, on the 30th December 1993: it flooded 99 homes and businesses.

In both cases, high intensity rainfall and inadequacy of the watercourse running through the village were to blame. A build-up of debris at several critical sections worsened the impact of the flooding even further. Detailed studies undertaken by the Environment Agency revealed that flooding events of a similar magnitude could be expected to occur, on average, every 15 to 20 years.

In the lower lying harbour area of the town, where there is a tidal influence, a small number of properties are still subject to tidal flooding at regular intervals.



Scenes of flooding around the village

### Scheme options

The Environment Agency considered several flood alleviation options to address the problem of flooding. These included the following:

#### Channel Improvements

Work on the river channel to increase flow capacity at the most critical locations, and improve screening to prevent blockages. This would have provided greater protection to the lowest lying properties but the overall number of properties at risk of flooding would not have been significantly reduced.

#### East Tunnel

Construction of a flood relief tunnel from the main car park, to the east of the River Pol, discharging outside of Polperro harbour at Scilly Cove.

#### West Tunnel

Construction of a flood relief tunnel from the main car park, to the west of the River Pol, discharging at Swallow Cove approximately 800m west of Polperro harbour.

#### Flood Control Dams

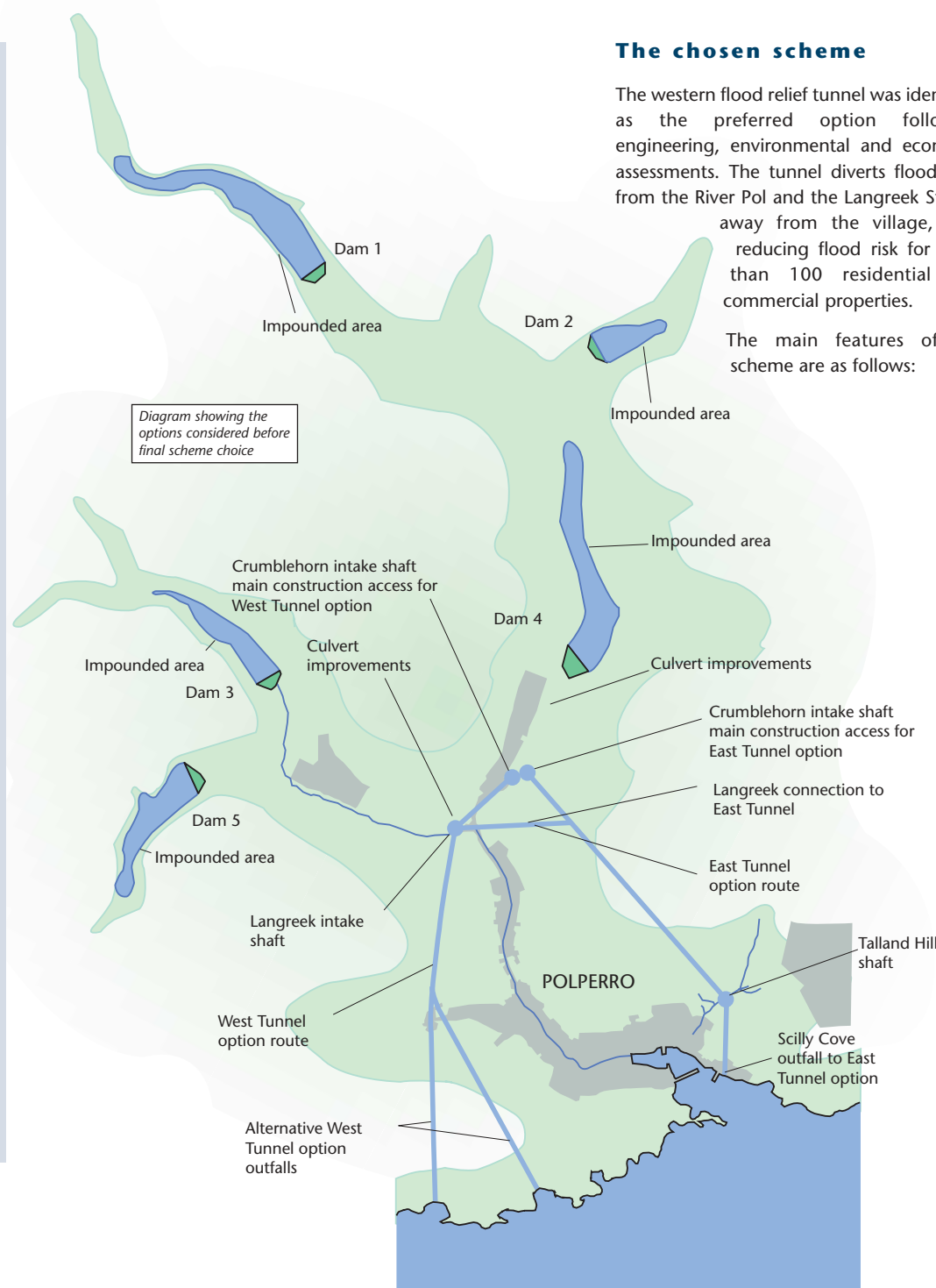
Five dams located on the River Pol and Langreek Stream, fairly high in the catchment. Each flood storage reservoir would require a spillway and a stilling basin to protect against a possible breach, and a complex system of electronically controlled floodgates. The spillway height of the dams would have varied between 10m and 12.5m. Permanent access roads and the diversion of an existing highway would also have been necessary.

### The chosen scheme

The western flood relief tunnel was identified as the preferred option following engineering, environmental and economic assessments. The tunnel diverts floodwater from the River Pol and the Langreek Stream away from the village, thus reducing flood risk for more than 100 residential and commercial properties.

The main features of the scheme are as follows:

- A large debris screen is located at the top end of Crumplehorn car park where the River Pol flows into a culvert beneath the car park. Its purpose is to prevent debris from entering the tunnel system and causing blockages.
- An underground control structure is located towards the bottom end of Crumplehorn car park. Its purpose is to allow normal river flows to continue down the existing river channel and through the centre of Polperro, but in times of flood, it is to divert the flow into the flood relief tunnel.
- The concrete lined tunnel is 1.2km in length and 3m diameter. It runs from the control structure in Crumplehorn car park to the outfall on the coastline at Swallow Cove. Its purpose is to carry the flood flows and discharge them directly into the sea 800m to the west of the harbour.
- To the west of the car park, there is a debris screen and control structure on the Langreek Stream. The purpose of this structure is to prevent blockages and divert flood flows away from the centre of Polperro and into the tunnel system.
- A second concrete lined tunnel 100m in length and 1.8m diameter carries flood flows from the Langreek Stream control structure and discharges into the main tunnel that outfalls at Swallow Cove.
- The tunnel outfall is located above high tide level. The precise position was selected to take into account the need to minimise environmental impact, to provide security against access and protection against the worst sea conditions.
- Work was also undertaken to increase the capacity at critical sections of the river channel through Polperro.



**Construction of the scheme**

The tunnel was designed by consulting engineers Scott Wilson Kirkpatrick, and the tunnelling work was carried out by contractors Thyssen Tunnelling Ltd of Pontefract who used a massive 46 ton tunnelling machine called a "Roadheader".

Construction of the huge, but vital, flood relief project began in July 1995 and was completed in November 1997 at a cost of £6 million.

**Promotion of the scheme**

The Environment Agency promoted the scheme after detailed consultations with local people, the planning authority and other statutory environmental consultees such as English Nature and English Heritage.

The scheme was approved by the South West Regional Flood Defence Committee and grant-aided by the Ministry of Agriculture, Fisheries and Food.



▲ The debris screen at the top end of Crumplehorn Car Park

Mining operations ▲  
inside the tunnel ▶



▲ The underground control structure in Crumplehorn Car Park



▲ The scheme in action: Floodwater discharging direct to the sea and out of harms way

**Success of the scheme**

Thanks to this 'tremendous feat of engineering' – words of Miss Jean Hubbard, District Councillor - Polperro residents have escaped flooding several times over the last few years.

The first time the scheme operated was on 27th November 1997, shortly after its completion. Without the new defences, there could have been similar devastation to that experienced in 1976 and 1993.

Since 1997, the scheme has also been successful several times, preventing minor and serious flooding - as in the case of the major storms in Autumn 2000.



▲ 'The final tunnel breakout is a historic moment in Westcountry engineering' said Julian James, Environment Agency Project Engineer