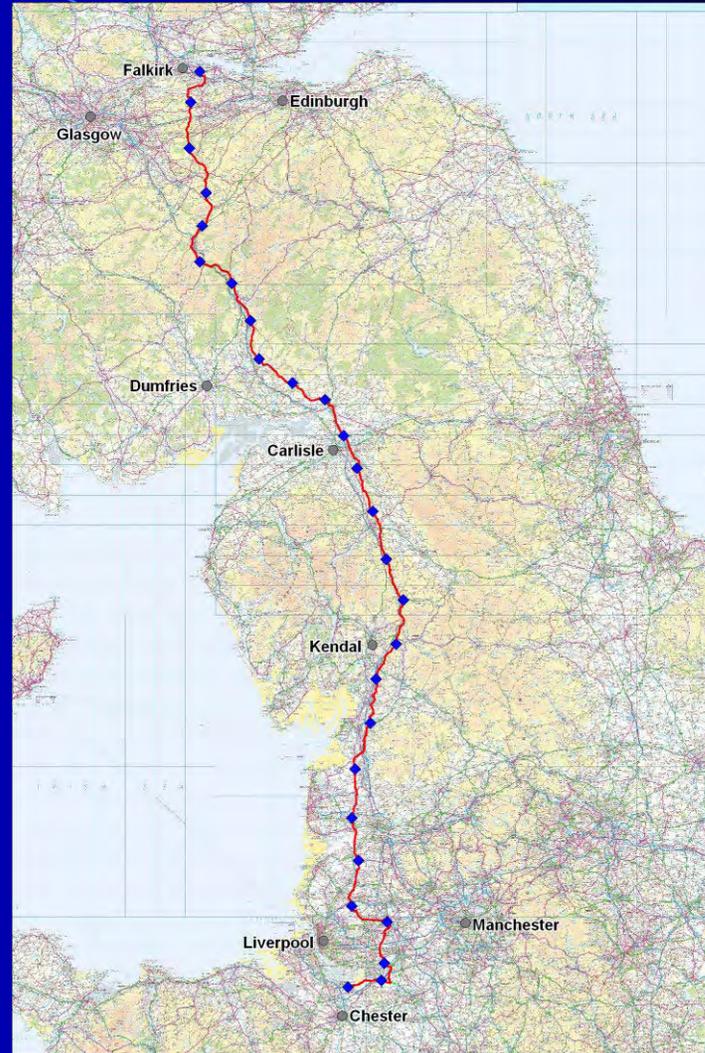
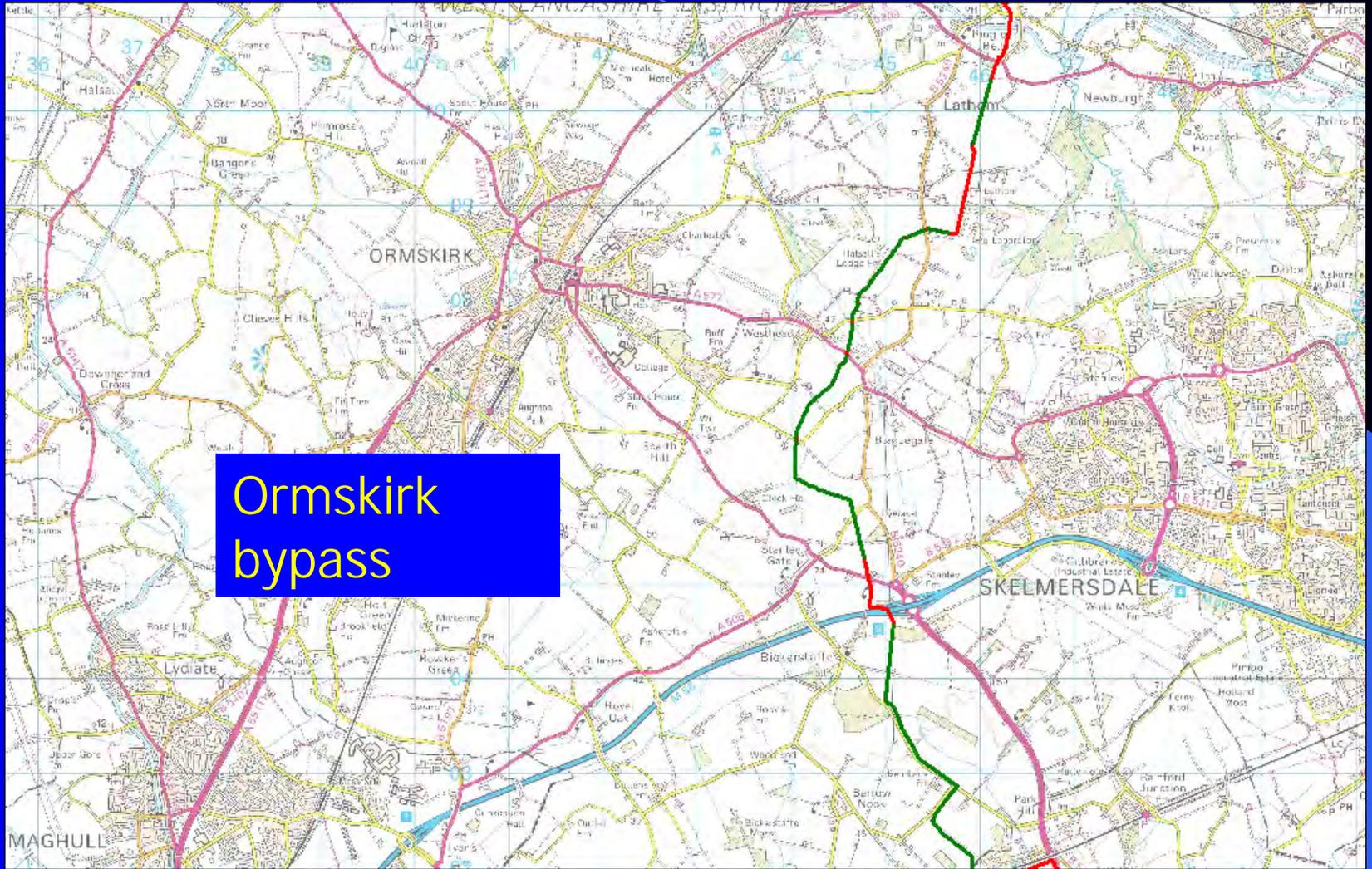


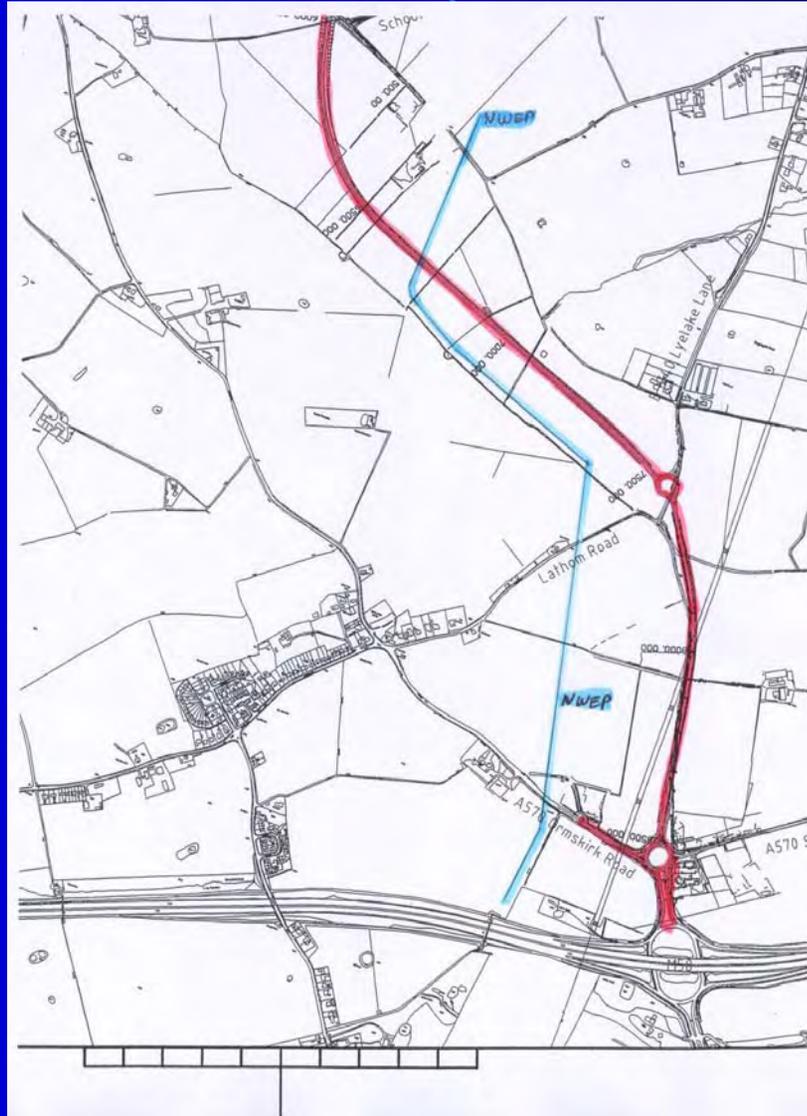
NW ethylene pipeline Ormskirk Bypass

The NW Ethylene pipeline





Ormskirk
bypass







Pipeline Construction 91-92

The Highways Agency DnV work 94-95

Route Selection

Alternatives considered

Scheme shelved

2004 scheme resurrected by Lancs CC

The new QRA and CBA

The Rod McConnell study 2004

- **1994 DNV study - provided basis for revised study**
- assumed risk reduction by only 56.5% for slabbing
- **PD 8010 code**

6.9.1.3 Category D and category E substances

Pipeline crossings of major roads should be carried out using either:

- a) pipe with a nominal wall thickness of 11.91 mm or greater without impact protection; or
- b) pipe with a wall thickness appropriate to the design factor and with impact protection in accordance with **6.9.7** (see also **E.9**).

Main hazards

- A. extra weight of road and traffic causing extra stresses**
- B. increased risk of 3rd party excavation rupturing pipe**

Good design of foundations and road crossing can eliminate A., so only risk is B. - B. Risk can be reduced by slabbing + marker tape

Re-run of DNV assessment using revised crack propagation risk, and 3rd party risk reduction of slabbing by 90% rather than 56.5% showed:-

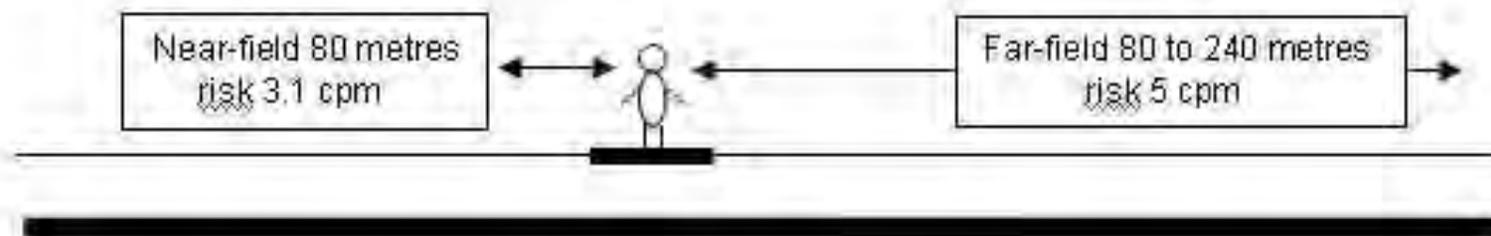
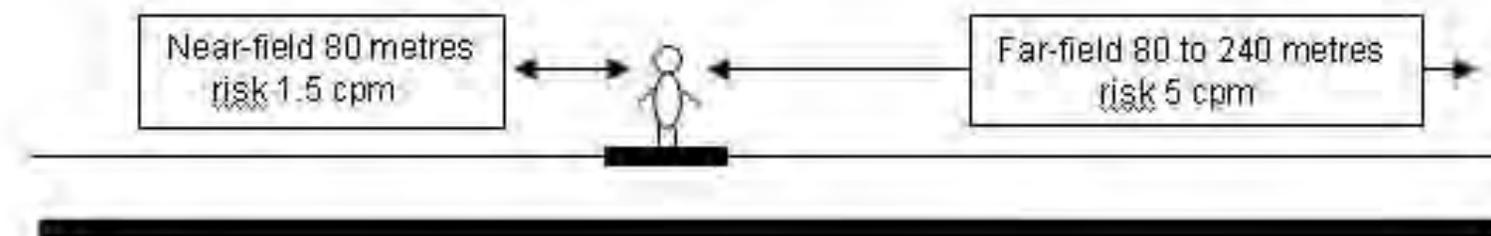
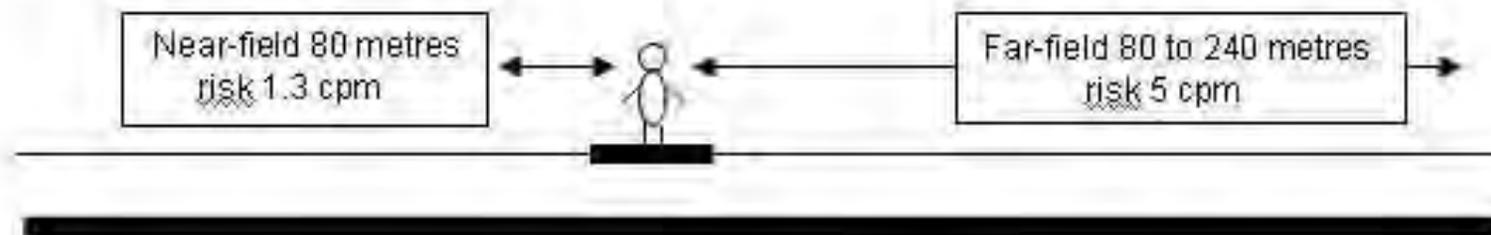
Overall Individual Risk reduction assuming pipeline 80 metres each side of road is protected as required by the Code:

Standard pipe, no protection 8.1×10^{-6} (100%)

Standard pipe, slabbing + marker tape 6.5×10^{-6} (81%)

Thick wall pipe 6.3×10^{-6} (78%)

- Most of the risk comes from outside the 80 metres effect distance (240 metres total effect distance)**
- BUT no increase in 3rd frequency assumed near the new road**

5.1 New Road, no protection**5.2 New Road, Slabbing and Marker Tape****5.3 New Road, Thick Wall Pipe or Sleeving**

Cost Benefit Analysis showed low justification for slabbing and even lower justification for re-lay

Safer to lay prepare area and lay concrete raft before main road construction starts

CONCLUSION

- **HAZARD IS 3RD PARTY EXCAVATION NEXT TO NEW ROAD**
- **SLABBING + MARKER TAPE IS ALMOST AS EFFECTIVE AT REDUCING RISK AS RE-LAY IN THICK-WALL PIPE**
- **THEREFORE RECOMMEND SLABBING + MARKER TAPE**