

Field Studies Council Research Centre
Fort Popton, Angle, Pembroke, Dyfed. SA71 5AD, U.K.

**A chronology of significant events
relevant to
'A Review of the Current State of
Environmental Knowledge of the
Milford Haven Waterway'**

*A report to to the
Milford Haven Waterway Environmental
Monitoring Steering Group*

edited by

G Hobbs and C I Morgan

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MILFORD HAVEN WATERWAY - CHRONOLOGY OF EVENTS

1940

- A direct hit on the fuel depot and storage tanks at Llanreath started the largest single fire of the second world war. Over 150,000 tonnes of oil were lost. There was significant atmospheric pollution with inputs to the waterway from this and the direct route.

1941

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1947

- Dale Fort Field Centre opened by the Council for the promotion of Field Studies (now the FSC).

1948

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1957

1958

- Ecological studies of rocky shores along Milford Haven begin with the establishment of a research fellowship at University College, Swansea.

1959

1960

- Completion of refinery by Esso Petroleum Company with a capacity of 8.7 million tonnes per year.
- Fire and explosion on m/v "Esso Portsmouth", the first tanker to discharge at the Esso refinery, with the loss of approximately 700 tonnes of oil, an estimated 300 tonnes spilling into the haven.

1961

- BP opened an ocean terminal at Angle Bay with a capacity of 9.2 million tonnes per year.

1962

- Slight pollution occurred when the m/v "Benjamin Coates" ran aground on mid-channel rocks.

1963

- Moyse and Nelson-Smith establish 30 belt transects within Milford Haven in order to describe the distribution of common littoral plants and animals.

1964

- Regent (later Texaco) refinery at Rhoscrowther commissioned.

1965**1966****1967**

- M/v 'Chryssi P Goulandris' entered Milford Haven after suffering extensive damage at sea; 250 tonnes of oil spilled.
- Formation of the Oil Pollution Research Unit of the Field Studies Council at Orielton Field Centre, Pembroke. Funding and resources provided by Field Studies Council, Institute of Petroleum and World Wide Fund for Nature.

1968

- Gulf oil refinery commissioned.
- A tank overflow from the Gulf refinery released 100 tonnes of crude oil into the waterway.
- OPRU (Crapp) carries out the second major survey of shores within the Haven, using sites and methods employed by Moyse and Nelson-Smith with additional sites to study the effects of discharges and particular oil spills. These studies effectively established the baseline for all subsequent work.

1969

- CEGB initiate pre- and post-commissioning studies of temperature regime and animal and plant communities across Pwllcrochan Flats with regard to the power station cooling water discharge (Spencer and Coughlan).

1970

- Pembroke Power Station commissioned. Effluent discharge to the waterway approximately 1 million gallons per day, containing around 10 parts per million of oil mixed into the cooling water flow of 300 million gallons per day.
- OPRU (Crapp) estimates that the three refineries contribute 270,000 litres of oil per year to the Haven.

1971

- M/v 'Thuntank 6' ran aground just northwest of Thorn Island spilling 150 tonnes of light fuel oil.
- Permitted level of discharge of oil in effluent reduced from 50 mg/l to 25 mg/l by the Welsh Water Authority.

1972

- OPRU resurvey of selected rocky shore monitoring transects. Funded by the Institute of Petroleum.
- A tank over flow at BP Angle Bay of 13,000 tonnes of crude oil causes soil and groundwater contamination. Some oil ends up on the foreshore at Kilpaison, the result of run-off and groundwater flow.

1973

- Amoco refinery commissioned with a capacity of 5 million tonnes per year.
- M/v 'Dona Marika' drifted ashore releasing 2300 tonnes of petrol into the waterway at Lindsay Bay.
- OPRU resurvey of selected rocky shore monitoring transects.

1974

- OPRU resurvey of selected rocky shore monitoring transects.
- First OPRU survey of communities of sub-littoral sediments; 25 stations sampled (Addy).

1975

- OPRU studies on the effects of crude oil and dispersants on intertidal sediment communities (lugworms) at Sandyhaven (Levell).

1976

- OPRU resurvey of selected rocky shore monitoring transects.

1977

- OPRU resurvey of selected rocky shore monitoring transects.

1978

- OPRU resurvey of selected rocky shore monitoring transects.
- Total refining capacity of the four refineries operating along Milford Haven estimated as 30 million tonnes per annum out of a UK total of 150 million tonnes per annum (Pauluis, 1979).

1979

- OPRU (Little A E) completes a major resurvey of 21 of the transects studied by Crapp and compares the results to work carried out over the previous 16 years.
- OPRU (Hiscock) describes a bed of Zostera marina running parallel to the shore opposite the Esso refinery effluent discharge point in Littlewick Bay.
- Studies on the impact of oils and dispersants on intertidal sea grass beds at Angle Bay (Holden and Baker).

1980

- OPRU (Hiscock) tests a photographic monitoring technique on the communities of jetty piles adjacent to the Amoco effluent discharge.

1981

- Amoco commissions a catalytic cracking unit with major up-grade to waste water treatment plant.

1982

- Pembroke Cracking Company (Texaco-Gulf) commission a catalytic cracking unit with major up-grade to waste water treatment plant.
- OPRU resurveys 19 rocky shore monitoring sites within the waterway, the last occasion that regular rocky shore monitoring took place. Funded by the Institute of Petroleum.
- OPRU find elevated levels of fresh and weathered oil (5-480 microgrammes /g) in intertidal and subtidal sediments (Dicks and Hartley, 1982).

- OPRU (Abbiss) estimates that the four refineries contribute 200,000 litres of oil per year to the Haven with a further 70,000 litres contributed by other sources (Dicks and Hartley, 1982).
- Second OPRU survey of communities of sub-littoral sediments; 155 stations sampled (Rostron).

1983

- Esso refinery closes.
- Start of OPRU studies on the environmental effects of Esso closure on littoral communities which had been affected by the refinery effluent stream into Littlewick Bay (Dicks).
- Survey of *Spartina* die-back (Wilson).

1984

- Chemical vis-breaker commissioned at the Texaco refinery.
- OPRU preliminary intertidal surveys of the Upper Cleddau (Morris).
- OPRU resurvey of Milford Haven sediments (Rostron).

1985

- BP Angle Bay Ocean terminal decommissioned.

1986

1987

- Completion of OPRU studies on the environmental effects of Esso closure on littoral communities which had been affected by the refinery effluent stream into Littlewick Bay (Dicks).

1988

- Oil Pollution Research Unit relocated at FSC Research Centre, Fort Popton.
- FSC Research Centre completes a study of the fish farming capability of Milford Haven.
- M/v 'El Omar' spills 100 tonnes of Iranian crude oil while unloading at the Texaco jetty.

1989

- M/v 'Texaco Westminster' spills about 80 tonnes of fuel oil into the waterway, contaminating shores from Chapel Bay to Thorn Island.

1990

1991

- Dyfed County Council one day conference on pollution in Milford Haven Waterway.
- Establishment of the Milford Haven Waterway Environmental Monitoring Steering Group.

1992

- Major dredging of the 'box' at the Gulf jetty.

1993

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