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Project Purley

Document PURL-0000-X0LZ-0001

Summary

An article written as part of the account of Purley on Thames describing the Aldermaston Pipeline and its impact upon Purley

THE ALDERMASTON PIPELINE

The Atomic Weapons Research Establishment

During World War Two there was an airfield at Aldermaston. This was used as the site for the development of British Nuclear weapons when the War ended with the explosion of the two American bombs at Hiroshima and Nagasaki. These had been developed with the active participation of a number of British scientists who had in fact begun the research as part of the 'Tube Alloys' project at Birmingham University.

The airfield at Harwell had already been taken over to be used for civilian research but a second site nearby where the military developments could take place was deemed essential and the airfield at Aldermaston was selected. This was quite close to the site of the first British nuclear reactor which had been located at Aldermaston Court. The reactor hall remained there until quite recently when Blue Circle redeveloped the Manor House and its grounds for their national headquarters.

The Atomic Weapons Research Establishment (AWRE), as it became known, was established in 194x under its first Director William (later Sir William) Penny. It was responsible for the design and development of all British Nuclear weapons which were constructed at the nearby Royal Ordnance factory at Burghfield. Many workers and scientists were transferred into the area from the Royal Arsenal at Woolwich. An estate was built for them at Calcot but many preferred to find their own accommodation and a number settled in Purley

The establishment was renamed Atomic Weapons Establishment (AWE) in 1987

The Pipeline

The disposal of waste products from the establishment was always a matter for concern and great care was taken to ensure that it was disposed of safely. One of the waste

products was contaminated water. After a great deal of heart-searching it was finally decided to build a pipeline to take it from Aldermaston to discharge in the River Thames.

In January 1951 Purley Parish Council were informed that this pipeline would run into the Thames at the Sul Brook. There would be eleven miles of pipe of between 5 and 3 inches diameter which would discharge about 25,000 galls daily into the Thames.

The pipeline enters the area running alongside the A340 from Theale to Pangbourne. Just after it goes beneath the M4 motorway it swings north east to cross the Sulham to Tidmarsh road. It then heads due north to cross Sulham Lane just after the latter enters Purley from the south. It runs to the east of Sulham Lane and the Sul Brook crossing under the railway near the sewage works. From there it veers slightly more to the north east and drains into the Thames about 100 yards to the east of the bridge over the Sul Brook.

Although most official records refer to it as discharging at Pangbourne it does not enter the Parish of Pangbourne at all but runs through Theale, Englefield, Tidmarsh, Sulham and discharges at Purley.

The Controversies

The pipeline operated successfully for many years without any serious problems or complaints. The rise of protest about all things nuclear reached a peak at the time of the introduction of Cruise missiles at Greenham Common in the late 1970s and a lot of very ill informed press coverage was given to the pipeline.

Many people were put into a state of near hysteria, having been persuaded by the media that the whole area was being polluted and everyone was being turned into either a zombie or at best a cancer victim. The reassurances of local councillors and the safety officers at Aldermaston had very little effect. It was very difficult to persuade people about a topic of which they knew nothing. The reports in the paper have been repeated every few years as a new reporter for a local paper found out about it and thought it would be a good story.

The controversies reached another peak in January 1966 after a television programme put out by Yorkshire Television which purported to prove that children living in the area suffered an abnormal rate of childhood cancers. They were unable to supply the so called evidence upon which the claim was based but an enquiry was called for by the County Council which was conducted by the Commission for Medical Aspects of Radiation in the Environment (COMARE)

In order to reassure themselves Purley Parish Council visited AWRE in 1986 where they were told about the procedures for discharging and the safety precautions that were taken. By and large everyone was satisfied with the assurances given. Before the visit one of the Councillors, John Southall, produced a detailed paper entitled 'A Nuclear Environment' which gave a lot of background information.

A more serious problem occurred in December 1987 when a valve was left open at Ufton Nervet and effluent flooded a field, while a section of the pipeline was being maintained. The pipeline has twin pipes which run alongside each other so that when one is being maintained the other can be used for discharging. This means that every so often there is a set of valves which switch effluent from one pipe to the other. One of the valves was left in the wrong position and effluent flooded the manhole and overflowed into ditches. About 4000 galls was released. When it was realised what happened the valves were closed and the water pumped out of all the neighbouring ditches. Newbury District Council took samples of water, soil and vegetation which has been sent to the National Radiological Protection Board at Harwell for analysis.

The Effluent

The effluent that is discharged down the pipe comes from water used in various activities at the establishment, eg in showers and to wash surfaces. This water is drained into a storage tank and treated to deposit minerals. After treatment it is allowed to drain into a second tank and allowed to settle again. It goes into a third tank and after sampling is allowed to flow into the pipe down to Purley. Each batch contains around 3-4000 galls.

It is difficult to define what radioactive substances remain after treatment as the processes are so varied and the volumes so minute. Basically they fall into two categories, first the radioactive chemicals which may be in the form of suspended

solids or held in solution. They may contain elements like Plutonium or Uranium or radio-isotopes of more common elements like Iodine or Strontium. These like all radioactive materials will emit either or both alpha or beta radiation. The second group are those that contain the isotope of Hydrogen known as Tritium. This is of course mainly water and it is virtually impossible to separate tritiated water from the normal variety. Thus whereas the first group of alpha and beta emitters can to a certain extent be removed, the tritiated material has to be allowed to decay naturally. Tritium has a half life of 12.5 years and so very little of it will decay while in the settling tanks.

Monitoring

Each year the Environmental Monitoring Group at AWRE produce a report on the results of tests carried out on samples taken in the area. These measure:-

- The volume discharged
- The level of alpha activity
- The level of beta activity (not tritiated)
- The level of beta activity in tritiated materials

The agreed safety levels refer to total discharges into the Thames and cover the route via public sewers and the River Kennet as well as the pipeline to Purley. In some years the reports have been for the two added together.

The results have been:-

Year	volume	alpha	beta	tritiated	alpha	tritiated
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					plus beta	
	cu m	MBq	MBq	GBq	GBq	GBq
<i>agreed limit</i>					5800	5800
1976					428	170
1977					402	112
1978					138	79
1979					143	51
1980					160	84
1981					<150	100
1982	19000	200	300	400	<150	900
1983					<100	80
1984	16000	100	250	100	<80	100
1985	15000	80	200	200	<80	200
1986					150	
1987	14100	120	220	60	100	
1988						
1989						
1990						
1991						

The unit of measurement of radioactivity is the Becquerel. The last two columns refer to the total emission into the Thames whereas the middle four refer just to Purley Note that a very small amount is fed to the Thames via the Kennet.

For comparison in 1985 a survey was made of radioactivity in spa water sold in local shops. Seventeen samples were purchased and subjected to the same analyses as is used for the samples taken: from the River Thames.

No of Samples	Alpha activity range
	Bq / Cum
6	2-30
6	30-60
3	60-100
1	140
1	1900
Average surface water in area	15
1985 discharge	5
WHO drinking water guideline	100

A more detailed survey' was undertaken in 1984 which looked at. soil and sediment samples near to the outfall. They started at the outfall and took samples at 50, 100, 150 &

200 metres upstream and 10, 20, 50, 100, 200, 300 & 400 metres downstream. Inland samples were also taken at 100 metres upstream, opposite the outfall and 125 & 250 m downstream. The findings were that no pattern could be detected and that all the samples were consistent both in amount and distribution of isotopes with the general natural pattern for this part of Southern England. Any plutonium discovered was below the average level expected from fall out from atmospheric testing of nuclear weapons. Unexpectedly the inland samples had a slightly higher Plutonium content than the riverbank samples although the Uranium contents were virtually identical.

The end of the Pipeline

Bibliography

Evening Post (Reading)

Minutes and Reports of Newbury District Council

Annual reports of Environmental Monitoring published by AWRE