

2. EVALUATION OF THE VERIFICATION PROCEDURE

1. Materials

Rhine river water samples were collected from the Lek at Bergambacht and analysed by the Dune Water Works of the Hague. The Meuse river was sampled at Keizerzveer and analysed by the Drinking Water Works of Rotterdam. The samples were stored in a refrigerating room. The chemical analyses of the water samples are listed in Table 1.

Table 1 Chemical analyses of Rhine and Meuse river samples								
component	Rhine						Meuse	
	12-12-'73	12-8-'74	20-11-'74	8-1-'75	25-8-'75	3-3-'76	23-2-'76	
chloride (mg/l)	230	175	163	83	140	196	37	
sulphate "	89	86	85	59	70	94	54	
bicarbonate "	140	146	156	146	149	193	134	
nitrate "	11.5	10.8	12.2	14.0	12.7	17.6	17.0	
Kjeldahl nitrogen "	4.4	1.7	2.2	1.5	1.0	2.6	1.9	
orthophosphate "	0.62	0.55	0.75	0.41	0.98	0.97	0.73	
unfiltered "	1.95	1.27	1.70	1.10	1.61	1.92	1.4	
total organic carbon "	6.2	7.8	5.9	8.0	5.5	8.2	6.9	
silt "	64	10	19	46	33	23	26	
cholinesterase inhibition in parathion eq. (µg/l)	0.17	0.25	0.24	0.04	0.08	0.13	-	
H flow (m ³ /sec)	7.55	7.60	7.50	7.65	7.70	7.50	7.6	
	2572*	1648*	2870*	3497*	1964*	1329*	350**	

* Lobith.
** Lith.

For each experiment new glassware was used to preclude cross-contamination.

³²P-labelled methylphosphonic acid (specific activity 1 mCi/g) and ³²P-labelled VX (specific activity 20 mCi/g) as well as the corresponding unlabelled compounds were synthesized in this laboratory. Diazomethane was prepared and used in diethyl ether solution⁽⁷⁾.

2.2. Hydrolysis

As stated in Chapter 1 gas chromatography in combination with a specific phosphorus detection is a suitable technique for the tracing of nerve agents in water at very low concentrations. To make the gas chromatographic picture as simple as possible (section 2.6) a complete hydrolysis should be carried out after which most