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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

PC Code: 123000
DPBarcode: D278264

SUBJECT: Isoxaflutole Tile Drain Studies, Allen and Owen Counties, Indiana

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DATE: February 14, 2002

This memorandum provides EFED's review of two field studies conducted in 2000 (MRID 454984-01, -02). These studies included the automated sampling and analysis of water samples from tile drain systems, and ditches and streams downstream from two corn fields in Allen and Owen counties, Indiana.

These studies differed from previous tile drain studies for isoxaflutole in that the sampling was automated, rather than manual, allowing many more samples to be collected at much shorter intervals. Samples were collected every 80 minutes while the tile drains were flowing, and daily otherwise (previous studies had only daily sampling). The purpose of this frequent sampling was to record peak concentrations that might be missed if samples were taken less frequently (e.g., daily). Soil samples were also taken to measure the dissipation of isoxaflutole from the experimental fields.

The results of the studies are presented in the attached graphs. There are four (4) graphs for each site: two automated samplers, the ditch that received the tile drain flow, and the stream into which the ditch emptied. The stream in Allen county was Maumee River, and in Owen county it was the west branch of the White River. Please note that where samples were reported as "nd" for "not detected" or "to be analyzed", a value of 0 ppb was assigned for that data point.

As in previous studies, the concentrations of isoxaflutole and the first degradation product

(RPA202248) were closely correlated with rainfall amounts and tile drain flow amounts. The highest concentrations were observed after the first rainfall, with decreasing amounts seen after subsequent rain events. The maximum concentrations observed in the tile drain water were between 20 and 70 parts-per-billion (20,000 to 70,000 parts-per-trillion). Later rains produced peak concentrations of 5 to 40 ppb.

Please note that the peak concentrations recorded in these field trials are indeed quite a bit higher than observed in other tile drain studies (see memo for DP Barcode 273604), as expected from the more-frequent sampling. The highest peak concentrations previously observed in tile drain water were below 5 ppb.

The concentrations measured in the ditch samples were 0.1 to 1.0 ppb. The stream samples had concentrations ranging from one-fourth of the ditch concentrations, to about equal that seen in the ditch (i.e., no apparent dilution). The latter observation was attributed to use of isoxaflutole elsewhere in the watershed. Both the dilution in receiving waters and the observation of chemical coming from upstream are consistent with previous studies.

Dissipation half-lives in the soil, calculated by first-order regression of natural-log transformed concentration data, were 35 days for Allen county and 26 days for Owen county. These are also consistent with previous studies where there was adequate rainfall.

Figure 1: Allen County, IN Sampler 1

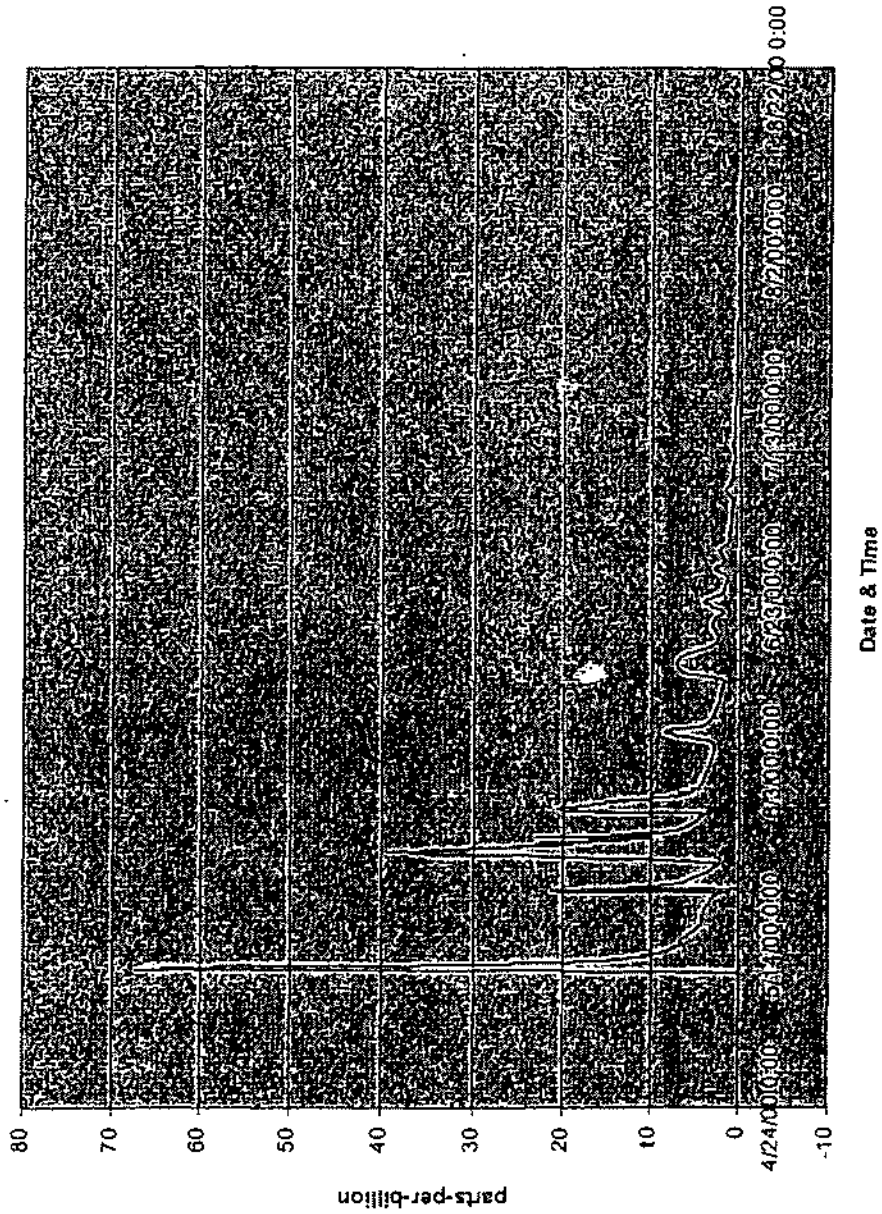


Figure 2: Allen County, IN Sampler 2

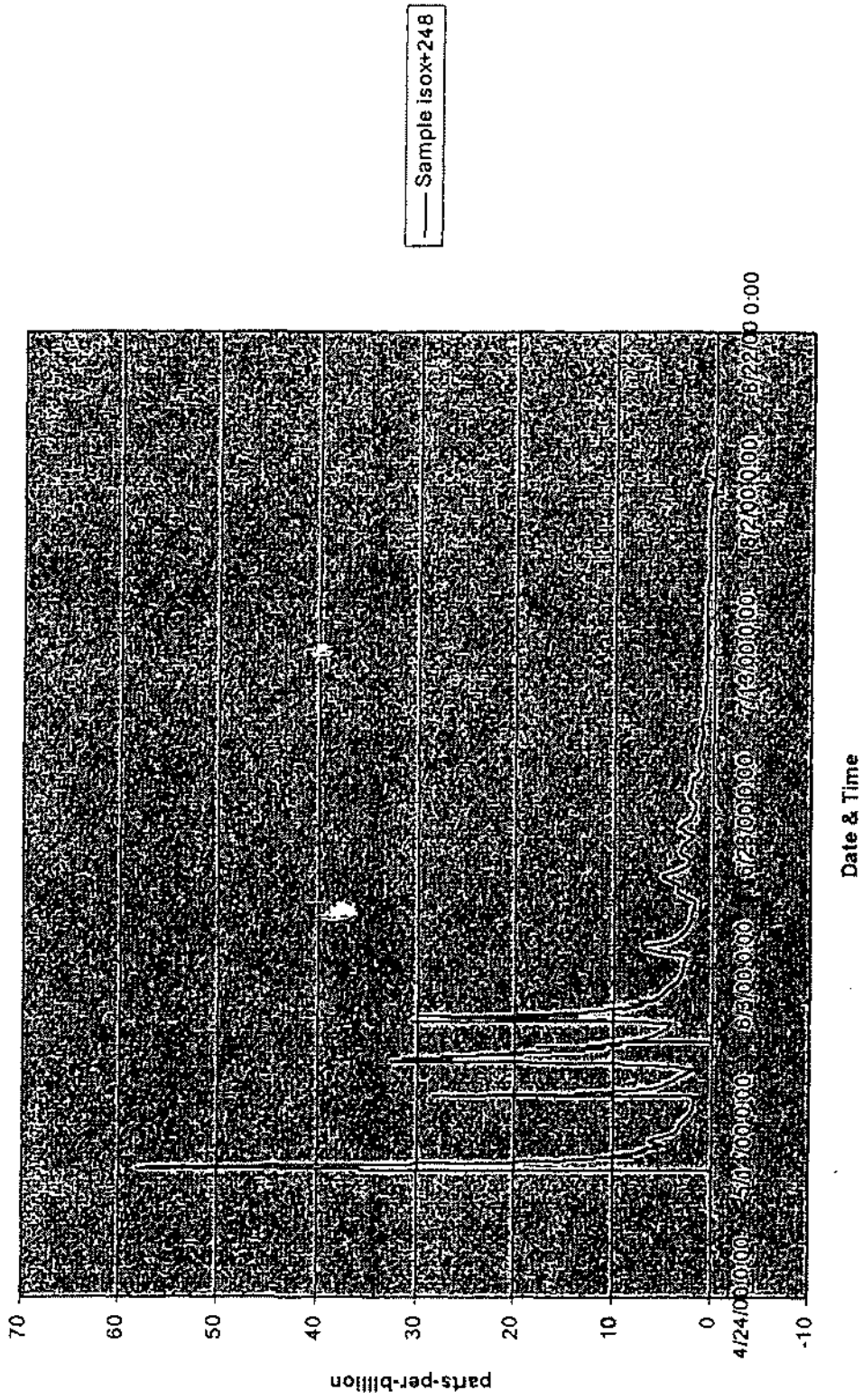


Figure 3: Allen Co. Ditch Water (preliminary)

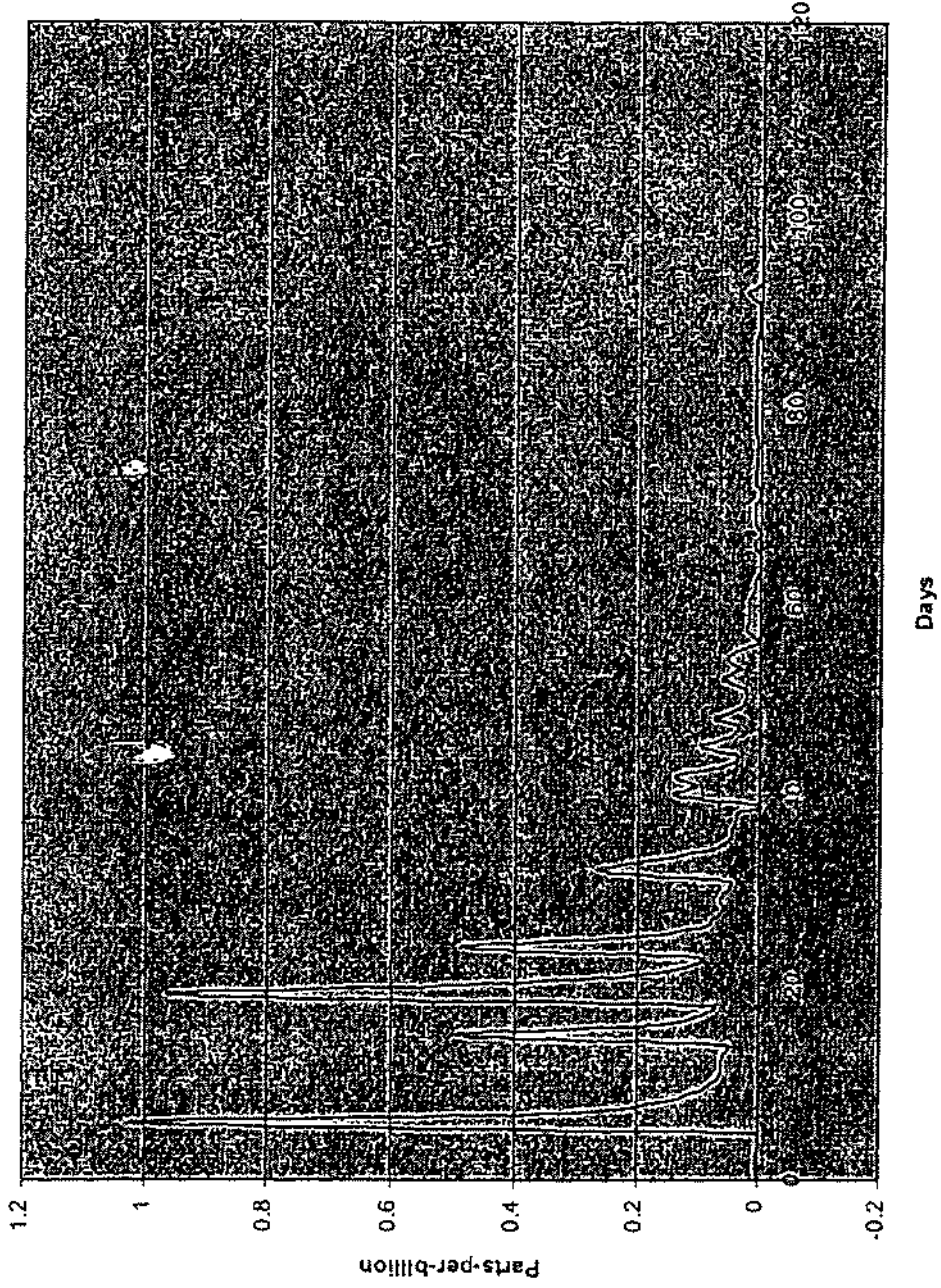
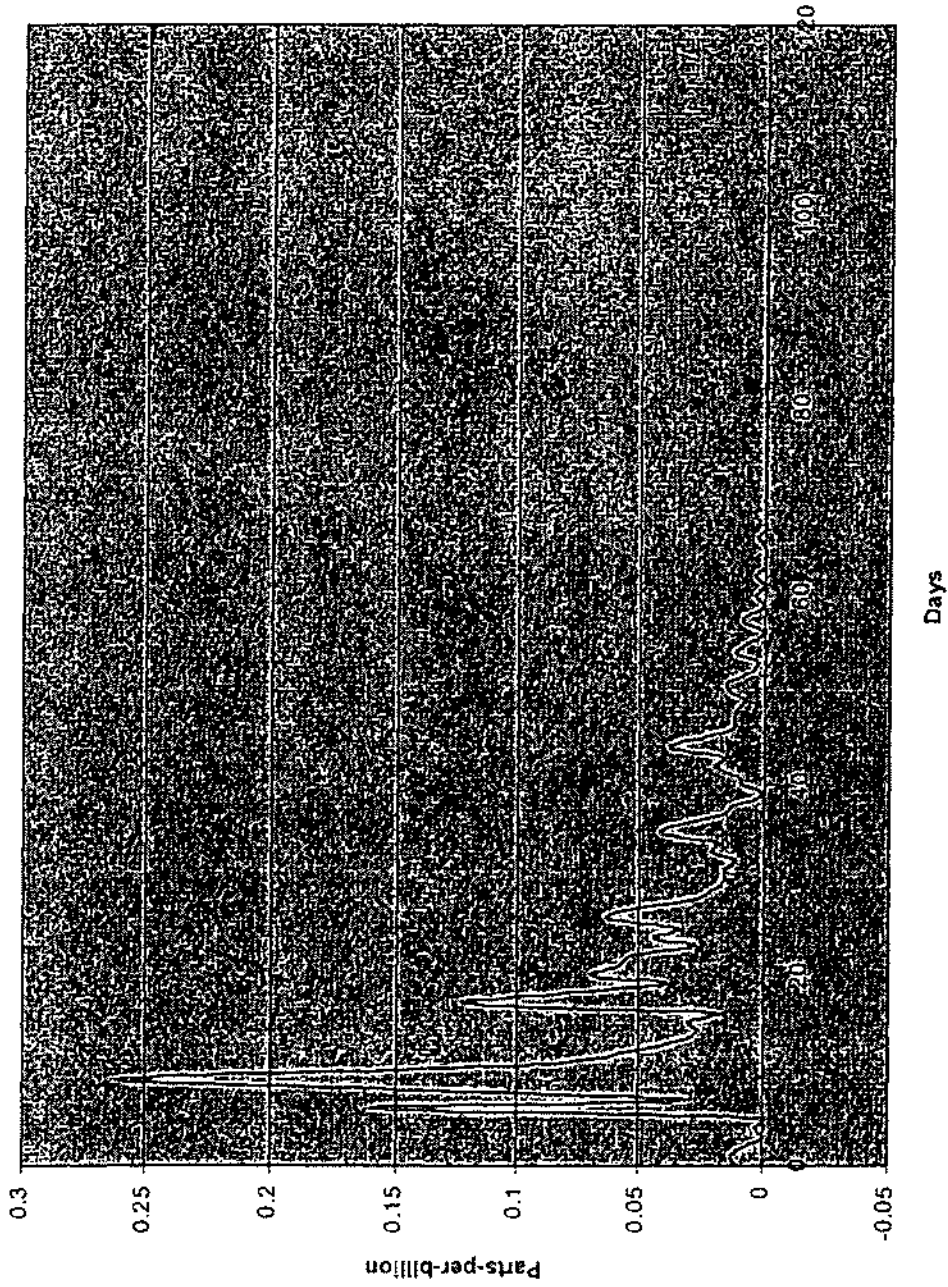
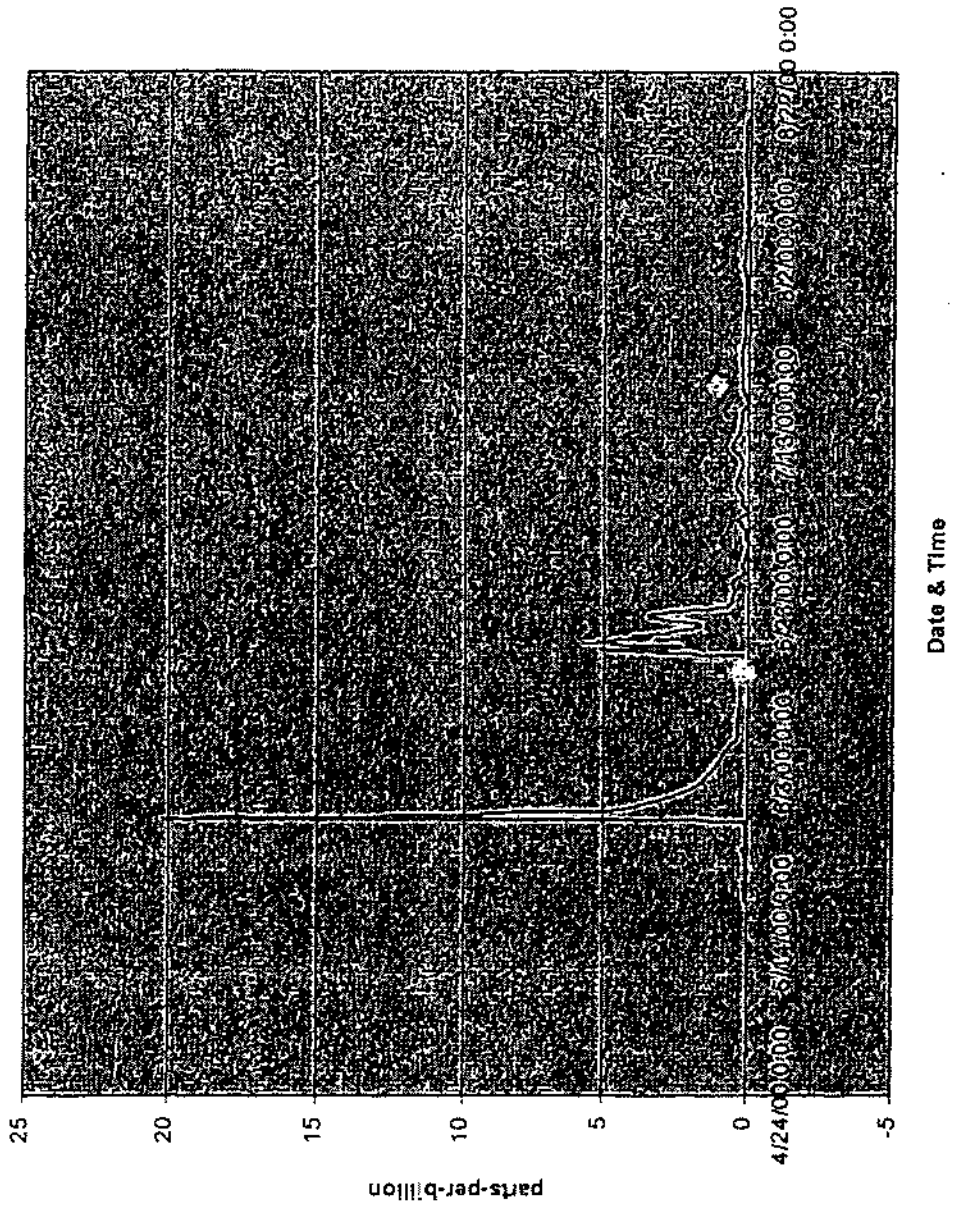


Figure 4: Allen Co. IN Stream Water (preliminary)



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Figure 6: Owen County IN Sampler 2



— Sample Isox+202248

Figure 7: Owen County IN Ditch water (preliminary)

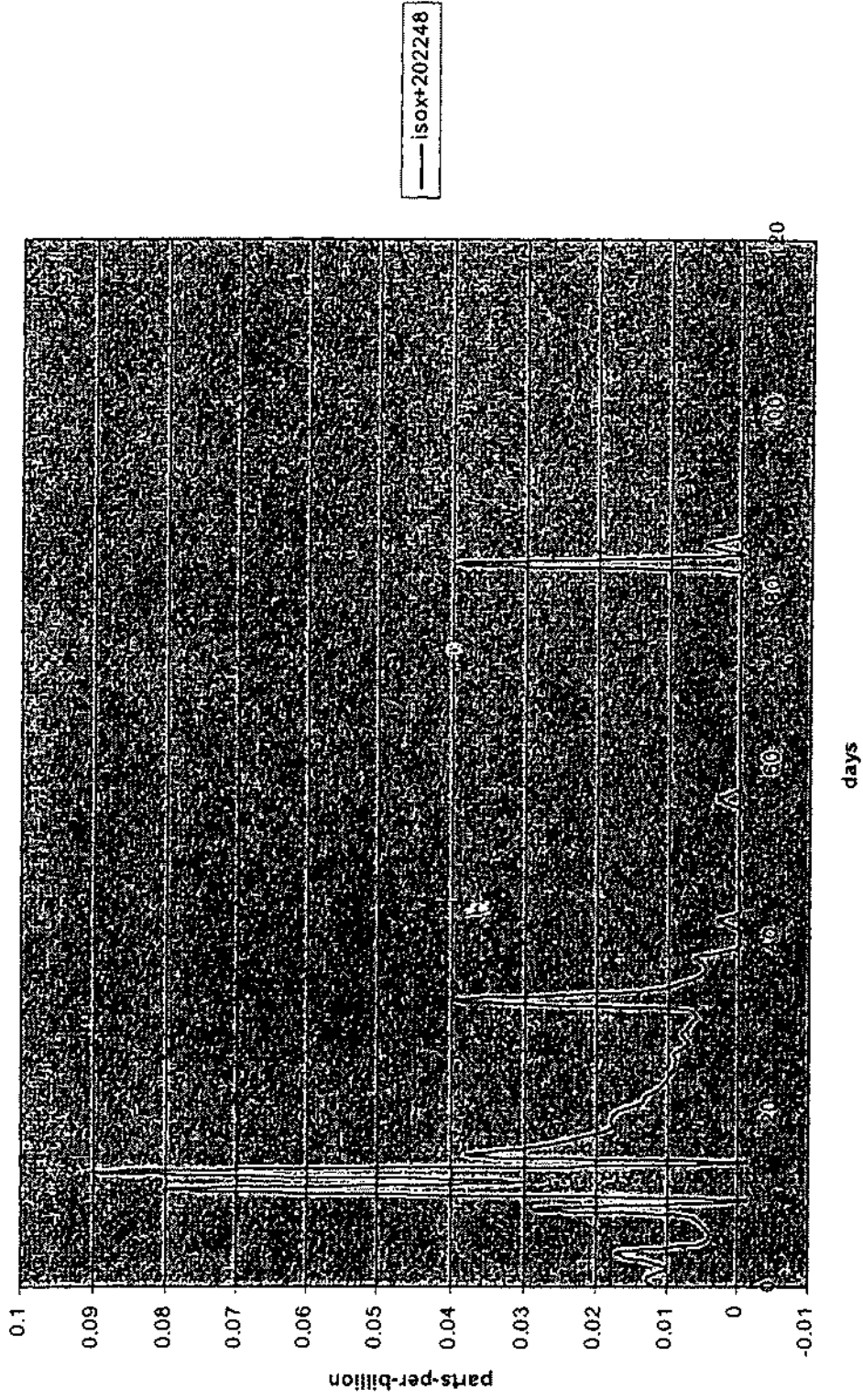


Figure 8: Owen Co. IN Stream water

