

Du Pont de Nemours (Nederland) BV
Dordrecht Works

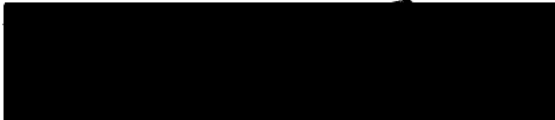
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From:



Dordrecht, 19-4-1994

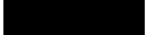
C8 IN GROUNDWATER SAMPLES ON DORDRECHT WORKS SITE
SAMPLES OF FEBRUARY 1994

BACKGROUND

As a part of the ongoing program to reduce the potential exposure of the community to C-8, it was decided to measure C-8 concentrations in groundwater wells on the site. This had been done in 1993, results have been reported before, and are repeated in the table below, column "C8 '93", and on map 1. The 1993 numbers were all below 3 ppb and no C-8 was found in the deeper aquifers.

The sampling program was repeated in February 1994. This time in total 14 samples were taken, all from water wells with the filter in the middle of the first aquifer. See table 1 and maps for results.

CONCLUSIONS

1. For the few points where we have data on both 1993 and 1994, we see similar or higher numbers in 1994. The increase is probably not statistically significant
2. The highest number found was 28 ppb, in a well close to the Romney Hut. Past samples of the upper sand layer in that area showed numbers of up to 230 ppb. The groundwater flow in the upper layer is towards the river, and the 230 ppb by itself was no reason to worry. However, the 28 ppb in the first aquifer shows that the vertical transport of C-8 in the ground is considerable.
3. One of the two second-highest concentrations (13 ppb) was found near the PPD-I building. This can be explained by the fact that all the groundwater streams (except the upper sand layer) are roughly in the direction South-West so the source was somewhere in Teflon or Viton/FEP, as expected.
4. The concentration variations in the horizontal plain do not show a clear profile or trend. It was attempted to explain this by the exact vertical position of the filters in the wells, but I was not able to make a consistent explanation. It is clear, however, that the bottom under our site is far from homogeneous, and local variations in bottom composition may account for irregular behaviour of sample results. This will be discussed in more details with  the groundwater specialist.

RECOMMENDATIONS

Groundwater contamination is very hard to control. Although the current drinking water wells are in the fourth aquifer, and no C-8 has been detected there, there is a risk that long-term the C-8 will reach the fourth aquifer. This may have serious legal and/or liability consequences. The program to reduce the risks follows two tracks:

1. CONTROL SOURCES.

Various situations with large potential spills to the ground have been identified, and need to be fixed. The most conspicuous ones are:

- a. breaking sewer pipes under the Viton/FEP building
- b. overflowing sewer near Teflon wax trap
- c. old uncontrolled dumping sites for Teflon waste

I will come with proposals for item a and b, item c will be discussed in the June International C-8 meeting.

For the rest it is a matter of discipline and care. Everyone should know that no drop of C-8 should be spilled to the soil, and all C-8 should end-up in the process sewer, where it may be removed if needed.

If there are potential spill situations, spill control should be provided. This can be done with relatively small investment.

2. REMOVE PRESENT C-8 FROM GROUNDWATER

The project for containment/remediation of chlorocarbons contaminated groundwater contains a step where the water is led over a carbon contactor, before it is discharged to the river. All data indicate that this step will also remove any C-8. We will confirm this mid 1994 by taking samples before and after the treatment step. It is proposed to make C-8 control an integral routine part of the operation.

RESULTS

The results are shown in table 1, column "C8 '94", and on map 2. The columns in this table show viz.: LOCATION_ID, EAST COORDINATE, NORTH COORDINATE, AQUIFERCODE, C-8 1994, C-8 1993, AND LOCATION DESCRIPTION. These codes correspond with the official reports by the DELFT GRONDMECHANICA company, as a part of the project to remove chlorocarbons from the groundwater.

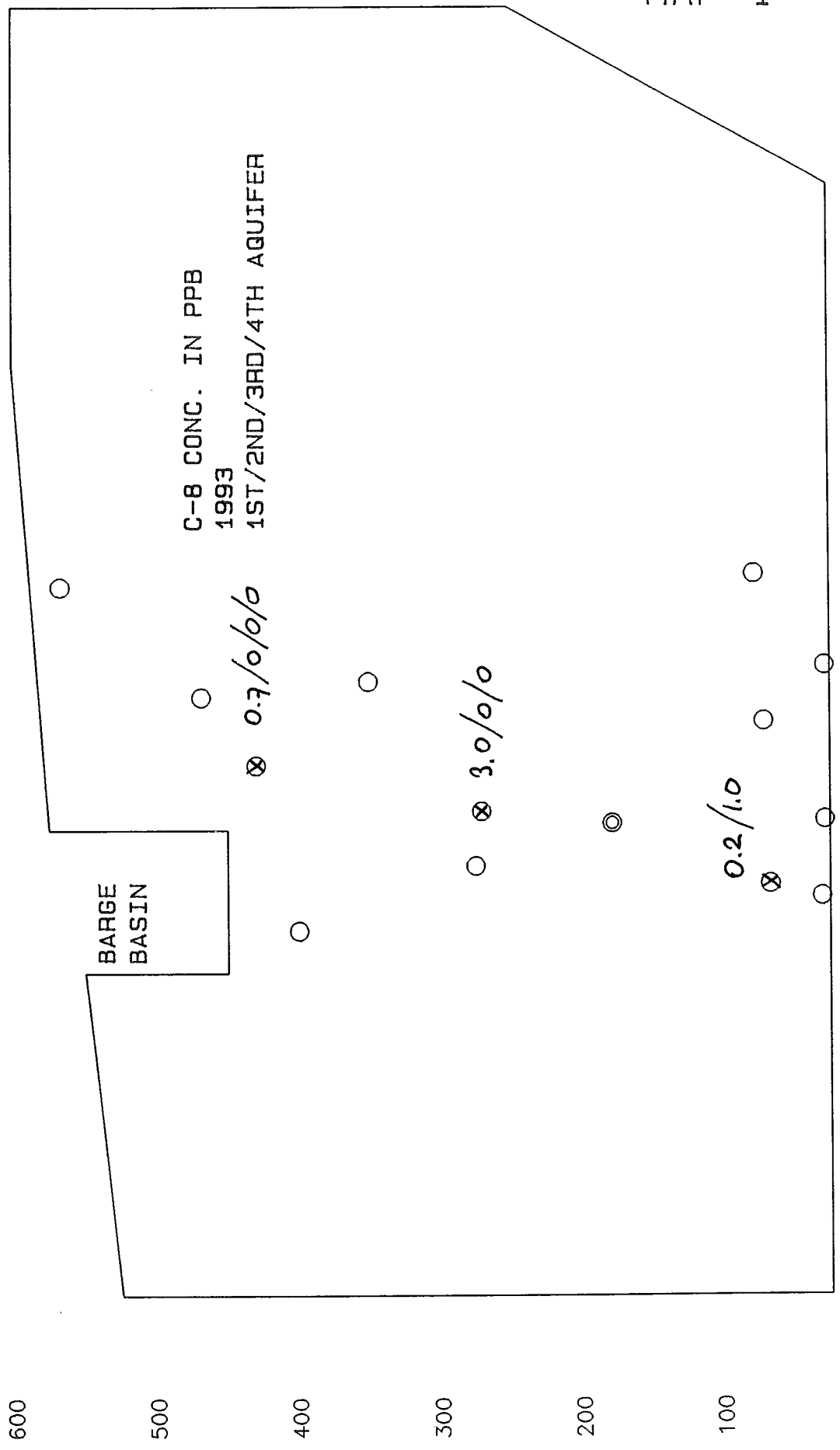
table 1

LOC_ID	EAST	NORTH	AQFER	C8 '94 [PPB]	C8 '93 [PPB]	LOCATION
N-08-1M	1930	20	1M	0.5		Baanhoekweg
N-09-2	2040	20	1M	13		Baanhoekweg
N-13-1M	2000	70	1M	11		Centr. W.house SW
N-17-1	2010	470	1M	13		PPD-1 Oost
N-18-1	1900	280	1M	0		Delrin off.
N-19-1	2030	350	1M	0.4		Delrin Chem
N-20-1M	1930	180	1M	0.4		Works Eng. SW
N-21-1	1860	400	1M	0.2		Delrin furn
W-2-A	2103	84	1M	3.9		Centr. W.house SE
W-3-A	1890	68	1M	0.7	0.2	Lycra South
W-3-B	1890	68	1D		1	Lycra South
W-5-A	2097	668	1M	28		Romney Hut
W-6-A	1969	426	1M		0.7	PPD-1 Zuid
W-6-B	1969	426	1D	0	0	PPD-1 Zuid
W-6-C	1969	426	2M		0	PPD-1 Zuid
W-6-D	1969	426	2D		0	PPD-1 Zuid
W-8-A	1944	275	1M		3	grndwtr bldg
W-8-B	1944	275	1D	0.6	0	grndwtr bldg
W-8-C	1944	275	2M		0	grndwtr bldg
W-9-A	1880	23	1M	0.2		Baanhoekweg

1600 1700 1800 1900 2000 2100 2200 2300 2400

GROUNDWATER WELLS AT DUPONT SITE

MAP 1



BAANHOEKWEG

BARGE BASIN

C-8 CONC. IN PPB
1993
1ST/2ND/3RD/4TH AQUIFER

⊗ 0.7/0/0/0

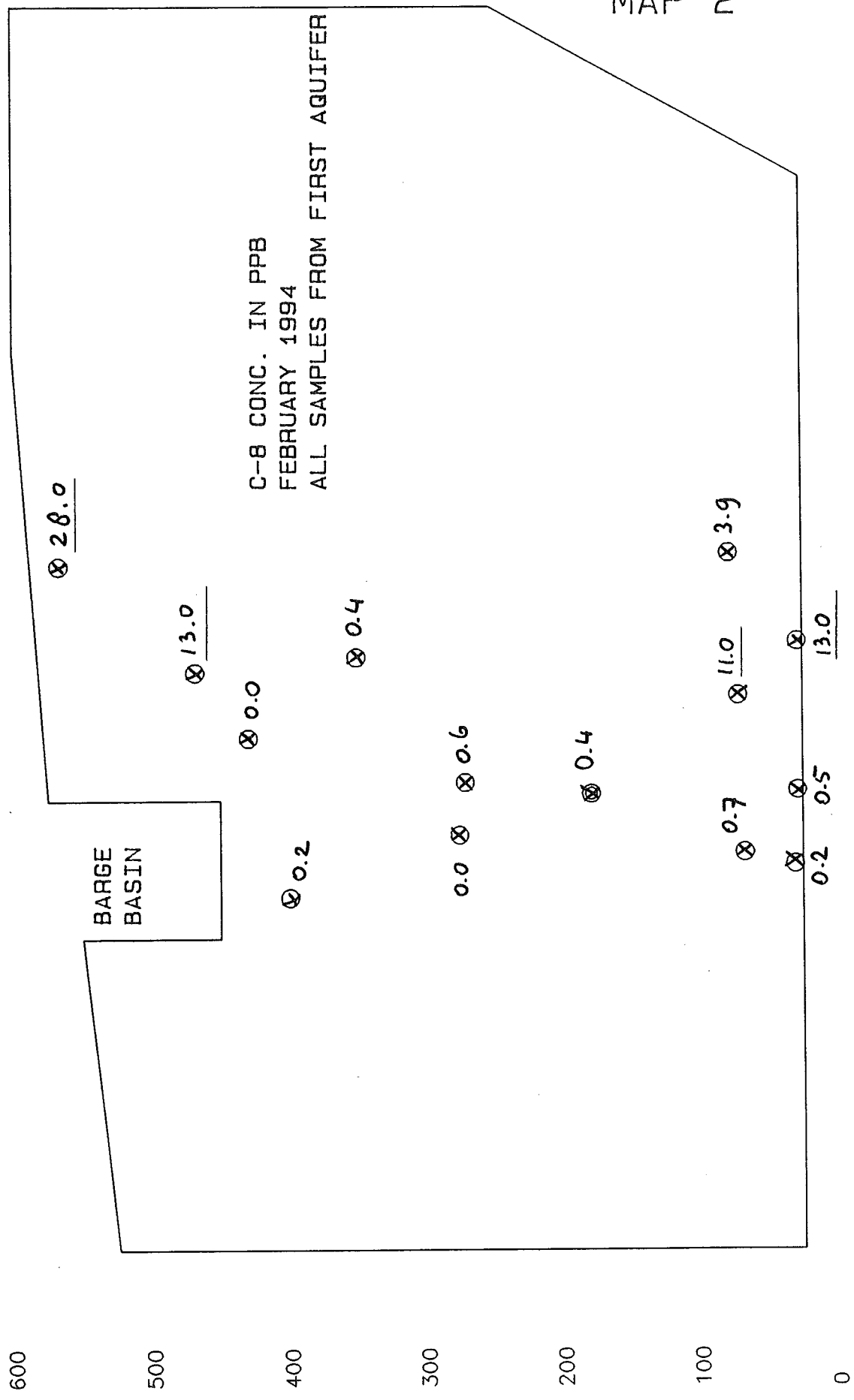
⊗ 3.0/0/0

⊗ 0.2/1.0

1600 1700 1800 1900 2000 2100 2200 2300 2400

GROUNDWATER WELLS AT DUPONT SITE

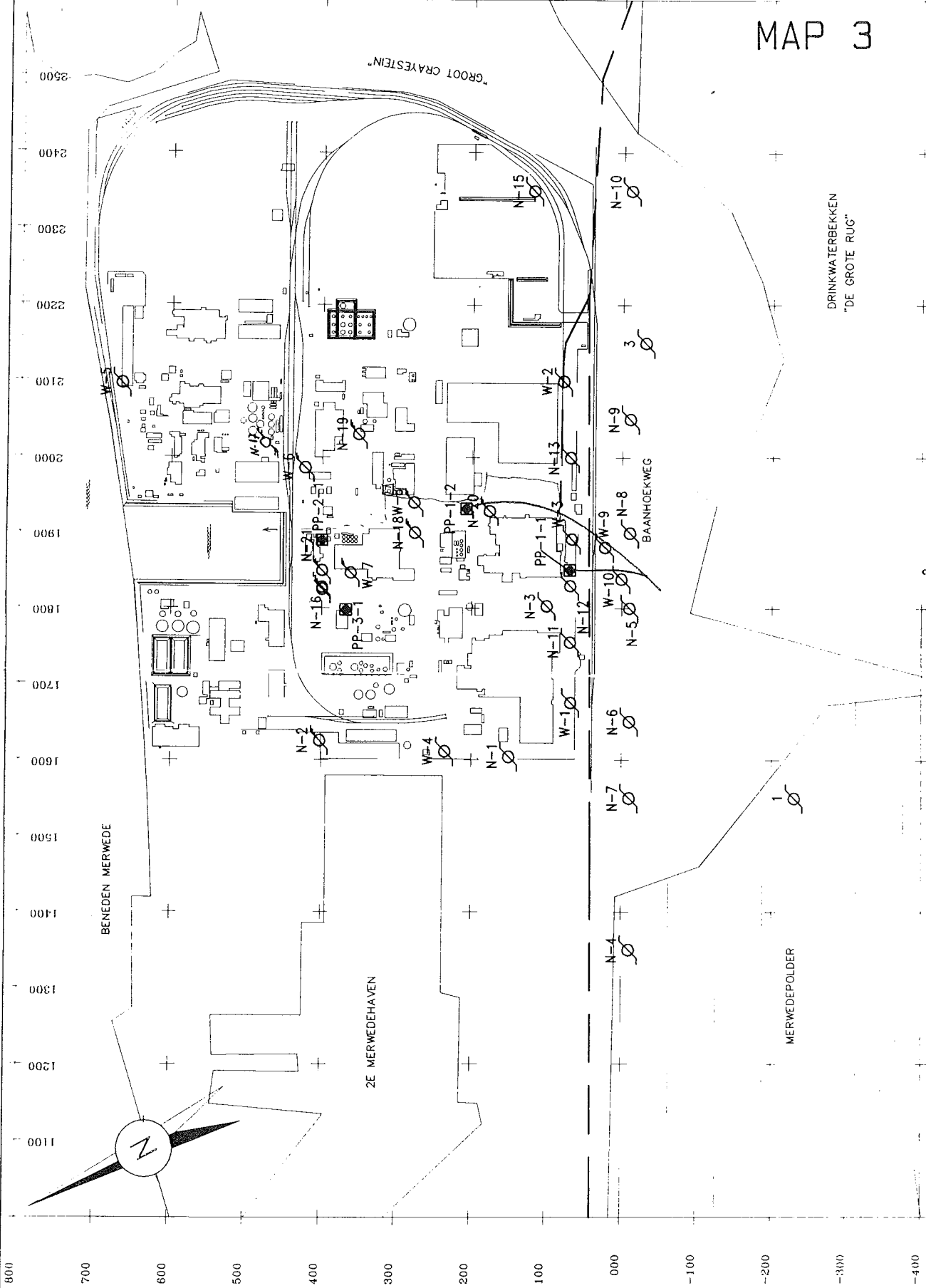
MAP 2



C-8 CONC. IN PPB
FEBRUARY 1994
ALL SAMPLES FROM FIRST AQUIFER

BARGE
BASIN

BAANHDEKWEG



DRINKWATERBEKKEN
"DE GROTE RUG"

waarnemingsput in de 1e waterverende laag N-4
waarnemingsput in de 2e waterverende laag W-1
waarnemingsput in de 3e waterverende laag W-2

waarnemingsput in de 1e waterverende laag N-15
waarnemingsput in de 2e waterverende laag W-10
waarnemingsput in de 3e waterverende laag W-9

'93-01-06	LUO
CO-332590	30 / 40
Bijl. 1.14	

GRONDMECHANICA DELFT
Postbus 64, 2600 AB Delft
Telefoon (015) 69 35 00
Telefax (015) 61 06 11

BASISONTWERP GEOHYDROLOGISCH BEHEERSSTEEEM
FABRIEKSTERREIN "DU PONT", TE DORDRECHT

ONTWERP MEETNET FASE 1
SCHAAL 1:5000

LEGE NDA: