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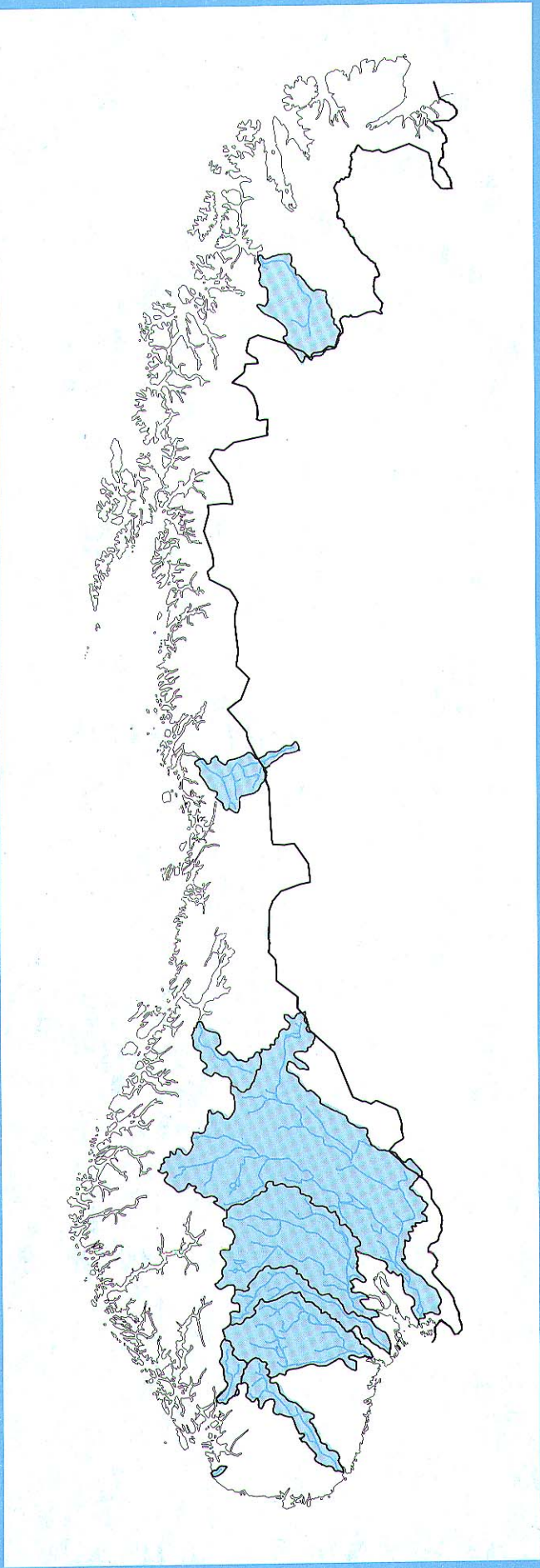
NIVA

Report 452B/91

Paris Convention

Annual report on direct and riverine inputs
to Norwegian coastal waters during the year
1990

B Data report



NIVA - REPORT

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Report No.: 0-90001
Sub-No.:
Serial No.: 2577
Limited distribution:

Report Title: Paris Convention. Annual report on direct and riverine inputs to Norwegian coastal waters during the year 1990: B. Data report.	Date: 20.6.1991
Author (s): Gjertrud Holtan Dag Berge Hans Holtan Terje Hopén	Topic group:
	Geographical area: Norway
	Number of pages (incl. app.) 103

Contractor: The Norwegian State Pollution Control Authorities (SFT).	Contractors ref. (or NTNF-No)
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Abstract: This report contains data from the 1990 monitoring of 155 Norwegian rivers and tributaries in accordance with requirements of the Paris Commission (PARCOM): i.e. riverborne inputs of selected substances (nutrients, heavy metals, PCBs and lindane) to Norwegian coastal waters. Runoff from about 75 per cent of the main land areas, and 94 per cent of the Skagerrak region, has been monitored. Discharges from areas not covered by the river monitoring stations, are estimated by use of specific activity- and runoff coefficients.
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4 keywords, Norwegian
1. Forurensningstilførsler
2. Norske kystområder
3. Elvetilførsler
4. Direkte tilførsler

4 keywords, English
1. Pollution inputs
2. Norwegian coastal waters
3. Riverine inputs
4. Direct discharges

Project leader


Hans Holtan

For the Administration


Dag Berge

ISBN 82-577-1900-5



The National Environmental
Monitoring Programme

Paris Convention

Annual report on direct and riverine inputs
to Norwegian coastal waters during the year
1990

B Data report

Oslo, June 1991

Project manager: Hans Holtan

Project coordinator: Gjertrud Holtan

Co-workers: Dag Berge

Terje Hopen

PREFACE

The report presents the data from the 1990 monitoring of waterborne pollutants, both riverine and direct discharges, to the Norwegian coastal waters. The study is part of a joint monitoring programme under the "Paris Convention for the prevention of Marine Pollution from Landbased Sources". The Norwegian contribution is administered by the Norwegian State Pollution Control Authority (SFT) which has contracted the Norwegian Institute for Water Research to perform the actual investigations.

The 1990-investigation lasted from January till December. This report is the Norwegian part of the 1990-study, divided into two parts:

- A: Principles - Results and Discussion*
- B: Data Report.*

The Programme Committee has consisted of Jon-Lasse Bratli (SFT), Dag Berge and Hans Holtan, the former being the project manager. The practical investigation is coordinated, and performed by Gjertrud Holtan. The calculations of all data has been performed by Terje Hopen. References and names of all participants at NIVA and the local sampling persons are given in paragraph 5 (Report A).

We would like to express our gratitude to all participants of the investigation, especially to the local fieldworkers for the collection and transport of the samples. The contact persons at the County Environmental Agencies and at the Municipality of Oslo and Bærum are acknowledged for continuous support and goodwill. The contact persons at the Norwegian Water Resources and Energy Administration (NVE) and The Norwegian Meteorological Institute (DNMI), Per Lofsberg and Stein Kristiansen, are acknowledged for their kind cooperation.

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- | | | | |
|------|-----------------------------|--------------|-------------------|
| (1) | Glomma "tributaries" | : Tista | - Hølenelva |
| (1) | Inner Oslo-fjord | : Årangelva | - Åroselva |
| (2) | Drammenselva "tributary" | : Lierelva | |
| (3) | Nømedalslågen "tributaries" | : Sandeelva | - Farriselva |
| (4) | Skienselva "tributary" | : Tokkeelva | |
| (5) | Otra "tributaries" | : Gjerstade. | - Audna |
| (6) | Orreelva "tributaries" | : Lygna | - Ulla |
| (7) | Suldalslågen "tributaries" | : Saudaelva | - Hornindalselva |
| (8) | Orkla "tributaries" | : Ørstaelva | - Salsvatnelva |
| (9) | Vefsna "tributaries" | : Åbjøra | - Reisa |
| (10) | Alta "tributaries" | : Mattiselva | - Grense Jacobse. |

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CONVENTION FOR THE PREVENTION OF MARINE POLLUTION FROM LANDBASED SOURCES

QUESTIONARY ACCORDING TO THE TENTH MEETING OF THE PARIS COMMISSION

LISBON 15 - 17 JUNE 1988

The purpose of this form is to provide the Commission, in accordance with Article 17(B) of the Paris Convention, with an assessment of the waterborne inputs to Convention waters.

The form should be completed for each calender year in retrospect and submitted to the Sectretary by June following the year to which the data relate.

The information sought relates to inputs through direct discharges (questions 7 - 13) and riverine inputs (questions 14 - 19). Some information on discharges other than those mentioned below are also attached (question 20).

Separate forms for the four single areas are filled in.

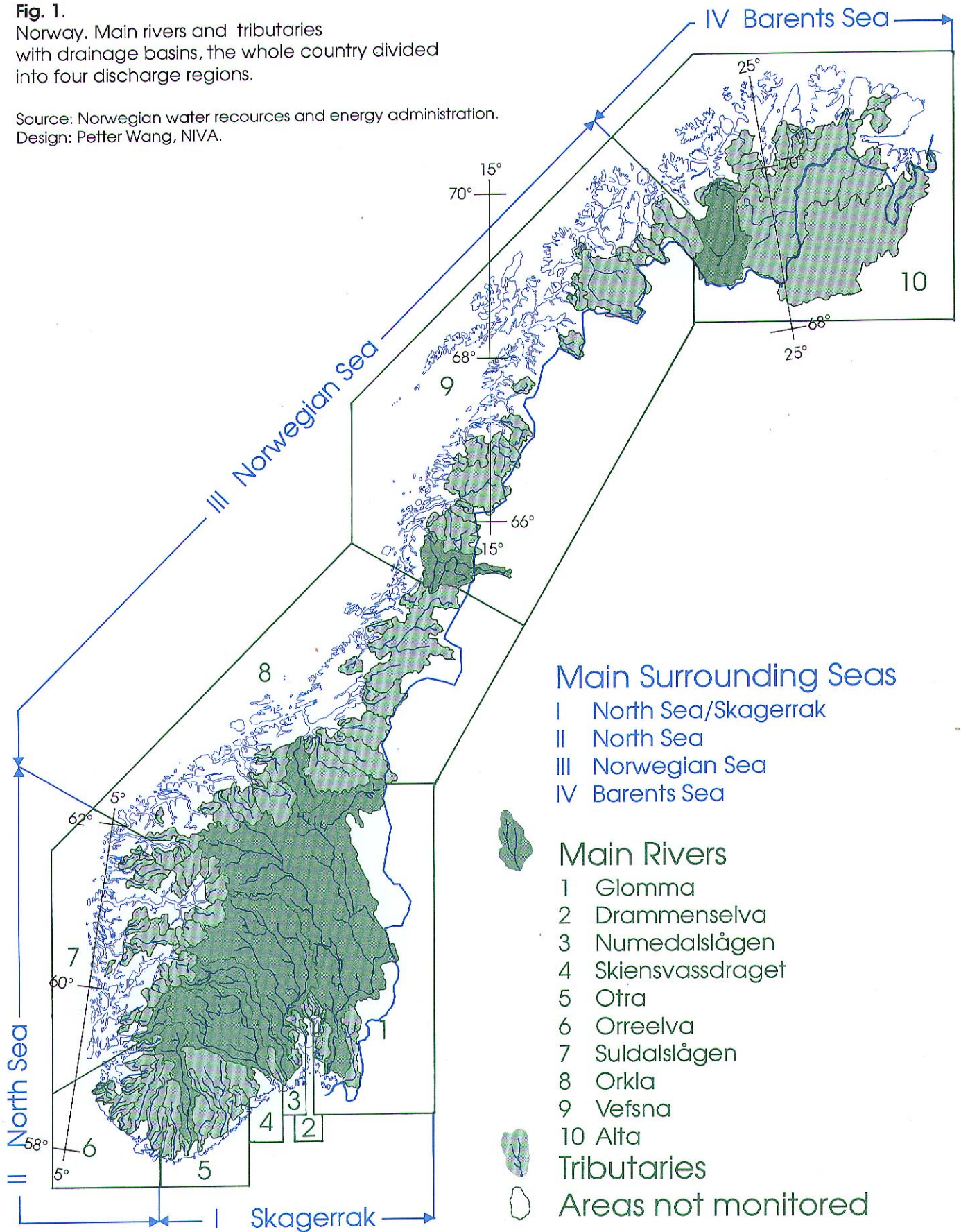
(1) THE COUNTRY IS NORWAY

(2) LENGTH OF COASTLINE INCLUDING FJORDS AND BAYS IS 21347 KM

(3) NATURE OF THE RECEIVING WATER IS COASTAL

Fig. 1.
 Norway. Main rivers and tributaries
 with drainage basins, the whole country divided
 into four discharge regions.

Source: Norwegian water resources and energy administration.
 Design: Petter Wang, NIVA.



APPENDIX I : TOTAL DISCHARGES (Paragraph 4 – 6)

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Paragraph 4: Direct Discharges**Paragraph 5: Riverine Discharges****Paragraph 6: Grand Total**

**Table I TOTAL DISCHARGES from MAINLAND NORWAY
to convention waters 1990 (Fig. I).**

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.8	2.1 *	4.4 *	7.3	tonnes
Cadmium			31.3 **	10.2 **	42.2	tonnes
Mercury		579	10 *	38 *	627	kg
Mercury			361 **	149 **	1089	kg
Copper		89	344	194	627	tonnes
Zinc		82	1106	482	1670	tonnes
Lead		11.9	39.2 *	24.0 *	75.1	tonnes
Lead			108.3 **	46.9 **	167.0	tonnes
PCBs ***			0.2 *	73.9 *	74.1	kg
PCBs			621.0 **	268.5 **	889.5	kg
gamma-HCH			371	160	531	kg
NO3-N			20582	13802	34385	tonnes
PO4-P			305	258	563	tonnes
Total N	23442	14195	40442	23098	101178	tonnes
Total P	715	1209	1347	714	3985	tonnes
S.P.M.		5067443	238790	358160	5664394	tonnes
TOC		555		81040	81595	tonnes
COD		280407			280407	tonnes
BOD		38128			38128	tonnes

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

Table 1.1 TOTAL DISCHARGES to The Skagerrak Region 1990 (Fig. I.I).

The Skagerrak Region with main rivers (1) Glomma, (2) Drammenselva, (3) Numedalslågen, (4) Skienselva, (5) Otra

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.2	0.1 *	4.2 *	4.4	tonnes
Cadmium			1.6 **	8.7 **	10.5	tonnes
Mercury		216	0 *	35 *	251	kg
Mercury			32 **	121 **	369	kg
Copper		62	33	139	235	tonnes
Zinc		30	156	377	563	tonnes
Lead		2.7	3.9 *	17.9 *	24.5	tonnes
Lead			9.8 **	35.7 **	48.2	tonnes
PCBs ***			0.2 *	72.9 *	73.1	kg
PCBs			56.2 **	220.6 **	276.8	kg
gamma-HCH			49	140	189	kg
NO3-N			3898	12404	16302	tonnes
PO4-P			34	234	268	tonnes
Total N	2779	6764	6941	20238	36722	tonnes
Total P	75	349	182	627	1234	tonnes
S.P.M.		22048	22982	325686	370716	tonnes
TOC		445		80448	80893	tonnes
COD		190545			190545	tonnes
BOD		13869			13869	tonnes

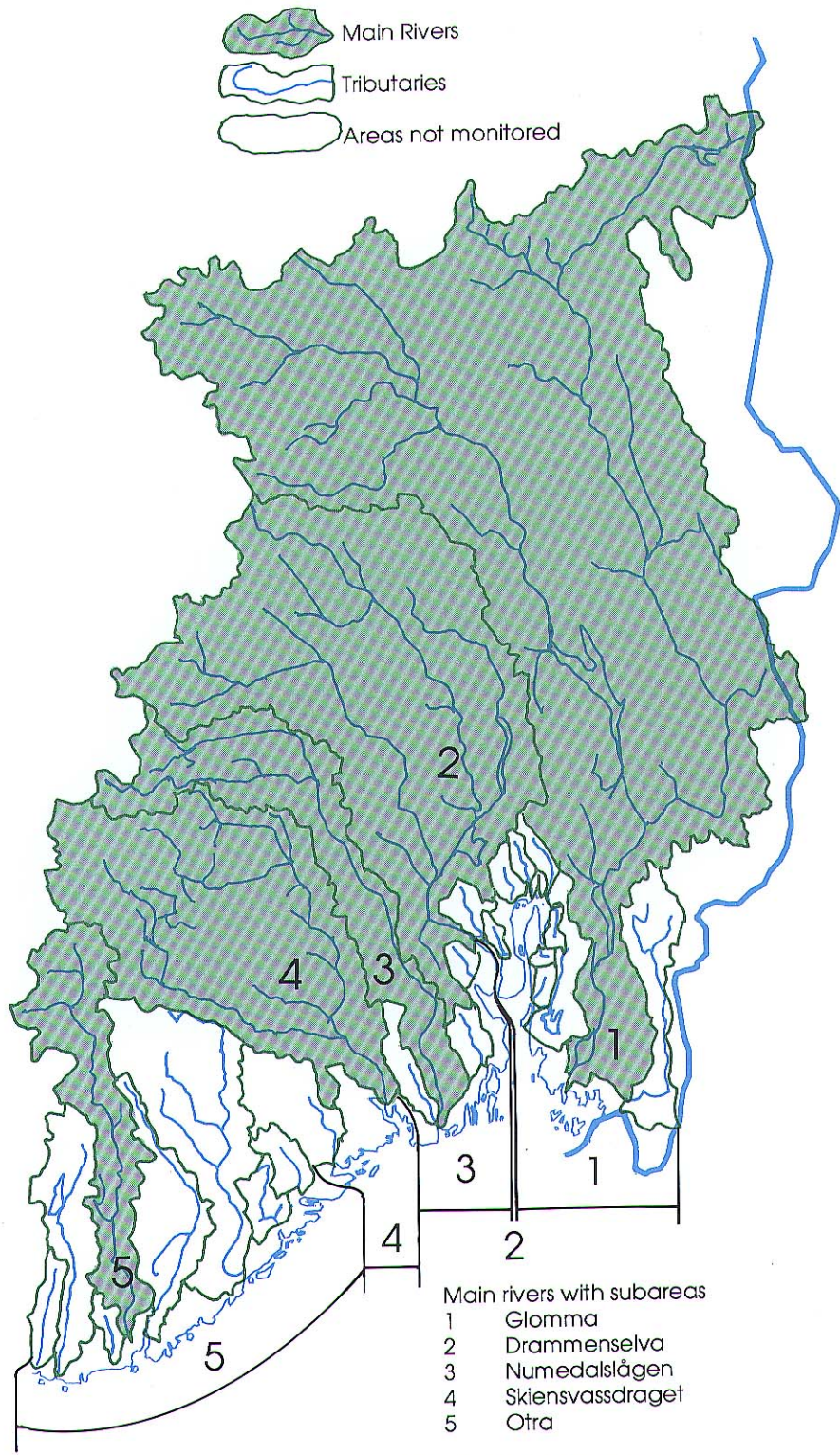
Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

Fig. 1.1
Main Rivers and Tributaries draining to
The Skagerrak Region of The North Sea.



I North Sea/Skagerrak

**Table 1.2 TOTAL DISCHARGES to The Remaining North Sea
1990 (Fig. I.II).**

The North Sea Region with main rivers : (6) Orreelva, (7) Suldalslågen

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.5	0.4 *	0.1 *	1.0	tonnes
Cadmium			14.1 **	0.3 **	14.9	tonnes
Mercury		233	10 *	2 *	244	kg
Mercury			142 **	5 **	380	kg
Copper		17	101	32	149	tonnes
Zinc		32	413	57	502	tonnes
Lead		7.3	23.4 *	0.6 *	31.3	tonnes
Lead			45.1 **	1.5 **	53.9	tonnes
PCBs ***			0.0 *	0.2 *	0.2	kg
PCBs			236.6 **	9.0 **	245.5	kg
gamma-HCH			224	2	226	kg
NO3-N			9891	381	10272	tonnes
PO4-P			89	7	96	tonnes
Total N	9109	3979	15477	811	29376	tonnes
Total P	188	421	434	26	1069	tonnes
S.P.M.		2030253	73626	7687	2111566	tonnes
TOC		20		592	612	tonnes
COD		38356			38356	tonnes
BOD		11448			11448	tonnes

Measurements below detection limits are treated in two ways :

- *) Detection limit = Zero
- **) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

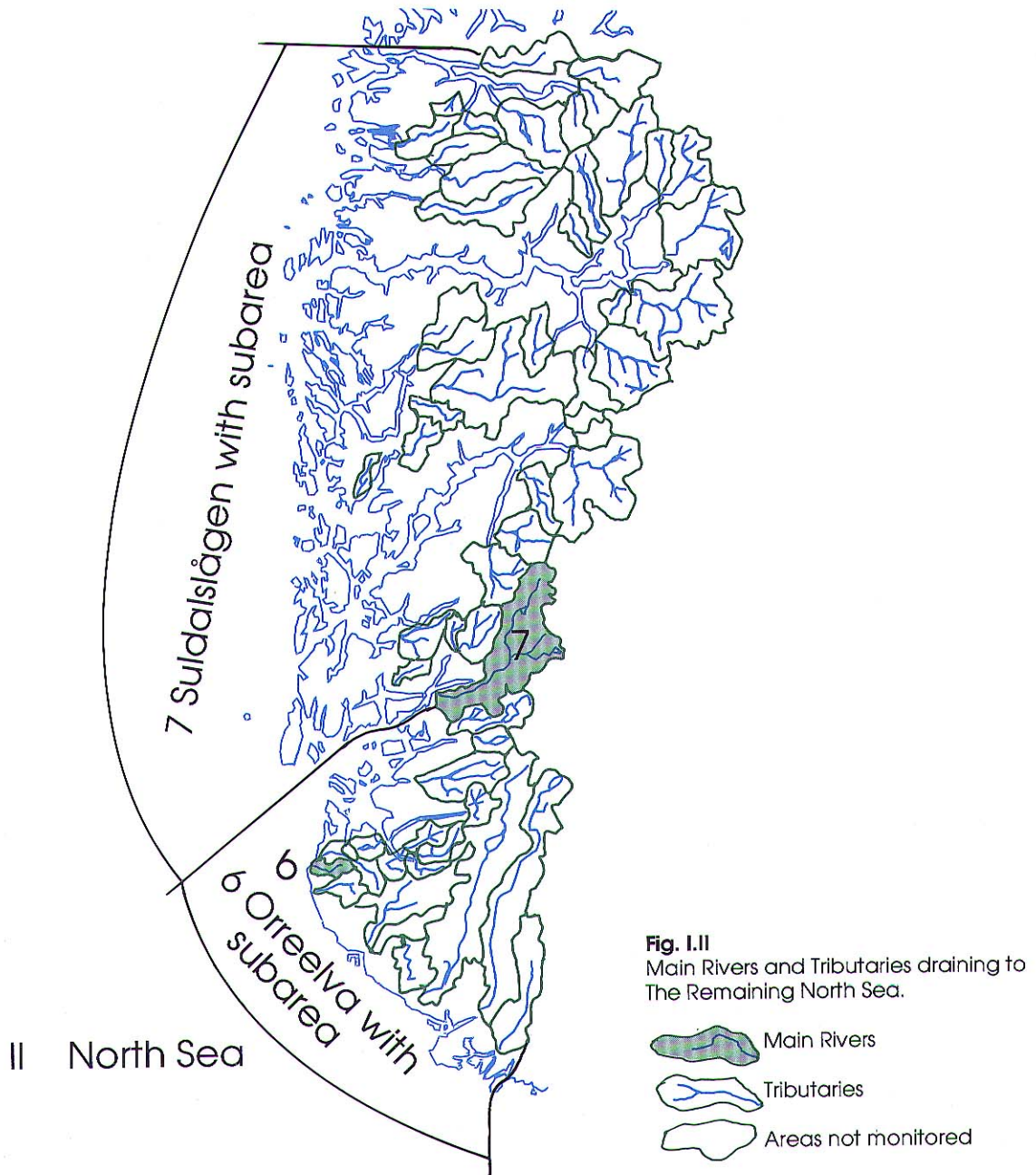


Table 1.3 TOTAL DISCHARGES to The Norwegian Sea 1990 (Fig. I.III).

The Norwegian Sea Region with main rivers (8) Orkla, (9) Vefsna

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.1	1.6 *	0.1 *	1.8	tonnes
Cadmium			13.9 **	0.9 **	14.9	tonnes
Mercury		120	0 *	1 *	121	kg
Mercury			156 **	18 **	293	kg
Copper		10	186	19	215	tonnes
Zinc		19	451	41	511	tonnes
Lead		1.7	0.9 *	5.4 *	8.1	tonnes
Lead			39.3 **	8.6 **	49.6	tonnes
PCBs ***			0.0 *	0.7 *	0.7	kg
PCBs			272.4 **	31.3 **	303.7	kg
gamma-HCH			73	16	89	kg
NO3-N			6387	930	7317	tonnes
PO4-P			166	12	178	tonnes
Total N	9957	3231	15712	1677	30577	tonnes
Total P	370	410	641	43	1463	tonnes
S.P.M.		1514435	126892	22422	1663749	tonnes
TOC		90			90	tonnes
COD		49739			49739	tonnes
BOD		12002			12002	tonnes

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

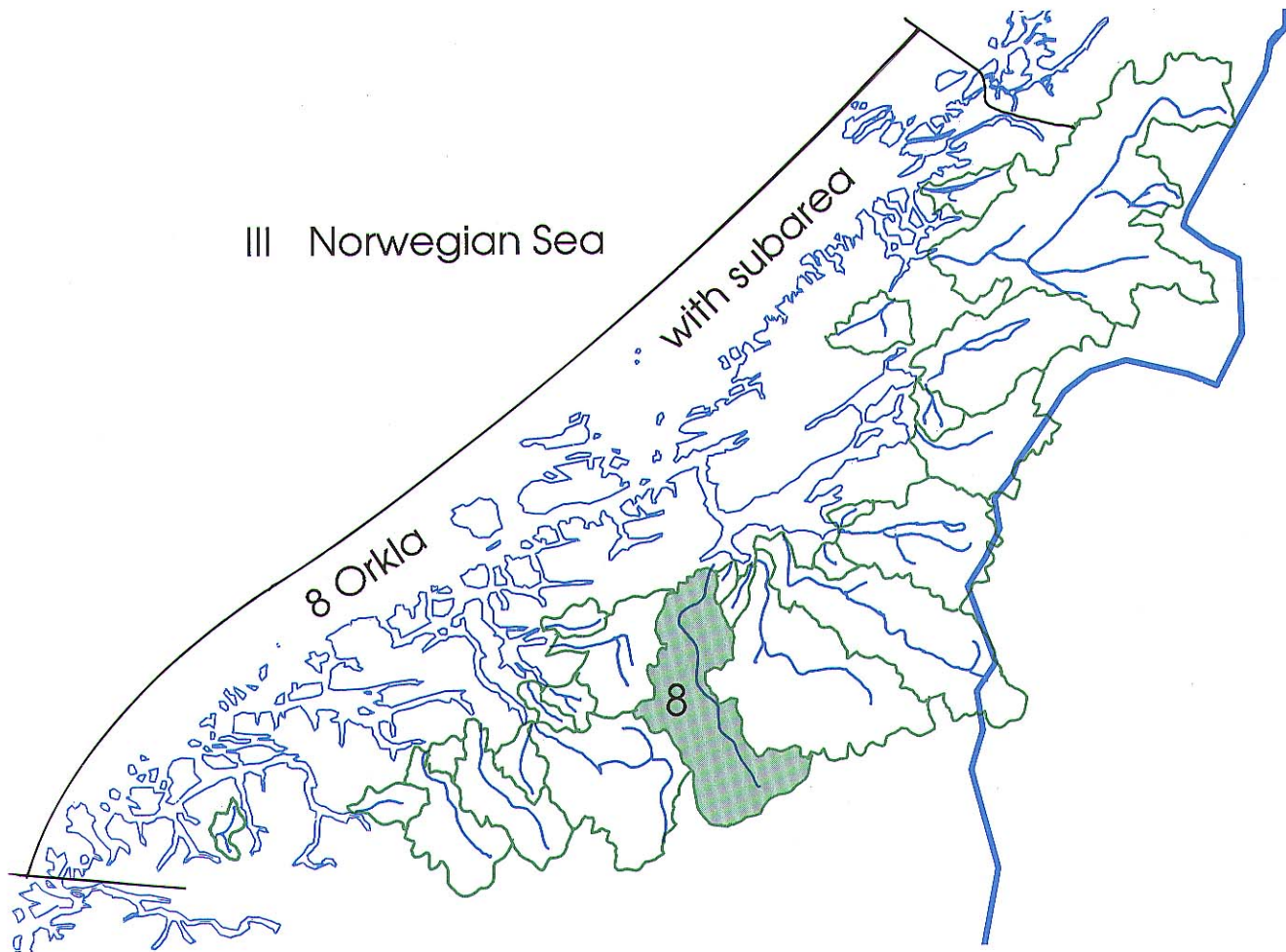





Fig. I.III A
 Main Rivers and Tributaries draining to
 The Norwegian Sea (Southern Part).

-  Main Rivers
-  Tributaries
-  Areas not monitored

III Norwegian Sea

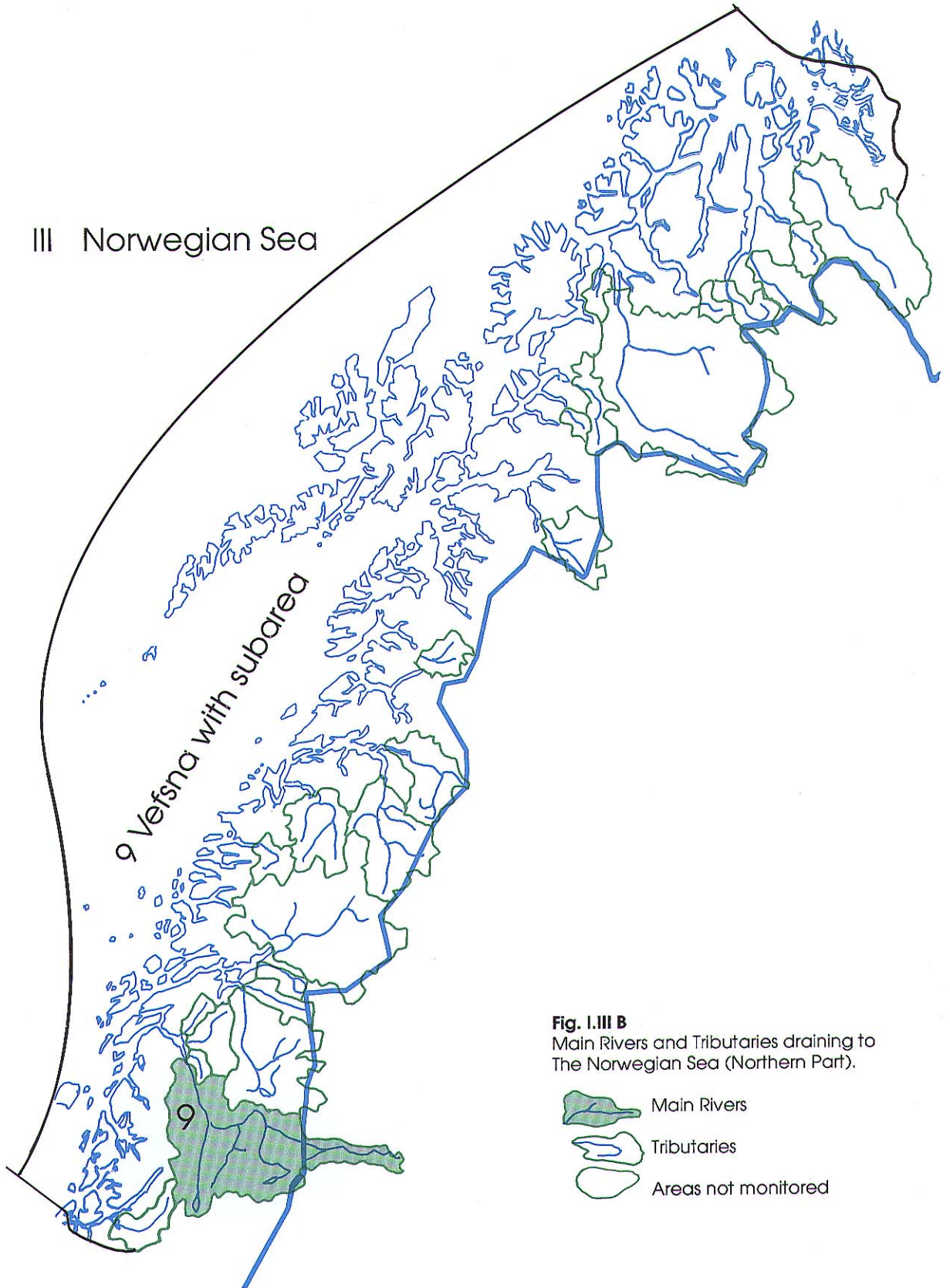


Fig. I.III B
Main Rivers and Tributaries draining to
The Norwegian Sea (Northern Part).

-  Main Rivers
-  Tributaries
-  Areas not monitored

Table 1.4 TOTAL DISCHARGES to The Barents Sea 1990 (Fig. I.IV).

The Barents Sea Region with main river (10) Alta

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.0	0.0 *	0.1 *	0.1	tonnes
Cadmium			1.6 **	0.2 **	1.8	tonnes
Mercury		10	0 *	0 *	10	kg
Mercury			32 **	4 **	47	kg
Copper		1	24	4	28	tonnes
Zinc		1	86	7	93	tonnes
Lead		0.1	11.1 *	0.0 *	11.2	tonnes
Lead			14.1 **	1.1 **	15.3	tonnes
PCBs ***			0.0 *	0.0 *	0.0	kg
PCBs			55.8 **	7.7 **	63.5	kg
gamma-HCH			25	2	27	kg
NO3-N			407	86	493	tonnes
PO4-P			17	5	21	tonnes
Total N	1597	221	2313	373	4504	tonnes
Total P	83	29	90	18	220	tonnes
S.P.M.		1500707	15290	2365	1518362	tonnes
TOC		0				tonnes
COD		1768			1768	tonnes
BOD		809			809	tonnes

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

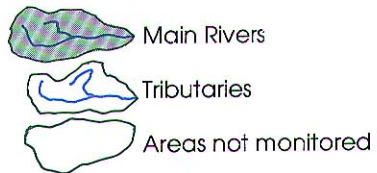
*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

IV Barents Sea

10 Alta with subarea



Fig. I.IV
Main Rivers and Tributaries draining to
The Barents Sea.



**APPENDIX II : SEWAGE EFFLUENTS FROM DOWN STREAM AREAS OF MAIN
AND TRIBUTARY RIVERS AND RIVERS NOT MONITORED
1990 (Paragraph 7 - 8)**

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Paragraph 7: Sewage effluents ./.

**Paragraph 8: Measurements of calculation used - including information
on the concentration upon which the measurement is based:**

Paragraph 3.3 (Report A)

Municipal sewage includes a portion of industrial effluents

Table II Sewage Effluents from down stream areas of mainland Norway to convention waters (1990).

Total quantity of substance discharged per year:

Regions:	I	II	III	IV	Sum	
	The	The	The	The		
Substance:	Skagerrak	North	Norwegian	Barents		
	Region	Sea	Sea	Sea		
Cd	155	113	86	7	360	kg
Hg	208	158	120	10	496	kg
Cu	15.4	12.6	9.6	0.8	38.4	tonnes
Zn	26.9	19.4	14.7	1.3	62.3	tonnes
Pb	2206	1803	1370	117	5496	kg
PCBs						kg
gamma-HCH						kg
NO3-N						tonnes
PO4-P						tonnes
Tot-N.	4751	3185	2190	220	10346	tonnes
Tot-P	287	383	306	29	1005	tonnes
S.P.M.	9081	9321	10025	707	29134	tonnes
TOC	393				393	tonnes
COD	29219	24540	26135	1768	81662	tonnes
BOD	13805	10400	10577	789	35571	tonnes

Table 2.1 Sewage Effluents to The Skagerrak Region (1990).

The Skagerrak region with sub-areas: (1) Glomma, (2) Drammenselva,
(3) Numedalslågen, (4) Skienselva, (5) Otra

Sub-areas :	Total quantity of substance discharged per year:					Precision of the estimate of the load	
	1	2	3	4	5		
Substance:							
Cd	63	5	39	16	32	kg	_____ %
Hg	80	7	54	22	44	kg	_____ %
Cu	5.1	0.6	4.3	1.8	3.6	tonnes	_____ %
Zn	11.1	0.9	6.6	2.7	5.5	tonnes	_____ %
Pb	741	85	618	253	508	kg	_____ %
PCBs						kg	_____ %
gamma-HCH						kg	_____ %
NO3-N						tonnes	_____ %
PO4-P						tonnes	_____ %
Tot-N	2656	104	905	361	725	tonnes	_____ %
Tot-P	51	16	124	16	80	tonnes	_____ %
S.P.M.	3514	426	2675	486	1980	tonnes	_____ %
TOC	393					tonnes	_____ %
COD	14158	1044	6872	1763	5383	tonnes	_____ %
BOD	6807	487	3263	817	2431	tonnes	_____ %

Table 2.2 Sewage Effluents to The Remaining North Sea Region (1990).

The remaining North Sea Region with sub-areas: (6) Orreelva, (7) Suldalslågen

Sub-areas :	Total quantity of substance discharged per year:			Precision of the estimate of the load
	6	7		
Substance:				
Cd	36	77	kg	_____ %
Hg	50	107	kg	_____ %
Cu	4.0	8.6	tonnes	_____ %
Zn	6.2	13.2	tonnes	_____ %
Pb	575	1227	kg	_____ %
PCBs			kg	_____ %
gamma-HCH			kg	_____ %
NO3-N			tonnes	_____ %
PO4-P			tonnes	_____ %
Tot-N	976	2208	tonnes	_____ %
Tot-P	127	256	tonnes	_____ %
S.P.M.	3200	6122	tonnes	_____ %
TOC			tonnes	_____ %
COD	7793	16746	tonnes	_____ %
BOD	3508	6892	tonnes	_____ %

Table 2.3 Sewage Effluents to The Norwegian Sea Region (1990).

The Norwegian Sea Region with sub-areas: (8) Orkla, (9) Vefsna

Sub-areas :	Total quantity of substance discharged per year:			Precision of the estimate of the load
	8	9		
Substance:				
Cd	45	41	kg	_____ %
Hg	62	57	kg	_____ %
Cu	5.0	4.6	tonnes	_____ %
Zn	7.7	7.1	tonnes	_____ %
Pb	714	656	kg	_____ %
PCBs			kg	_____ %
gamma-HCH			kg	_____ %
NO3-N			tonnes	_____ %
PO4-P			tonnes	_____ %
Tot-N	1563	627	tonnes	_____ %
Tot-P	192	115	tonnes	_____ %
S.P.M.	5199	4825	tonnes	_____ %
TOC			tonnes	_____ %
COD	13863	12272	tonnes	_____ %
BOD	5489	5088	tonnes	_____ %

Table 2.4 Sewage Effluents to The Barents Sea Region (1990).

The Barents Sea Region with sub-area: (10) Alta

Total quantity of substance discharged per year:			Precision
Sub-area :	10		of the estimate of the load
Substance:			
Cd	7	kg	_____ %
Hg	10	kg	_____ %
Cu	0.8	tonnes	_____ %
Zn	1.3	tonnes	_____ %
Pb	117	kg	_____ %
PCBs		kg	_____ %
gamma-HCH		kg	_____ %
NO3-N		tonnes	_____ %
PO4-P		tonnes	_____ %
Tot-N	220	tonnes	_____ %
Tot-P	29	tonnes	_____ %
S.P.M.	707	tonnes	_____ %
TOC		tonnes	_____ %
COD	1768	tonnes	_____ %
BOD	789	tonnes	_____ %

APPENDIX III : INDUSTRIAL EFFLUENTS FROM DOWN STREAM AREAS OF MAIN AND TRIBUTARY RIVERS AND RIVERS NOT MONITORED 1990 Page:
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Paragraph 11: Industrial effluents ./.

Paragraph 12: Measurements of calculation used - including information on the concentration upon which the measurement is based:

Paragraph 3.3 (Report A)

Paragraph 13: Any other relevant information (e.g. proportion of substance discharged as insoluble material):

A portion of industrial effluents is included in municipal sewage

Table III Industrial Effluents from down stream areas of mainland Norway to convention waters (1990).

Total quantity of substance discharged per year:

Regions:	I	II	III	IV	Sum	
	The	The	The	The		
Substance:	Skagerrak	North Norwegian	Norwegian	Barents		
		Sea	Sea	Sea		
Cd	1	385	7	0	394	kg
Hg	8	75	0	0	83	kg
Cu	46.8	4.0	0.0	0.0	50.9	tonnes
Zn	2.9	12.3	4.0	0.0	19.2	tonnes
Pb	506	5500	360	0	6366	kg
PCBs						kg
gamma-HCH						kg
NO3-N						tonnes
PO4-P						tonnes
Tot-N	2014	794	1040	1	3849	tonnes
Tot-P	62	38	103	1	204	tonnes
S.P.M.	12968	2020932	1504411	1500000	5038310	tonnes
TOC	52	20	90	0	162	tonnes
COD	161326	13816	23604	0	198746	tonnes
BOD	64	1048	1425	20	2557	tonnes

Table 3.1 Industrial Effluents to The Skagerrak Region (1990).

The Skagerrak Region with sub-areas: (1) Glomma, (2) Drammenselva,
(3) Numedalslågen, (4) Skienselva, (5) Otra

Sub-areas :	Total quantity of substance discharged per year:					Precision of the estimate of the load
	1	2	3	4	5	
Substance:						
Cd	1	0	0	0	0	kg _____ %
Hg	8	0	0	0	0	kg _____ %
Cu	46.8	0.0	0.0	0.1	0.0	tonnes _____ %
Zn	2.0	0.0	0.0	0.0	0.9	tonnes _____ %
Pb	163	0	15	0	329	kg _____ %
PCBs						kg _____ %
gamma-HCH						kg _____ %
NO3-N						tonnes _____ %
PO4-P						tonnes _____ %
Tot-N	308	136	31	1538	0	tonnes _____ %
Tot-P	36	5	3	16	2	tonnes _____ %
S.P.M.	5710	890	2260	4108	0	tonnes _____ %
TOC	0	0	38	14	0	tonnes _____ %
COD	84710	19897	37834	18665	219	tonnes _____ %
BOD	0	0	0	0	64	tonnes _____ %

Table 3.2 Industrial Effluents to The Remaining North Sea Region (1990).

The remaining North Sea Region with sub-areas: (6) Orreelva, (7) Suldalslågen

Sub-areas :	Total quantity of substance discharged per year:			Precision of the estimate of the load
	6	7		
Substance:				
Cd	0	385	kg	_____ %
Hg	0	75	kg	_____ %
Cu	0.0	4.0	tonnes	_____ %
Zn	0.0	12.3	tonnes	_____ %
Pb	0	5500	kg	_____ %
PCBs			kg	_____ %
gamma-HCH			kg	_____ %
NO3-N			tonnes	_____ %
PO4-P			tonnes	_____ %
Tot-N	28	767	tonnes	_____ %
Tot-P	2	36	tonnes	_____ %
S.P.M.	2000021	20911	tonnes	_____ %
TOC	0	20	tonnes	_____ %
COD	306	13510	tonnes	_____ %
BOD	191	857	tonnes	_____ %

Table 3.3 Industrial Effluents to The Norwegian Sea Region (1990).

The Norwegian Sea Region with sub-areas: (8) Orkla, (9) Vefsna

Sub-areas :	Total quantity of substance discharged per year:			Precision of the estimate of the load
	8	9		
Substance:				
Cd	0	7	kg	_____ %
Hg	0	0	kg	_____ %
Cu	0.0	0.0	tonnes	_____ %
Zn	0.0	4.0	tonnes	_____ %
Pb	0	360	kg	_____ %
PCBs			kg	_____ %
gamma-HCH			kg	_____ %
NO3-N			tonnes	_____ %
PO4-P			tonnes	_____ %
Tot-N	168	872	tonnes	_____ %
Tot-P	29	74	tonnes	_____ %
S.P.M.	3711	1500700	tonnes	_____ %
TOC	0	90	tonnes	_____ %
COD	23604	0	tonnes	_____ %
BOD	919	506	tonnes	_____ %

Table 3.4 Industrial Effluents to The Barents Sea Region (1990).

The Barents Sea Region with sub-area: (10) Alta

Total quantity of substance discharged per year:			Precision
Sub-area :	10		of the estimate of the load
Substance:			
Cd	0	kg	_____ %
Hg	0	kg	_____ %
Cu	0.0	tonnes	_____ %
Zn	0.0	tonnes	_____ %
Pb	0	kg	_____ %
PCBs		kg	_____ %
gamma-HCH		kg	_____ %
NO3-N		tonnes	_____ %
PO4-P		tonnes	_____ %
Tot-N	1	tonnes	_____ %
Tot-P	1	tonnes	_____ %
S.P.M.	1500000	tonnes	_____ %
TOC	0	tonnes	_____ %
COD	0	tonnes	_____ %
BOD	20	tonnes	_____ %

APPENDIX IV : MAIN RIVERINE INPUTS 1990 (Paragraph 14 - 16)

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Paragraph 14: Main Rivers ./.

Paragraph 15: Measurements of calculation used - including information on the concentration upon which the measurement is based:

Appendix VII (1-10) and Paragraph 3.2 (Report A)

Paragraph 16: Any other relevant information (e.g. proportion of substance discharged as insoluble material):

Table 4.1 MAIN RIVERINE INPUTS 1990 (1) Glomma

				Total quantity of substance discharged per year		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Total volume:	64411	1000 m3/day	Cadmium *	0.0 tonnes		NO	%
Minimum flow:	26525	1000 m3/day	Cadmium **	2.4 tonnes			%
Maximum flow	156125	1000 m3/day	Mercury *	6.9 kg		NO	%
			Mercury **	47.6 kg			%
			Copper	68.8 tonnes		YES	%
			Zinc	146.3 tonnes		YES	%
			Lead *	6.5 tonnes		NO	%
			Lead **	15.3 tonnes			%
			PCBs *	33.3 kg		NO	%
			PCBs **	94.8 kg			%
			gamma-HCH (lindane)	54.2 kg		YES	%
			Nitrates (NO3-N)	6628 tonnes		YES	%
			Orthophosphates (PO4-P)	177 tonnes		YES	%
			Total N	10718 tonnes		YES	%
			Total P	418 tonnes		YES	%
			Suspended Particulate Matter	278050 tonnes		YES	%
			Others : TOC	80448 tonnes		YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.2 MAIN RIVERINE INPUTS 1990 (2) Drammenselva.

			Total quantity of substance discharged per year	Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load	
Total volume:	25896	1000 m3/day	Cadmium *	1.0 tonnes	NO	_____ %
Minimum flow:	10100	1000 m3/day	Cadmium **	1.6 tonnes		_____ %
Maximum flow	59694	1000 m3/day	Mercury *	13.2 kg	NO	_____ %
			Mercury **	27.1 kg		_____ %
			Copper	12.4 tonnes	YES	_____ %
			Zinc	40.7 tonnes	YES	_____ %
			Lead *	3.5 tonnes	NO	_____ %
			Lead **	6.3 tonnes		_____ %
			PCBs *	10.5 kg	NO	_____ %
			PCBs **	37.3 kg		_____ %
			gamma-HCH (lindane)	23.1 kg	YES	_____ %
			Nitrates (NO3-N)	1960 tonnes	YES	_____ %
			Orthophosphates (PO4-P)	18 tonnes	YES	_____ %
			Total N	3217 tonnes	YES	_____ %
			Total P	56 tonnes	YES	_____ %
			Suspended Particulate Matter	11950 tonnes	YES	_____ %
			Others : TOC	tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.3 MAIN RIVERINE INPUTS 1990 (3) Numedalslågen.

				Total quantity of substance discharged per year		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Total volume:	9978	1000 m3/day	Cadmium *	0.2 tonnes		NO	%
Minimum flow:	3404	1000 m3/day	Cadmium **	0.4 tonnes			%
Maximum flow	37126	1000 m3/day	Mercury *	1.8 kg		NO	%
			Mercury **	8.1 kg			%
			Copper	6.2 tonnes		YES	%
			Zinc	23.1 tonnes		YES	%
			Lead *	1.8 tonnes		NO	%
			Lead **	2.6 tonnes			%
			PCBs *	2.9 kg		NO	%
			PCBs **	14.7 kg			%
			gamma-HCH (lindane)	8.6 kg		YES	%
			Nitrates (NO3-N)	621 tonnes		YES	%
			Orthophosphates (PO4-P)	19 tonnes		YES	%
			Total N	1218 tonnes		YES	%
			Total P	40 tonnes		YES	%
			Suspended Particulate Matter	16500 tonnes		YES	%
			Others : TOC	tonnes		YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.4 MAIN RIVERINE INPUTS 1990 (4) Skienselva.

				Total quantity of substance discharged per year		Were 70 % of measurements above the detection limit ?		Precision of the estimate of the load
Total volume:	26603	1000 m3/day	Cadmium *	1.0	tonnes	NO	_____	%
Minimum flow:	4320	1000 m3/day	Cadmium **	1.7	tonnes		_____	%
Maximum flow	66269	1000 m3/day	Mercury *	10.1	kg	NO	_____	%
			Mercury **	23.9	kg		_____	%
			Copper	42.8	tonnes	YES	_____	%
			Zinc	118.0	tonnes	YES	_____	%
			Lead *	4.2	tonnes	NO	_____	%
			Lead **	7.4	tonnes		_____	%
			PCBs *	15.7	kg	NO	_____	%
			PCBs **	44.6	kg		_____	%
			gamma-HCH (lindane)	28.4	kg	YES	_____	%
			Nitrates (NO3-N)	2370	tonnes	YES	_____	%
			Orthophosphates (PO4-P)	12	tonnes	YES	_____	%
			Total N	3514	tonnes	YES	_____	%
			Total P	65	tonnes	YES	_____	%
			Suspended Particulate Matter	11628	tonnes	YES	_____	%
			Others : TOC		tonnes	YES	_____	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.5 MAIN RIVERINE INPUTS 1990 (5) Otra.

				Total quantity of substance discharged per year		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Total volume:	18266	1000 m3/day	Cadmium *	2.0 tonnes		NO	%
Minimum flow:	4916	1000 m3/day	Cadmium **	2.6 tonnes			%
Maximum flow	75738	1000 m3/day	Mercury *	2.9 kg		NO	%
			Mercury **	14.8 kg			%
			Copper	9.4 tonnes		YES	%
			Zinc	49.1 tonnes		YES	%
			Lead *	1.9 tonnes		NO	%
			Lead **	4.1 tonnes			%
			PCBs *	10.5 kg		NO	%
			PCBs **	29.3 kg			%
			gamma-HCH (lindane)	25.5 kg		YES	%
			Nitrates (NO3-N)	826 tonnes		YES	%
			Orthophosphates (PO4-P)	7 tonnes		YES	%
			Total N	1571 tonnes		YES	%
			Total P	48 tonnes		YES	%
			Suspended Particulate Matter	7557 tonnes		YES	%
			Others : TOC	tonnes		YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.6 MAIN RIVERINE INPUTS 1990 (6) Orreelva.

				Total quantity of substance discharged per year		Were 70% of measurements above the detection limit ?	Precision of the estimate of the load
Total volume:	271	1000 m3/day	Cadmium *	0.01 tonnes		NO	%
Minimum flow:	60	1000 m3/day	Cadmium **	0.03 tonnes			%
Maximum flow	2946	1000 m3/day	Mercury *	0.07 kg		NO	%
			Mercury **	0.41 kg			%
			Copper	0.16 tonnes		YES	%
			Zinc	0.44 tonnes		YES	%
			Lead *	0.06 tonnes		NO	%
			Lead **	0.14 tonnes			%
			PCBs *	0.24 kg		NO	%
			PCBs **	0.88 kg			%
			gamma-HCH (lindane)	0.22 kg		YES	%
			Nitrates (NO3-N)	69 tonnes		YES	%
			Orthophosphates (PO4-P)	1.5 tonnes		YES	%
			Total N	139 tonnes		YES	%
			Total P	7.8 tonnes		YES	%
			Suspended Particulate Matter	998 tonnes		YES	%
			Others : TOC	581 tonnes		YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.7 MAIN RIVERINE INPUTS 1990 (7) Suldalslågen.

				Total quantity of substance discharged per year		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Total volume:	6471	1000 m3/day	Cadmium *	0.00 tonnes		NO	_____ %
Minimum flow:	1322	1000 m3/day	Cadmium **	0.24 tonnes			_____ %
Maximum flow	29532	1000 m3/day	Mercury *	0.00 kg		NO	_____ %
			Mercury **	4.72 kg			_____ %
			Copper	2.93 tonnes		YES	_____ %
			Zinc	7.32 tonnes		YES	_____ %
			Lead *	0.00 tonnes		NO	_____ %
			Lead **	1.18 tonnes			_____ %
			PCBs *	0.00 kg		NO	_____ %
			PCBs **	8.27 kg			_____ %
			gamma-HCH (lindane)	8.92 kg		YES	_____ %
			Nitrates (NO3-N)	425 tonnes		YES	_____ %
			Orthophosphates (PO4-P)	1.58 tonnes		YES	_____ %
			Total N	524 tonnes		YES	_____ %
			Total P	7.56 tonnes		YES	_____ %
			Suspended Particulate Matter	1246 tonnes		YES	_____ %
			Others : TOC	tonnes		YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.8 MAIN RIVERINE INPUTS 1990 (8) Orkla.

				Total quantity of substance discharged per year	Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Total volume:	6321	1000 m3/day	Cadmium *	0.1 tonnes	NO	_____ %
Minimum flow:	1538	1000 m3/day	Cadmium **	0.3 tonnes		_____ %
Maximum flow	23017	1000 m3/day	Mercury *	1.6 kg	NO	_____ %
			Mercury **	4.9 kg		_____ %
			Copper	31.3 tonnes	YES	_____ %
			Zinc	57.0 tonnes	YES	_____ %
			Lead *	0.6 tonnes	NO	_____ %
			Lead **	1.3 tonnes		_____ %
			PCBs *	0.0 kg	NO	_____ %
			PCBs **	8.1 kg		_____ %
			gamma-HCH (lindane)	1.8 kg	YES	_____ %
			Nitrates (NO3-N)	313 tonnes	YES	_____ %
			Orthophosphates (PO4-P)	5 tonnes	YES	_____ %
			Total N	672 tonnes	YES	_____ %
			Total P	18 tonnes	YES	_____ %
			Suspended Particulate Matter	6689 tonnes	YES	_____ %
			Others : TOC	11 tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.9 MAIN RIVERINE INPUTS 1990 (9) Vefsna.

			Total quantity of substance discharged per year		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Total volume:	17789	1000 m3/day	Cadmium *	0.09 tonnes	NO	_____ %
Minimum flow:	3603	1000 m3/day	Cadmium **	0.66 tonnes		_____ %
Maximum flow	75444	1000 m3/day	Mercury *	0.94 kg	NO	_____ %
			Mercury **	13.12 kg		_____ %
			Copper	16.33 tonnes	YES	_____ %
			Zinc	33.59 tonnes	YES	_____ %
			Lead *	5.42 tonnes	NO	_____ %
			Lead **	7.42 tonnes		_____ %
			PCBs *	0.74 kg	NO	_____ %
			PCBs **	23.02 kg		_____ %
			gamma-HCH (lindane)	7.46 kg	YES	_____ %
			Nitrates (NO3-N)	505 tonnes	YES	_____ %
			Orthophosphates (PO4-P)	10.8 tonnes	YES	_____ %
			Total N	1153 tonnes	YES	_____ %
			Total P	35.3 tonnes	YES	_____ %
			Suspended Particulate Matter	21176 tonnes	YES	_____ %
			Others : TOC	tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.10 MAIN RIVERINE INPUTS 1990 (10) Altaelva.

				Total quantity of substance discharged per year		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Total volume:	6011	1000 m3/day	Cadmium *	0.06 tonnes		NO	%
Minimum flow:	2091	1000 m3/day	Cadmium **	0.23 tonnes			%
Maximum flow	25825	1000 m3/day	Mercury *	0.00 kg		NO	%
			Mercury **	4.39 kg			%
			Copper	3.64 tonnes		YES	%
			Zinc	6.62 tonnes		YES	%
			Lead *	0.00 tonnes		NO	%
			Lead **	1.10 tonnes			%
			PCBs *	0.00 kg		NO	%
			PCBs **	7.68 kg			%
			gamma-HCH (lindane)	2.01 kg		YES	%
			Nitrates (NO3-N)	86 tonnes		YES	%
			Orthophosphates (PO4-P)	4.71 tonnes		YES	%
			Total N	373 tonnes		YES	%
			Total P	18.02 tonnes		YES	%
			Suspended Particulate Matter	2365 tonnes		YES	%
			Others : TOC	tonnes		YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

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Paragraph 17: Tributary rivers ./.

Paragraph 18: Measurements of calculation used - including information on the concentration upon which the measurement is based:

Appendix VIII and IX (1-10) and Paragraph 3.2 (Report A)

Paragraph 19: Any other relevant information (e.g. proportion of substance discharged as insoluble material):

Table 5.1 The Skagerrak Region. Inputs from tributary rivers 1990 in The Subareas (1-5).

The Skagerrak region with sub-areas: (1A) Glomma, (1B) Inner Oslofj., (2) Drammenselva,
(3) Numedalslågen, (4) Skienselva, (5) Otra

Total quantity of substance discharged per year:							Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load	
Sub-areas :	1A	1B	2	3	4	5			
Substance:									
Cd *	0.00	0.09	0.00	0.00	0.00	0.00	tonnes	NO	_____ %
Cd **	0.11	0.09	0.01	0.06	0.09	1.28	tonnes		_____ %
Hg *	0.00	0.00	0.00	0.00	0.00	0.00	kg	NO	_____ %
Hg **	2.18	0.49	0.24	1.26	1.89	25.62	kg		_____ %
Cu	1.6	4.3	0.2	1.2	10.1	15.6	tonnes	YES	_____ %
Zn	4.6	10.1	1.2	5.3	18.9	116.1	tonnes	YES	_____ %
Pb *	0.00	1.56	0.00	0.09	0.00	2.21	tonnes	NO	_____ %
Pb **	0.54	1.61	0.06	0.36	0.47	6.77	tonnes		_____ %
PCBs *	0.00	0.00	0.19	0.00	0.00	0.00	kg	NO	_____ %
PCBs **	3.81	1.56	0.50	2.21	3.31	44.83	kg		_____ %
gamma-HCH	3.00	1.07	0.30	1.19	2.84	40.80	kg	YES	_____ %
NO3-N	575	302	97	580	203	2139	tonnes	YES	_____ %
PO4-P	4.5	7.8	0.7	4.0	0.9	16.2	tonnes	YES	_____ %
Total N	1211	567	120	757	363	3923	tonnes	YES	_____ %
Total P	34	33	5	23	4	85	tonnes	YES	_____ %
S.P.M.	2867	2964	338	2274	1684	12855	tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 5.2 The remaining North Sea Region. Inputs from tributary rivers 1990 in The Subareas (6-7).

The remaining Nort Sea with sub-areas (6) Orreelva, (7) Suldalslågen

Total quantity of substance discharged per year:			Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Sub-areas :	6	7		
Substance:				
Cd *	0.00	0.40	tonnes NO	%
Cd **	2.42	11.69	tonnes	%
Hg *	0.00	9.94	kg NO	%
Hg **	48.39	93.41	kg	%
Cu	40.6	60.2	tonnes YES	%
Zn	212.7	200.2	tonnes YES	%
Pb *	18.41	4.94	tonnes NO	%
Pb **	21.77	23.33	tonnes	%
PCBs *	0.00	0.00	kg NO	%
PCBs **	84.68	151.87	kg	%
gamma-HCH	83.68	140.70	kg YES	%
NO3-N	5665	4226	tonnes YES	%
PO4-P	49.3	39.7	tonnes YES	%
Total N	8524	6953	tonnes YES	%
Total P	228	206	tonnes YES	%
S.P.M.	39211	34416	tonnes YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 5.3 The Norwegian Sea Region. Inputs from tributary rivers 1990 in the Subareas (8-9).

The Norwegian Sea with sub-areas: (8) Orkla, (9) Vefsna

Total quantity of substance discharged per year:			Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Sub-areas :	8	9		
Substance:				
Cd *	0.31	1.31	tonnes NO	_____ %
Cd **	10.48	3.47	tonnes	_____ %
Hg *	0.00	0.00	kg NO	_____ %
Hg **	86.37	69.30	kg	_____ %
Cu	102.7	83.1	tonnes YES	_____ %
Zn	275.8	175.5	tonnes YES	_____ %
Pb *	0.00	0.93	tonnes NO	_____ %
Pb **	21.59	17.67	tonnes	_____ %
PCBs *	0.00	0.00	kg NO	_____ %
PCBs **	151.15	121.28	kg	_____ %
gamma-HCH	46.06	26.58	kg YES	_____ %
NO3-N	4592	1795	tonnes YES	_____ %
PO4-P	88.9	76.9	tonnes YES	_____ %
Total N	10022	5689	tonnes YES	_____ %
Total P	349	292	tonnes YES	_____ %
S.P.M.	81074	45818	tonnes YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 5.4 The Barents Region. Inputs from tributary rivers 1990 in the Subarea (10).

The Barents Sea region with sub-area: (10) Alta

Total quantity of substance discharged per year:			Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Sub-area :	10			
Substance:				
Cd *	0.00	tonnes	NO	%
Cd **	1.59	tonnes		%
Hg *	0.00	kg	NO	%
Hg **	31.87	kg		%
Cu	23.8	tonnes	YES	%
Zn	85.6	tonnes	YES	%
Pb *	11.10	tonnes	NO	%
Pb **	14.08	tonnes		%
PCBs *	0.00	kg	NO	%
PCBs **	55.77	kg		%
gamma-HCH	24.67	kg	YES	%
NO3-N	407	tonnes	YES	%
PO4-P	16.5	tonnes	YES	%
Total N	2313	tonnes	YES	%
Total P	90	tonnes	YES	%
S.P.M.	15290	tonnes	YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

APPENDIX VI : OTHER INPUTS 1990**(Paragraph 20)**

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Table 6.1 Nutrients from "Down Stream Areas" of main and tributary rivers and rivers not monitored 48

Paragraph 20: Any available information on discharge through urban run-off - storm water overflow - polder effluents etc.:

"Background" is runoff from forested areas and highlands, including effect of acid precipitation

Agriculture runoff:

- "Area" is runoff from arable land
- "Point"-sources are drainagage from silos, manures etc.

Paragraph 3.3 (Report A)

**Table 6.1 Nutrients from "Down Stream Areas" of main and tributary rivers
and rivers not monitored 1990.**

Direct runoff of P and N :

Sub-areas :		Back- ground tons	Agriculture		Sum tons
			Area tons	Point tons	
1 Glomma	Tot-P	16.4	10.0	0.6	27
	Tot-N	416.3	500.4	10.6	927
1 Inner Oslofjord	Tot-P	5.0	2.1	0.3	7
	Tot-N	101.5	96.4	3.9	202
2 Drammenselva	Tot-P	2.6	2.1	0.0	5
	Tot-N	65.6	70.6	0.3	137
3 Numedalslågen	Tot-P	6.7	9.8	0.0	17
	Tot-N	168.6	472.3	0.4	641
4 Skienselva	Tot-P	6.6	2.1	0.1	9
	Tot-N	289.8	107.3	1.5	399
5 Otra	Tot-P	6.4	4.0	0.3	11
	Tot-N	343.1	125.7	4.7	473
6 Orreelva	Tot-P	21.6	38.5	5.6	66
	Tot-N	1434.7	1229.9	69.9	2734
7 Suldalslågen	Tot-P	50.5	62.0	9.5	122
	Tot-N	4965.2	1279.9	129.7	6375
8 Orkla	Tot-P	116.5	123.7	13.0	253
	Tot-N	3835.8	3119.5	182.8	7138
9 Vefsna	Tot-P	74.8	33.3	8.2	116
	Tot-N	1870.6	836.8	111.5	2819
10 Alta	Tot-P	80.4	1.6	0.6	83
	Tot-N	1536.0	52.5	8.3	1597
			Sum P		715
			Sum N		23442

APPENDIX VII : MAIN RIVERS 1 - 10. MEASURED CONCENTRATIONS 1990

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Table 7.9	Vefsna	58
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APPENDIX VIII : TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1990

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(1)	Glomma "tributaries"	: Tista	- Hølenelva
(1)	Inner Oslo-fjord	: Årungenelva	- Åroselva
(2)	Drammenseelva "tributary"	: Lierelva	
(3)	Numedalslågen "tributaries"	: Sandeelva	- Farriselva
(4)	Skienseelva "tributary"	: Tokkeelva	
(5)	Otra "tributaries"	: Gjerstade.	- Audna
(6)	Orreelva "tributaries"	: Lygna	- Ulla
(7)	Suldalslågen "tributaries"	: Saudaelva	- Hornindalseelva
(8)	Orkla "tributaries"	: Ørstaelva	- Salsvatnelva
(9)	Vefsna "tributaries"	: Åbjøra	- Reisa
(10)	Alta "tributaries"	: Mattiselva	- Grense Jacobse.

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1990.

County	Watercourse	Runoff data										Parameters (mean values)						
		Drainage area		Discharge		Sampling station						Parameters (mean values)						
		Outlet station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1990 Normal l/s kv.km	1990 gauging station	Cond mS/m	Tot-P ug/l	PO4-P ug/l	Tot-N ug/l	NO3-N ug/l	Cu ug/l	Zn ug/l	Cd ug/l	Pb ug/l	S.P.M. mg/l		
Østfold (1.)	Tista. Iddefj.	1588	1582	14.4	14.3	14.4	14.3	5.63	13.2	1.0	825	545	1.5	4.8	<0.1	<0.5	2.1	
	Mosselva. Mossesundet	690	689	14.5	14.7	14.5	14.7	9.32	58.8	3.0	1423	285	1.5	2.9	<0.1	<0.5	3.5	
	Oslo & Akershus (1.)	Hølenelva. Drøbaksundet Ø	137	121	14.0	14.8	14.0	14.8	15.00	100.0	50.0	3000	1700	1.5	5.0	<0.1	<0.5	5.0
		Årungenelva. I. Oslofj.	52	50	13.0	13.0	13.0	13.0	15.00	30.0	10.0	300	150	1.5	5.0	<0.1	<0.5	5.0
		Gjersjøelva. I. Oslofj.	86	85	14.0	5.0	5.0	5.0	15.00	19.2	5.5	1600	1035	1.5	3.0	<0.1	<0.5	5.2
		Ljanselva. I. Oslofj.	42	41	13.0	11.8	11.8	11.8	23.00	112.0	37.0	1840	800	10.0	30.0	0.2	2.0	6.0
		Loelva/Alna. I. Oslofj.	75	69	13.0	13.5	13.5	13.5	39.00	470.0	90.0	2600	800	20.0	30.0	0.3	19.0	17.0
		Akerselva. I. Oslofj.	227	225	17.5	8.3	8.3	8.3	8.00	51.0	7.0	630	300	20.0	50.0	0.2	3.8	6.0
		Frognereelva. I. Oslofj.	23	20	15.0	23.1	23.1	23.1	17.00	113.0	53.0	1510	500	15.0	30.0	0.2	3.0	6.0
		Lysakerelva. I. Oslofj.	178	173	16.8	20.9	16.8	20.9	9.00	58.0	13.0	740	300	10.0	20.0	0.2	3.0	6.0
Sandvikselva. I. Oslofj.		223	187	18.4	20.5	18.4	20.5	13.51	26.0	9.0	1722	1335	6.0	20.0	0.2	3.0	6.0	
Åroselva. I. Oslofj.		113	109	17.0	17.0	17.0	17.0	9.50	37.3	10.0	1421	500	5.0	10.0	0.2	<0.5	6.0	
Buskerud (2.)	Lierelva. Drammensfj. Ø	309	266	18.6	14.4	18.6	17.3	19.00	38.7	6.0	990	805	1.6	10.0	<0.1	<0.5	2.8	
Vestfold (3.)	Sandeelva. Sandebukta	193	190	17.0	17.0	17.0	17.0	9.94	41.0	19.0	1490	870	2.2	20.0	<0.1	0.9	5.6	
	Aulielva. Tønsbergfj.	363	362	14.9	17.0	14.9	17.0	16.40	85.0	6.0	2180	1800	2.6	7.9	<0.1	<0.5	2.7	
	Farriselva. Larvikfj.	491	491	21.6	21.7	21.6	21.7	3.37	6.0	2.8	543	423	1.5	5.0	<0.1	<0.5	3.5	
Telemark (4.)	Tokkeelva. Kragerø	1238	1200	26.7	25.0	26.7	26.0	2.78	4.0	1.0	384	215	10.7	20.0	<0.1	<0.5	1.8	
Aust-Agder (5.)	Gjerstadelva. Søndeledfj.	419	414	27.0	31.0	29.3	32.1	3.09	5.0	1.0	413	170	1.2	20.0	<0.1	<0.5	1.1	
	Vegårdselva. Sandnesfj.	457	429	29.3	33.7	29.3	33.7	3.34	6.0	1.0	413	183	1.2	20.0	<0.1	<0.5	1.4	
	Nidelva. Arendal	4025	4020	29.3	35.6	29.8	36.3	1.73	6.0	1.0	254	146	1.1	9.4	<0.1	<0.5	1.4	

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1990.

County	Watercourse	Runoff data										Parameters (mean values)									
		Drainage area		Discharge		Sampling station		gauging station		Cond mS/m	Tot-P ug/l	PO4-P ug/l	Tot-N ug/l	NO3-N ug/l	Cu ug/l	Zn ug/l	Cd ug/l	Pb ug/l	S.P.M. mg/l		
		Outlet station kv.km	Drainage station kv.km	Normal 1990 l/s kv.km	Disch. station kv.km	Normal 1990 l/s kv.km	1990 l/s kv.km	1990 l/s kv.km													
Vest-Agder (5.) (6.)	Tovdalselva. Topdalsfj.	1856	1854	1794	1794	32.8	42.5	33.9	43.9	3.77	5.8	1.9	279	96	1.0	6.0	<0.1	<0.5	0.8		
	Søgneelva. Flekkerøy	204	192	192	192	38.0	51.7	38.0	51.7	9.40	11.0	1.5	816	610	1.2	7.0	<0.1	<0.5	1.0		
	Mandalselva. Mannefj.	1809	1800	1740	1740	46.0	64.8	47.6	67.0	2.46	7.0	1.0	326	181	1.5	8.1	<0.1	0.6	0.6		
	Audna. Sniksfj.	450	400	59	59	45.2	75.9	51.8	87.0	7.60	9.5	2.0	286	243	1.3	10.0	<0.1	<0.5	1.0		
	Lygna. Lyngdalsfj.	664	660	266	266	53.4	93.5	57.9	98.1	5.44	12.0	2.0	368	200	1.3	16.9	<0.1	1.2	3.8		
	Kvina. Fedafj.	1445	1140	1140	1140	57.6	97.9	57.6	97.9	2.00	6.0	1.0	175	100	1.3	10.0	<0.1	1.0	2.0		
	Sira. Åna-Sira	1916	1872	1872	1872	59.4	98.0	59.4	98.0	2.20	4.5	1.0	220	126	1.3	10.0	<0.1	1.0	2.0		
	Rogaland (6.)	Sokndalselva. Sogndalsstr.	294	293	107	107	51.1	76.7	51.1	76.7	4.00	12.0	3.0	327	190	2.0	10.0	<0.1	1.0	0.8	
		Hellelandselva. Egersund	241	240	194	194	57.5	89.1	71.1	110.2	4.01	11.0	1.0	434	315	3.9	12.5	<0.1	1.2	0.8	
		Bjerkreimselva. Egersund	705	704	633	633	77.7	124.3	86.4	138.2	4.01	11.0	1.0	434	315	3.9	12.5	<0.1	1.2	0.8	
		Håelva. Håtangen	165	160	135	135	39.6	51.2	46.9	60.7	13.30	103.0	25.0	2025	1000	1.5	4.0	<0.1	1.0	4.0	
		Figgjo. Solavika	229	218	135	135	50.0	75.0	50.0	75.0	10.20	70.0	26.0	1700	1200	2.5	4.0	<0.1	0.5	5.0	
		Ims-Lutsi. Høgsvfj. Boknafj.	127	117	129	129	75.6	107.4	83.4	118.4	7.60	10.0	2.6	750	580	1.8	2.0	<0.1	0.5	3.0	
		Oltedalse..Høgsvfj. Boknafj.	102	101	129	129	65.3	90.1	83.4	115.1	5.00	54.0	8.0	560	260	1.8	4.0	<0.1	1.0	3.0	
Dirdalse..Høgsvfj. Boknafj.		158	158	95	95	84.0	126.0	84.0	126.0	2.40	3.0	1.0	310	180	3.7	8.1	<0.1	1.5	2.0		
Fraforde..Frafj. Boknafj.		178	178	124	124	94.4	141.6	94.4	141.6	2.50	4.0	1.0	310	200	1.0	4.0	<0.1	<0.5	0.5		
Espedalse..Høgsvfj. Boknafj.		138	138	124	124	94.4	141.6	94.4	141.6	2.50	4.0	1.0	310	200	1.0	4.0	<0.1	<0.5	0.5		
Lysee.. Lysefj. Boknafj.		182	182	46	46	74.0	137.6	74.0	137.6	2.50	4.0	1.0	310	200	1.0	4.0	<0.1	<0.5	0.5		
Årdalse..Årdalsfj. Boknafj.		519	516	501	501	81.4	118.0	81.4	118.0	2.50	4.0	1.0	356	310	0.6	3.9	<0.1	<0.5	0.3		
Førree.. Jøsenfj. Boknafj.		163	163	163	163	85.8	151.0	85.8	151.0	2.50	4.0	1.0	300	250	1.0	4.0	<0.1	<0.5	0.5		
Ulla. Jøsenfj. Boknafj.		393	393	385	385	83.4	146.8	83.4	146.8	2.50	4.0	1.0	300	250	1.0	4.0	<0.1	<0.5	0.5		
Saudae.. Saudafj. Boknafj.	353	353	353	353	85.0	136.0	85.0	136.0	2.50	3.0	1.0	280	220	1.0	3.0	<0.1	<0.5	0.5			
Åbøelva. Saudafj. Boknafj.	82	82	82	82	85.0	136.0	85.0	136.0	2.50	3.0	1.0	280	220	1.0	3.0	<0.1	<0.5	0.5			
Vikedalse.. Boknafj.	118	117	80.0	80.0	80.0	108.0	80.0	108.0	2.97	8.0	1.0	320	245	0.7	4.4	<0.1	<0.5	1.1			

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1990.

County	Watercourse	Runoff data										Parameters (mean values)									
		Drainage area		Discharge		Sampling station		Discharge gauging station		Cond mS/m	Tot-P ug/l	PO4-P ug/l	Tot-N ug/l	NO3-N ug/l	Cu ug/l	Zn ug/l	Cd ug/l	Pb ug/l	S.P.M. mg/l		
		Outlet station kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1990 Normal l/s kv.km	1990 gauging station kv.km														
Hordaland (7.)	Etneelva. Etnefj. Bømlafj.	252	250	127	48.8	73.8	96.0	145.2	2.66	7.0	1.0	302	230	0.8	4.9	<0.1	<0.5	1.0			
	Opo. Sørfj. Hardangerfj.	482	480	464	76.7	109.4	79.3	113.2	1.52	5.0	1.0	189	140	0.9	6.7	<0.1	<0.5	0.6			
	Tysso. Sørfj. Hardangerfj.	388	385	407	79.3	81.2	79.3	77.4	1.52	4.0	1.0	141	110	0.8	5.3	<0.1	<0.5	0.2			
	Kinso. Sørfj. Hardangerfj.	281	281	232	38.0	65.9	46.0	80.9	1.50	3.0	1.0	150	100	0.8	5.0	<0.1	<0.5	0.5			
	Veig. Eidfjv. Hardangerfj.	496	496	386	41.8	40.6	41.8	52.6	2.40	1.6	1.3	174	60	1.0	5.0	<0.1	<0.5	0.5			
	Bjoreia. " . Hardangerfj.	592	592	592	26.0	28.1	26.0	28.1	2.40	2.5	1.6	294	170	1.0	5.0	<0.1	<0.5	0.5			
	Sima. Eidfj. Hardangerfj.	145	145	128	66.1	125.6	69.2	131.5	2.20	2.5	1.8	215	130	1.0	5.0	<0.1	<0.5	0.5			
	Austdøla. Osafj. Eidfj.	131	130	89	70.0	116.2	74.6	123.8	1.79	8.0	3.0	188	145	1.0	5.0	<0.1	<0.5	0.5			
	Norrdøla. Osafj. Eidfj.	40	39	89	70.0	116.2	74.6	123.8	3.91	8.0	3.0	229	211	1.0	5.0	<0.1	<0.5	0.5			
	Modalselva. Fusafj.	240	240	50	85.0	136.0	85.0	136.0	1.76	5.0	1.0	194	123	3.1	9.6	<0.1	0.6	0.6			
	Oselva. Fusafj.	109	108	50	80.0	46.7	91.7	100.8	3.85	11.0	7.0	340	160	0.9	10.0	<0.1	<0.5	1.0			
	Bergdalse. Veafj. Herdlafj	198	198	1102	80.0	128.0	80.0	128.0	2.66	5.0	1.0	153	96	0.7	3.9	<0.1	<0.5	0.7			
	Vosso. Veafj. Sørfj.	1492	1465	342	42.5	80.3	58.2	106.8	1.55	5.0	1.0	200	117	1.1	9.7	<0.1	<0.5	0.7			
	Ekso. Osterfj.	414	400	248	86.2	122.4	86.2	122.4	1.01	3.0	0.5	102	55	1.0	8.0	<0.1	<0.5	0.7			
	Modalselva. Osterfj.	385	384	248	95.5	135.6	95.5	135.6	0.80	3.0	1.0	105	70	1.0	5.0	<0.1	<0.5	0.5			

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1990.

County	Watercourse	Runoff data										Parameters (mean values)									
		Drainage area		Discharge		Sampling station		gauging station		Cond mS/m	Tot-P ug/l	PO4-P ug/l	Tot-N ug/l	NO3-N ug/l	Cu ug/l	Zn ug/l	Cd ug/l	Pb ug/l	S.P.M. mg/l		
		Outlet station kv.km	Disch. gaug. station kv.km	Normal 1/s kv.km	1990 Normal 1/s kv.km	Normal 1/s kv.km	1990 Normal 1/s kv.km														
Sogn og Fjordane (7.)	Nærøye.. Aurl.fj. Sognefj.	290	267	59.5	113.6	59.5	113.6	1.00	3.0	0.5	87	57	1.6	2.4	<0.1	1.0	0.8				
	Flåmse.. Aurl.fj. Sognefj.	280	275	52.4	92.2	52.4	92.2	1.00	3.0	0.5	100	50	1.5	2.5	<0.1	<0.5	0.5				
	Aurlandv.Aurl.fj. Sognefj.	800	762	48.6	85.5	48.6	85.5	1.71	4.0	0.5	171	136	0.8	2.2	<0.1	<0.5	0.1				
	Erdalse. Lærd.fj. Sognefj.	138	138	30.0	53.4	30.0	53.4	1.11	4.0	0.5	111	76	1.1	2.8	<0.1	<0.5	0.5				
	Lærdalsv.Lærd.fj. Sognefj.	1184	1172	30.0	53.4	30.0	53.4	1.28	6.0	1.0	99	62	2.7	2.5	<0.1	<0.5	1.5				
	Årdalsv. Årdalsfj. Sognefj.	989	989	44.9	64.8	44.9	64.8	1.28	3.3	1.0	205	93	3.0	5.0	0.2	1.0	2.0				
	Fortunv. Lusterfj. Sognefj.	508	367	51.0	76.5	51.0	76.5	1.77	4.0	0.5	123	75	2.2	4.5	<0.5	<0.5	0.8				
	Mørkrivv. Lusterfj. Sognefj.	282	203	52.0	85.8	54.7	85.8	1.77	4.0	0.5	123	75	2.2	4.5	<0.5	<0.5	0.8				
	Jostedøla. " Sognefj.	865	573	63.0	113.4	68.0	122.4	1.77	4.0	0.5	123	75	2.2	4.5	<0.5	<0.5	0.8				
	Årøye.. Sognd.fj. Sognefj.	449	446	66.5	125.0	77.2	143.1	1.77	4.0	0.5	123	75	2.2	4.5	<0.5	<0.5	0.8				
	Sogndalse. " Sognefj.	175	111	48.0	77.3	66.1	106.4	1.36	6.0	1.0	111	58	2.6	2.4	<0.5	<0.5	1.0				
	Gaular. Dalsfj. Bufj.	627	625	75.0	131.3	79.3	138.8	1.76	6.0	1.0	135	72	1.2	3.6	<0.5	<0.5	0.8				
	Jølstra. Førdefj.	714	709	70.6	113.0	74.3	118.9	2.19	9.0	1.0	165	76	0.9	4.8	<0.5	0.5	0.8				
	Nausta. Førdefj.	277	273	81.7	134.8	81.7	134.8	1.25	5.0	1.0	93	50	0.7	2.4	<0.5	<0.5	0.9				
	Oselva. Høydalsfj.	287	285	78.7	132.2	78.7	132.2	1.82	4.5	1.0	160	20	0.5	2.0	<0.5	<0.5	1.0				
	Hopse.. Høyfj. Nordfj.S	73	161	75.0	131.2	75.0	131.2	1.33	4.0	0.5	87	44	0.7	1.6	<0.5	<0.5	0.4				
	Gjengedalse.. Nordfj.S	170	168	75.0	131.2	75.0	131.2	1.33	4.0	0.5	87	44	0.7	1.6	<0.5	<0.5	0.4				
	Breimse.. Gloppenfj. "	636	634	68.0	107.4	68.8	108.7	2.02	7.0	1.0	194	121	0.7	1.4	<0.5	<0.5	1.3				
	Oldene.. Indre Nordfj.	226	225	70.1	119.2	70.1	119.2	1.48	5.0	1.0	224	164	1.2	1.2	<0.5	<0.5	1.2				
	Loelva. Indre Nordfj.	261	260	65.0	110.5	65.0	110.5	1.53	4.0	1.0	220	160	1.0	1.0	<0.5	<0.5	1.0				
Strynee.. Indre Nordfj.	532	530	60.2	105.4	60.2	105.4	2.03	5.0	1.0	165	102	1.4	2.0	<0.5	<0.5	1.4					
Hornindalse.. Nordfj. N	428	424	58.1	97.6	58.1	97.6	2.23	3.0	0.5	147	80	1.0	4.1	<0.5	<0.5	0.6					

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1990.

County	Watercourse	Runoff data										Parameters (mean values)							
		Drainage area		Discharge		Sampling station		Discharge gauging station		Cond mS/m	Tot-P ug/l	PO4-P ug/l	Tot-N ug/l	NO3-N ug/l	Cu ug/l	Zn ug/l	Cd ug/l	Pb ug/l	S.P.M. mg/l
		Outlet kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1990 l/s kv.km	Normal l/s kv.km	1990 l/s kv.km											
Møre og Romsdal (8.)	Ørsta.. Ørsta fj.	160	155		70.0	108.5	70.0	108.5	1.87	4.0	0.5	75	29	1.7	2.4	<0.5	<0.5	0.5	
	Valldøla, Nordalfj., Storfj.	359	357		60.0	66.0	60.0	66.0	1.12	4.0	0.5	57	34	1.5	1.9	<0.5	<0.5	1.0	
	Rauma, Romsdalsf., Moldefj.	1202	1190	1142	32.8	35.0	32.8	35.0	1.46	5.0	1.0	194	135	0.8	3.5	<0.5	<0.5	1.3	
	Isa, Isfj., Moldefj.	175	175	89	50.0	53.5	57.0	61.0	1.50	4.0	1.0	180	120	1.0	3.0	<0.5	<0.5	1.0	
	Eira, Eresfj., Moldefj.	1119	1119	1085	34.8	40.0	34.8	40.0	1.50	4.0	1.0	180	120	1.0	2.0	<0.5	<0.5	1.0	
	Littlelalse.. Sundalsfj.	359	330	330	41.0	42.2	41.0	42.2	1.50	2.6	1.0	174	135	1.5	2.0	<0.5	<0.5	1.0	
	Driva.. Sundfj., Tingvollfj.	2487	2435	2435	27.9	30.0	27.9	30.0	1.50	8.2	2.3	190	106	1.5	2.0	<0.5	<0.5	1.0	
	Ulva.. Ålvundfj.	199	199	207	57.0	62.7	60.7	66.7	1.50	5.0	1.0	180	120	1.0	2.0	<0.5	<0.5	1.0	
	Toåa, Todalsfj.	251	251	207	58.5	58.5	58.5	58.5	1.50	5.0	1.0	180	120	1.0	2.0	<0.5	<0.5	1.0	
	Surna, Surnadalsfj.	1200	1200	1125	48.0	57.6	49.3	59.2	2.62	8.1	2.0	231	78	1.0	2.0	<0.5	<0.5	1.0	
	Bøvra, Hammesfj., Halsafj.	243	243	196	55.0	66.0	55.0	66.0	2.00	5.0	1.0	200	100	1.0	2.0	<0.5	<0.5	1.0	
	Sør-Trøndelag (8.)	Børse.. Gaulosen Tr.h.fj.	110	100		30.0	36.0	30.0	36.0	8.33	30.0	1.6	830	400	1.0	5.0	<0.1	<0.5	2.0
Vigda, Gaulosen Tr.h.fj.		150	150		30.0	36.0	30.0	36.0	8.00	30.0	5.0	850	400	1.0	5.0	<0.1	<0.5	2.0	
Gaula, Gaulosen Tr.h.fj.		3659	3650	3062	26.4	27.2	26.4	27.2	5.15	14.8	5.0	284	133	6.5	20.0	0.1	<0.5	2.0	
Nidelva, Trondheimsfj.		3110	3100	3049	35.5	38.3	35.5	38.3	5.00	15.0	5.0	300	150	1.0	5.0	<0.1	<0.5	2.0	
Homla, Stjørd.fj., Tr.h.fj.		157	157		30.0	32.4	30.0	32.4	5.00	10.0	3.0	300	150	1.0	5.0	<0.1	<0.5	2.0	
Stjørdalsv. " Tr.h.fj.		2117	2117	1863	38.5	40.8	38.5	40.8	4.00	8.0	2.0	300	150	1.0	5.0	<0.1	<0.5	2.0	
Nord-Trøndelag (8.)	Gråe.. " Tr.h.fj.	93	93		25.0	27.0	25.0	27.0	5.00	10.0	3.0	300	150	1.0	5.0	<0.1	<0.5	2.0	
	Verdalsvassdr., Tr.h.fj.	1472	1472	898	40.0	44.4	44.5	49.4	5.00	8.0	2.0	300	150	1.0	5.0	<0.1	<0.5	2.0	
	Figga/Leksdalse., Tr.h.fj.	282	282	178	30.0	30.9	33.6	34.6	4.60	8.5	1.0	401	150	1.0	5.0	<0.1	<0.5	2.0	
	Snåsavassdr., Trondh.fj.	2153	2125	2125	35.1	42.1	35.1	42.1	3.80	4.9	1.2	245	96	0.6	5.0	<0.1	<0.5	5.0	
	Årgårdselva, Namsfj.	543	510	238	43.0	53.3	50.9	62.6	8.40	28.0	10.0	338	200	1.0	5.0	<0.1	<0.5	5.0	
	Namsen, Namsfj., Ø	6277	6276	5718	44.0	54.1	43.4	53.4	2.82	6.4	1.0	205	55	4.8	10.1	<0.1	<0.5	2.0	
Salsvatnelva, Follafj.	432	432	422	59.7	69.3	59.7	69.3	5.00	5.0	1.0	200	60	1.0	5.0	<0.1	<0.5	0.5		

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1990.

County	Watercourse	Runoff data						Parameters (mean values)											
		Drainage area		Discharge		Sampling station		gauging station		Cond mS/m	Tot-P ug/l	PO4-P ug/l	Tot-N ug/l	NO3-N ug/l	Cu ug/l	Zn ug/l	Cd ug/l	Pb ug/l	S.P.M. mg/l
		Outlet station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1990 l/s kv.km	Normal l/s kv.km	1990 l/s kv.km												
Nordland (9.)	Åbjøra. Bindalsfj. S	526	520	384	80.0	107.2	80.2	107.5	5.95	3.2	1.0	175	50	1.0	5.0	<0.1	<0.5	1.0	
	Skjerva. Vefsenfj. S	104	104	98	41.3	50.8	41.3	50.8	5.03	12.6	3.0	341	100	1.0	5.0	<0.1	<0.5	2.0	
	Fusta. Vefsenfj. N	544	543	520	63.4	79.9	63.4	79.9	3.79	5.4	1.0	226	100	1.0	5.0	<0.1	<0.5	1.5	
	Drevja. Vefsenfj. N	177	176	98	65.0	81.9	65.0	81.9	6.30	17.9	5.0	189	80	1.0	5.0	<0.1	<0.5	2.0	
	Røssåga. Sørffj.	2092	2087	1880	45.4	58.6	45.4	58.6	4.77	9.4	2.0	147	50	2.5	5.0	0.1	<0.5	1.5	
	Bjerka. Sørffj.	385	385	273	55.0	71.5	55.4	72.0	4.00	5.0	1.0	150	60	2.0	5.0	<0.1	<0.5	1.5	
	Dalselva. Ranafj. N	211	211	129	38.0	41.8	39.5	43.4	4.00	5.0	1.0	150	60	2.0	5.0	<0.1	<0.5	1.5	
	Ranavassdraget. Ranafj. N	3847	3846	1892	51.3	66.7	44.9	63.3	3.53	4.9	1.0	197	60	2.5	5.0	0.1	<0.5	1.5	
	Fykanåga. Glomfjord	297	297	243	100.0	116.0	103.7	120.3	3.32	2.0	1.0	89	68	2.0	5.0	<0.1	<0.5	1.5	
	Beiare..Beiarfj. Nordfj.	1064	875	797	45.1	49.6	45.1	49.6	4.77	9.2	5.2	121	67	2.0	5.0	<0.1	<0.5	2.0	
	Saltalvassdr..Saltfj.S	1544	1543	1168	30.6	33.7	32.1	35.1	3.60	25.6	6.0	167	60	2.0	5.0	<0.1	<0.5	2.0	
	Sulijelmavassdr..Saltfj	1028	800	791	43.8	46.0	44.3	46.5	3.87	4.3	1.0	139	60	22.0	28.7	0.1	0.8	2.0	
	Kobbe. Leirfj. Sørfolda N	405	405	383	66.9	70.2	66.9	70.2	1.56	9.0	2.0	120	30	2.0	5.0	<0.1	<0.5	0.5	
	Skjoma. Ofotfj. S	845	840	797	36.3	42.1	36.3	42.1	1.34	3.0	1.0	60	18	1.0	5.0	<0.1	<0.5	0.5	

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1990.

County	Watercourse	Runoff data																	
		Drainage area		Discharge		Parameters (mean values)													
		Outlet station kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Sampling station Normal 1/s kv.km	gauging station Normal 1/s kv.km	1990 Cond mS/m	Tot-P ug/l	PO4-P ug/l	Tot-N ug/l	NO3-N ug/l	Cu ug/l	Zn ug/l	Cd ug/l	Pb ug/l	S.P.M. mg/l			
Troms (9.)	Spanselva. Astafj. Vågsfj.	142	142	533	50.0	57.5	50.0	57.5	8.40	6.0	2.0	150	60	1.0	2.0	<0.1	<0.5	0.5	
	Salangse.. Astafj. Vågsfj.	539	539	533	40.9	45.0	40.9	45.0	8.40	6.9	2.3	156	62	1.0	2.0	<0.1	<0.5	1.0	
	Rossfjorde.. Malangen	196	190		39.5	42.7	39.5	42.7	690.00	10.9	3.0	198	26	1.0	2.0	<0.1	<0.5	1.0	
	Målse.. Målselvf. "	3239	3200	3118	28.7	31.6	28.7	31.6	5.80	13.9	3.3	180	47	1.0	3.0	<0.1	<0.5	1.0	
	Bardue.. Målseiva	2906	2906	2049	28.3	32.5	28.3	32.5	6.40	14.0	5.0	180	36	1.0	3.0	<0.1	<0.5	1.0	
	Nordkjoseiva. Balsfj.	191	191	415	25.0	31.3	27.7	34.6	6.00	10.0	3.0	150	25	1.0	3.0	<0.1	<0.5	1.0	
	Signadalseiva. Lyngen V	473	467	415	27.7	33.2	27.7	33.2	3.73	5.0	1.0	130	20	1.0	2.0	<0.1	<0.5	1.0	
	Skibotnelva. Lyngen	770	770	724	18.0	21.6	18.0	21.6	3.50	5.0	1.0	130	20	1.0	2.0	<0.1	<0.5	0.5	
	Kåfjordeiva. Lyngen Ø	358	358	348	20.0	23.0	20.0	23.0	3.00	6.0	1.0	130	20	1.0	2.0	<0.1	<0.5	1.0	
	Reisa. Reisafj.	2702	2702		16.0	19.2	16.0	19.2	3.00	6.0	1.0	130	20	1.0	2.0	<0.1	<0.5	1.0	
	Finnmark (10.)	Mattiselva. Kåfj. Altafj.	325	325	319	26.5	27.8	26.5	27.8	3.50	5.0	1.0	100	20	1.0	2.0	<0.1	<0.5	0.5
		Tverrelva. Altafj.	234	233	233	15.1	15.1	15.1	15.1	4.30	7.9	1.8	230	54	2.0	3.0	<0.1	<0.5	1.0
		Repparfjordv.. Repparfj.	1090	1089		25.0	29.3	25.0	29.3	4.85	2.0	1.0	120	40	1.0	2.0	<0.1	<0.5	0.5
		Stabburse.. I. Porsangen V	1108	1102	870	18.3	14.1	18.3	14.1	3.49	3.0	1.0	180	20	1.0	2.0	<0.1	<0.5	1.0
Lakse.. Indre Porsangen S		1533	1532	941	15.9	12.2	15.9	12.2	6.40	4.0	1.0	100	5	1.0	2.0	<0.1	<0.5	1.0	
Børselva. Indre Porsangen Ø		883	883	863	29.8	29.8	29.8	29.8	6.00	5.0	1.0	100	10	1.0	2.0	<0.1	<0.5	1.0	
Mattusjåkka. I. Laksefj. V		101	101	101	22.8	20.3	22.8	20.3	6.00	5.0	1.0	100	10	1.0	2.0	<0.1	<0.5	1.0	
Storelva. Indre Laksefj. V		690	690	760	21.9	19.5	19.9	17.7	6.00	5.0	1.0	100	10	1.0	2.0	<0.1	<0.5	1.0	
Soussjåkka. I. Laksefj. V		92	92	102	25.3	23.2	22.8	21.0	5.50	5.0	1.0	100	10	1.0	2.0	<0.1	<0.5	1.0	
Adamselva. I. Laksefj. Ø		705	705	760	19.9	17.7	19.9	17.7	5.00	5.0	1.0	100	10	1.0	2.0	<0.1	<0.5	1.0	
Tanavassdraget. Tanafj. S	16389	15713	14169	11.5	10.4	11.5	10.4	5.10	5.9	1.0	146	34	1.0	2.5	<0.1	1.5	1.0		
Vesterelva. Syltrefj.	469	469	79	34.6	30.8	34.6	30.8	5.00	5.0	1.0	150	20	1.0	2.0	<0.1	<0.5	1.0		
V. Jakobse.. Y. Varangerfj.	627	627	239	18.1	16.1	18.1	16.1	5.00	6.0	1.0	150	20	1.0	2.0	<0.1	<0.5	1.0		
Passvike..Bøkfj. Varang.fj.	18404	18400	18175	9.3	8.3	9.3	8.3	4.17	6.8	1.1	167	24	2.4	12.0	<0.1	0.7	1.0		
Neiden. Munkfj. Varang.fj.	2960	2960	2911	9.8	8.8	9.8	8.8	4.20	6.0	1.0	150	20	2.0	5.0	<0.1	<0.5	1.0		
Grense. Jakobsse.. Varang.fj.	234	234		18.0	14.8	18.0	14.8	4.91	5.0	1.0	155	16	2.3	5.6	<0.1	<0.5	1.0		

Table 8.2

APPENDIX IX : TRIBUTARY RIVERS. ANNUAL LOAD 1990

Page:

Table 9.1 Cond., Nutrients, Heavy metals, Suspended part.matter 77-83

Table 9.2 Mercury, Lindane, PCBs *(Detection limit = limit) 85-91

- (1) Glomma "tributaries" : Tista - Hølenelva
- (1) Inner Oslo-fjord : Årungenelva - Åroselva
- (2) Drammenselva "tributary" : Lierelva
- (3) Numedalslågen "tributaries" : Sandeelva - Farriselva
- (4) Skienselva "tributary" : Tokkeelva
- (5) Otra "tributaries" : Gjerstade. - Audna
- (6) Orreelva "tributaries" : Lygna - Ulla
- (7) Suldalslågen "tributaries": Saudaelva - Hornindalselva
- (8) Orkla "tributaries" : Ørstaelva - Salsvatnelva
- (9) Vefsna "tributaries" : Åbjøra - Reisa
- (10) Alta "tributaries" : Mattiselva - Grense Jacobse.

* Measurements below detection limits are treated in two ways: "Detection limit = Zero", and "Detection limit = limit". This concerns the substances Cd, Pb, Hg and PCBs. In Tables 9.1-9.2 it is chosen to present the limit-values, but in Tables 5.1-5.4 both "zero- and limit-values" are shown.

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1990 (Detection limit = limit).

County	Watercourse	Runoff data																			
		Drainage area		Discharge				Parameters (mean values)													
		Outlet station kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1990 Normal l/s kv.km	1990 gauging station l/s kv.km	Cond mS/m	Tot-P tons	PO4-P tons	Tot-N tons	NO3-N tons	Cu tons	Zn tons	Cd tons	Pb tons	S.P.M. t.tons				
Østfold (1.)	Tista. Iddefj.	1588	1582	1582	14.4	14.3	14.4	14.3	14.3	14.3	14.3	5.63	9.4	0.7	589	389	1.07	3.42	0.07	0.36	1.48
	Mosselva. Mossesundet	687	686	686	14.5	14.7	14.5	14.7	14.5	14.7	14.7	9.32	18.7	1.0	453	91	0.48	0.92	0.03	0.16	1.10
	Hølenelva. Drøbakundet Ø	137	121		14.0	14.8						15.00	5.6	2.8	169	96	0.08	0.28	0.01	0.03	0.28
	Årungenelva. I. Oslofj.	52	50		13.0	13.0						15.00	0.6	0.2	6	3	0.03	0.10	0.00	0.01	0.10
	Gjersjøelva. I. Oslofj.	86	85	85	14.0	5.0		5.0				15.00	0.3	0.1	21	14	0.02	0.04	0.00	0.01	0.07
	Ljanselva. I. Oslofj.	42	41	41	13.0	11.8		11.8				23.00	1.7	0.6	28	12	0.15	0.46	0.00	0.03	0.09
	Loelva/Alna. I. Oslofj.	75	69	69	13.0	13.5		13.5				39.00	13.8	2.6	76	24	0.59	0.88	0.01	0.56	0.50
	Akerselva. I. Oslofj.	227	225	225	17.5	8.3		8.3				8.00	3.0	0.4	37	18	1.18	2.94	0.01	0.22	0.35
	Frognerelva. I. Oslofj.	23	20	20	15.0	23.1		23.1				17.00	1.6	0.8	22	7	0.22	0.44	0.00	0.04	0.09
	Lysakerelva. I. Oslofj.	178	173	173	16.8	20.9		16.8				9.00	6.6	1.5	84	34	1.14	2.28	0.02	0.34	0.68
Buskerud (2.)	Sandvikselva. I. Oslofj.	223	187	187	18.4	20.5		18.4			13.51	3.1	1.1	208	161	0.73	2.42	0.02	0.36	0.73	
	Åroselva. I. Oslofj.	113	109	109	17.0	17.0		17.0			9.50	2.2	0.6	83	29	0.29	0.58	0.01	0.03	0.35	
	Lierelva. Drammensfj. Ø	309	266	222	18.6	14.4		18.6			17.3	4.7	0.7	120	97	0.19	1.21	0.01	0.06	0.34	
Vestfold (3.)	Sandeelva. Sandebukta	193	190		17.0	17.0		17.0			9.94	4.2	1.9	152	89	0.22	2.04	0.01	0.09	0.57	
	Aulielva. Tønsbergfj.	363	362	362	14.9	17.0		14.9			16.40	16.5	1.2	423	349	0.50	1.53	0.02	0.10	0.53	
	Farriselva. Larvikfj.	491	491	491	21.6	21.7		21.6			3.37	2.0	0.9	182	142	0.50	1.68	0.03	0.17	1.18	
Telemark (4.)	Tokkeelva. Kragerø	1238	1200	1200	26.7	25.0		26.7			2.78	3.8	0.9	363	203	10.12	18.92	0.09	0.47	1.68	
	Gjerstadelva. Søndeledfj.	419	414	291	27.0	31.0		29.3			3.09	2.0	0.4	167	69	0.49	8.09	0.04	0.20	0.44	
Aust-Agder (5.)	Vegårdselva. Sandnesfj.	457	429	291	29.3	33.7		29.3			3.34	2.7	0.5	188	83	0.55	9.12	0.05	0.23	0.63	
	Nidelva. Arendal	4025	4020	3956	29.3	35.6		29.8			1.73	27.1	4.5	1146	659	4.96	42.42	0.45	2.26	6.32	

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1990 (Detection limit = limit).

County	Watercourse	Runoff data										Parameters (mean values)																																		
		Drainage area					Discharge					Tot-P					NO3-N					Cu					Zn					Cd					Pb					S.P.M.				
		Outlet kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal 1990 l/s kv.km	Sampling station 1990 l/s kv.km	Normal 1990 l/s kv.km	gauging station 1990 l/s kv.km	Cond mS/m	Tot-P tons	PO4-P tons	Tot-N tons	NO3-N tons	Cu tons	Zn tons	Cd tons	Pb tons	S.P.M. t.tons																												
Vest-Agder (5.)	Tovdalselva, Topdalsfj.	1856	1854	1794	32.8	42.5	33.9	43.9	3.77	14.4	4.7	693	239	2.48	14.91	0.25	1.24	1.99																												
	Søgneelva, Flekkerøy	204	192	192	38.0	51.7	38.0	51.7	9.40	3.4	0.5	255	191	0.38	2.19	0.03	0.16	0.31																												
	Mandalselva, Mannefj.	1809	1800	1740	46.0	64.8	47.6	67.0	2.46	25.7	3.7	1199	666	5.52	29.79	0.37	2.21	2.21																												
	Audna, Sniksfj.	450	400	59	45.2	75.9	51.8	87.0	7.60	9.1	1.9	274	233	1.24	9.57	0.10	0.48	0.96																												
	Lygna, Lyngdalsfj.	664	660	266	53.4	93.5	57.9	98.1	5.44	23.4	3.9	716	389	2.53	32.89	0.19	2.34	7.40																												
	Kvina, Fedafj.	1445	1140	1140	57.6	97.9	57.6	97.9	2.00	21.1	3.5	616	352	4.58	35.20	0.35	3.52	7.04																												
	Sira, Ana-Sira	1916	1872	1872	59.4	98.0	59.4	98.0	2.20	26.0	5.8	1273	729	7.52	57.85	0.58	5.79	11.57																												
	Rogaland (6.)	Sokndalselva, Sogndalsstr.	294	293	107	51.1	76.7	51.1	76.7	4.00	8.5	2.1	232	135	1.42	7.09	0.07	0.71	0.57																											
		Hellelandselva, Egersund	241	240	194	57.5	89.1	71.1	110.2	4.01	7.4	0.7	293	212	2.63	8.43	0.07	0.81	0.54																											
		Bjerkreimselva, Egersund	705	704	633	77.7	124.3	86.4	138.2	4.01	30.4	2.8	1198	869	10.76	34.50	0.28	3.31	2.21																											
Håelva, Håtangen		165	160	135	39.6	51.2	46.9	60.7	13.30	26.6	6.5	523	258	0.39	1.03	0.03	0.26	1.03																												
Figgjo, Solavika		229	218	135	50.0	75.0	50.0	75.0	10.20	36.1	13.4	877	619	1.29	2.06	0.05	0.26	2.58																												
Ims-Lutsi, Høgsvfj, Boknafj.		127	117	129	75.6	107.4	83.4	118.4	7.60	4.0	1.0	297	230	0.71	0.79	0.04	0.20	1.19																												
Oltedalse..Høgsvfj, Boknafj.		102	101	129	65.3	90.1	83.4	115.1	5.00	15.5	2.3	161	75	0.52	1.15	0.03	0.29	0.86																												
Dirdalse..Høgsvfj, Boknafj.		158	158	95	84.0	126.0	84.0	126.0	2.40	1.9	0.6	195	113	2.32	5.09	0.06	0.94	1.26																												
Frafordde..Frafj, Boknafj.		178	178	124	94.4	141.6	94.4	141.6	2.50	3.2	0.8	246	159	0.79	3.18	0.08	0.40	0.40																												
Espedalse..Høgsvfj, Boknafj.		138	138	124	94.4	141.6	94.4	141.6	2.50	2.5	0.6	191	123	0.62	2.46	0.06	0.31	0.31																												
(7.)	Lysee.. Lysefj, Boknafj.	182	182	46	74.0	137.6	74.0	137.6	2.50	3.2	0.8	245	158	0.79	3.16	0.08	0.39	0.39																												
	Årdalse..Årdalsfj, Boknafj.	519	516	501	81.4	118.0	81.4	118.0	2.50	7.7	1.9	684	595	1.15	7.49	0.19	0.96	0.58																												
	Førree.. Jøsenfj, Boknafj.	163	163	163	85.8	151.0	85.8	151.0	2.50	3.1	0.8	233	194	0.78	3.10	0.08	0.39	0.39																												
	Ulla, Jøsenfj, Boknafj.	393	393	385	83.4	146.8	83.4	146.8	2.50	7.3	1.8	546	455	1.82	7.28	0.18	0.91	0.91																												
	Saudae.. Saudafj, Boknafj.	353	353	353	85.0	136.0	85.0	136.0	2.50	4.5	1.5	424	333	1.51	4.54	0.15	0.76	0.76																												
	Åbøelva, Saudafj, Boknafj.	82	82	82	85.0	136.0	85.0	136.0	2.50	1.1	0.4	98	77	0.35	1.06	0.04	0.18	0.18																												
	Vikedalse.. Boknafj.	118	117	117	80.0	108.0	80.0	108.0	2.97	3.2	0.4	128	98	0.28	1.75	0.04	0.20	0.44																												

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1990 (Detection limit = limit).

County	Watercourse	Runoff data										Parameters (mean values)									
		Drainage area		Discharge		Sampling station		gauging station		Cond mS/m	Tot-P tons	PO4-P tons	Tot-N tons	NO3-N tons	Cu tons	Zn tons	Cd tons	Pb tons	S.P.M. t.tons		
		Outlet kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1990 l/s kv.km	Normal l/s kv.km	1990 l/s kv.km													
Sogn og Fjordane (7.)	Nærøye.. Aurl.fj. Sognefj.	290	290	267	59.5	113.6	59.5	113.6	1.00	3.1	0.5	90	59	1.66	2.49	0.10	1.04	0.83			
	Flåmse.. Aurl.fj. Sognefj.	280	275	275	52.4	92.2	52.4	92.2	1.00	2.4	0.4	80	40	1.20	2.00	0.08	0.40	0.40			
	Aurlandv.. Aurl.fj. Sognefj.	800	799	762	48.6	85.5	48.6	85.5	1.71	8.6	1.1	368	293	1.72	4.74	0.22	1.08	0.22			
	Erdalse. Lærd.fj. Sognefj.	138	138	138	30.0	53.4	30.0	53.4	1.11	0.9	0.1	26	18	0.26	0.65	0.02	0.12	0.12			
	Lærdalsv.. Lærd.fj. Sognefj.	1184	1172	1172	30.0	53.4	30.0	53.4	1.28	11.8	2.0	195	122	5.33	4.93	0.20	0.99	2.96			
	Årdalsv. Årdalsfj. Sognefj.	989	989	989	44.9	64.8	44.9	64.8	1.28	6.7	2.0	414	188	6.06	10.11	0.40	2.02	4.04			
	Fortunv. Lusterfj. Sognefj.	508	508	367	51.0	76.5	51.0	76.5	1.77	4.9	0.6	151	92	2.70	5.51	0.61	0.61	0.98			
	Mørkrisv. Lusterfj. Sognefj.	282	282	203	52.0	85.8	54.7	85.8	1.77	3.1	0.4	94	57	1.68	3.43	0.38	0.38	0.61			
	Jostedøla. " Sognefj.	865	864	573	63.0	113.4	68.0	122.4	1.77	12.4	1.5	380	232	6.80	13.90	1.54	1.54	2.47			
	Årøye.. Sognd.fj. Sognefj.	449	446	384	66.5	125.0	77.2	143.1	1.77	7.0	0.9	216	132	3.87	7.91	0.88	0.88	1.41			
	Sogndalse. " Sognefj.	175	172	111	48.0	77.3	66.1	106.4	1.36	2.5	0.4	47	24	1.09	1.01	0.21	0.21	0.42			
	Gaular. Dalsfj. Bufj.	627	625	505	75.0	131.3	79.3	138.8	1.76	15.5	2.6	349	186	3.11	9.32	1.29	1.29	2.07			
	Jølstra. Førdefj.	714	709	384	70.6	113.0	74.3	118.9	2.19	22.7	2.5	417	192	2.27	12.13	1.26	1.26	2.02			
	Nausta. Førdefj.	277	273	232	81.7	134.8	81.7	134.8	1.25	5.8	1.2	108	58	0.81	2.79	0.58	0.58	1.04			
	Oselva. Høydalsfj.	287	285	225	78.7	132.2	78.7	132.2	1.82	5.3	1.2	190	24	0.59	2.38	0.59	0.59	1.19			
	Hopse.. Høyfj. Nordfj.S	73	73	161	75.0	131.2	75.0	131.2	1.33	1.2	0.2	26	13	0.21	0.48	0.15	0.15	0.12			
	Gjengedalse.. Nordfj.S	170	168	161	75.0	131.2	75.0	131.2	1.33	2.8	0.3	60	31	0.49	1.11	0.35	0.35	0.28			
	Breimse.. Gloppenfj. "	636	634	585	68.0	107.4	68.8	108.7	2.02	15.0	2.1	417	260	1.50	3.01	1.07	1.07	2.79			
	Oldene.. Indre Nordfj.	226	225	214	70.1	119.2	70.1	119.2	1.48	4.2	0.8	189	139	1.01	1.01	0.42	0.42	1.01			
	Loenelva. Indre Nordfj.	261	260	234	65.0	110.5	65.0	110.5	1.53	3.6	0.9	199	145	0.91	1.81	0.45	0.45	0.91			
Strynee.. Indre Nordfj.	532	530	493	60.2	105.4	60.2	105.4	2.03	8.8	1.8	291	180	2.47	3.52	0.88	0.88	2.47				
Hornindalse.. Nordfj. N	428	424	378	58.1	97.6	58.1	97.6	2.23	3.9	0.7	192	104	1.31	5.35	0.65	0.65	0.78				

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1990 (Detection limit = limit).

County	Watercourse	Runoff data										Parameters (mean values)								
		Drainage area		Discharge				Conductivity				Cu tons	Zn tons	Cd tons	Pb tons	S.P.M. t.tons				
		Outlet kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal 1/s kv.km	1990 Normal 1/s kv.km	1990 gauging station 1/s kv.km	Cond mS/m	Tot-P tons	PO4-P tons	Tot-N tons						NO3-N tons			
Møre og Romsdal (8.)	Ørstaæ., Ørstafj.	160	155		70.0	108.5	70.0	108.5	1.87	2.1	0.3	40	15	0.90	1.27	0.27	0.27	0.27	0.27	0.27
	Valldøla, Nordalfj., Storfj.	359	357		60.0	66.0	60.0	66.0	1.12	3.0	0.4	42	25	1.11	1.41	0.37	0.37	0.37	0.37	0.74
	Rauma, Romsdalsfj., Moldefj.	1202	1190	1142	32.8	35.0	32.8	35.0	1.46	6.6	1.3	255	177	1.05	4.60	0.66	0.66	0.66	0.66	1.71
	Isa, Isfj., Moldefj.	175	175	89	50.0	53.5	57.0	61.0	1.50	1.2	0.3	53	35	0.30	0.89	0.15	0.15	0.15	0.15	0.30
	Eira, Eresfj., Moldefj.	1119	1119	1085	34.8	40.0	34.8	40.0	1.50	5.6	1.4	254	169	1.41	2.82	0.71	0.71	0.71	0.71	1.41
	Littlelalse., Sunndalsfj.	359	330	330	41.0	42.2	41.0	42.2	1.50	1.1	0.4	76	59	0.66	0.88	0.22	0.22	0.22	0.22	0.44
	Driva, Sunnd., f., Tingvollfj.	2487	2435	2435	27.9	30.0	27.9	30.0	1.50	18.9	5.3	438	244	3.46	4.61	1.15	1.15	1.15	1.15	2.30
	Ulvåa, Åivundfj.	199	199	207	57.0	62.7	60.7	66.7	1.50	2.0	0.4	71	47	0.39	0.79	0.20	0.20	0.20	0.20	0.39
	Toåa, Todalsfj.	251	251	207	58.5	58.5	58.5	58.5	1.50	2.3	0.5	83	56	0.46	0.93	0.23	0.23	0.23	0.23	0.46
	Surna, Surnadalsfj.	1200	1200	1125	48.0	57.6	49.3	59.2	2.62	17.7	4.4	504	170	2.18	4.36	1.09	1.09	1.09	1.09	2.18
Sør-Trøndelag (8.)	Bøvra, Hammesfj., Halsafj.	243	243	196	55.0	66.0	55.0	66.0	2.00	2.5	0.5	101	51	0.51	1.01	0.25	0.25	0.25	0.25	0.51
	Børse., Gaulosen Tr.h.fj.	110	100		30.0	36.0	30.0	36.0	8.33	3.4	0.2	94	45	0.11	0.57	0.01	0.01	0.01	0.01	0.23
	Vigda, Gaulosen Tr.h.fj.	150	150		30.0	36.0	30.0	36.0	8.00	5.1	0.9	145	68	0.17	0.85	0.02	0.02	0.02	0.02	0.34
	Gaula, Gaulosen Tr.h.fj.	3659	3650	3062	26.4	27.2	26.4	27.2	5.15	46.3	15.7	889	416	20.35	62.62	0.31	0.31	0.31	0.31	6.26
	Nidelva, Trondheimsfj.	3110	3100	3049	35.5	38.3	35.5	38.3	5.00	56.2	18.7	1123	562	3.74	18.72	0.37	0.37	0.37	0.37	7.49
	Homla, Stjørd., f., Tr.h.fj.	157	157		30.0	32.4	30.0	32.4	5.00	1.6	0.5	48	24	0.16	0.80	0.02	0.02	0.02	0.02	0.32
	Stjørdalsv., Tr.h.fj.	2117	2117	1863	38.5	40.8	38.5	40.8	4.00	21.8	5.4	817	409	2.72	13.62	0.27	0.27	0.27	0.27	5.45
	Gråe., Tr.h.fj.	93	93		25.0	27.0	25.0	27.0	5.00	0.8	0.2	24	12	0.08	0.40	0.01	0.01	0.01	0.01	0.16
	Verdalsvassdr., Tr.h.fj.	1472	1472	898	40.0	44.4	44.5	49.4	5.00	16.5	4.1	618	309	2.06	10.31	0.21	0.21	0.21	0.21	4.12
	Nord-Trøndelag (8.)	Figga/Leksdalse., Tr.h.fj.	282	282	178	30.0	30.9	33.6	34.6	4.60	2.3	0.3	110	41	0.27	1.37	0.03	0.03	0.03	0.03
Snåsavassdr., Trondh.fj.		2153	2125	2125	35.1	42.1	35.1	42.1	3.80	13.8	3.4	691	271	1.69	14.11	0.28	0.28	0.28	0.28	14.11
Årgårdselva, Namsfj.		543	510	238	43.0	53.3	50.9	62.6	8.40	24.0	8.6	290	171	0.86	4.29	0.09	0.09	0.09	0.09	4.29
Namsen, Namsfj., Ø		6277	6276	5718	44.0	54.1	43.4	53.4	2.82	68.5	10.7	2195	589	51.40	108.15	1.07	1.07	1.07	1.07	21.41
Salsvatnelva, Follafj.		432	432	422	59.7	69.3	59.7	69.3	5.00	4.7	0.9	189	57	0.94	4.72	0.09	0.09	0.09	0.09	4.72

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1990 (Detection limit = limit).

County	Watercourse	Runoff data										Parameters (mean values)						
		Drainage area		Discharge		Sampling station		gauging station		Cond mS/m	Tot-P tons	Tot-N tons	NO3-N tons	Cu tons	Zn tons	Cd tons	Pb tons	S.P.M. t.tons
		Outlet kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal 1990 l/s kv.km	1990 l/s kv.km	Normal 1990 l/s kv.km	1990 l/s kv.km										
Nordland (9.)	Åbjøra. Bindalsfj. S	526	520	384	80.0	107.2	80.2	107.5	5.95	5.6	1.8	308	88	1.76	8.79	0.18	0.88	1.76
	Skjerva. Vefsenfj. S	104	104	98	41.3	50.8	41.3	50.8	5.03	2.1	0.5	57	17	0.17	0.83	0.02	0.08	0.33
	Fusta. Vefsenfj. N	544	543	520	63.4	79.9	63.4	79.9	3.79	7.4	1.4	309	137	1.37	6.84	0.14	0.68	2.05
	Drevja. Vefsenfj. N	177	176	98	65.0	81.9	65.0	81.9	6.30	8.1	2.3	86	36	0.45	2.27	0.05	0.23	0.91
	Røssåga. Sørfj.	2092	2087	1880	45.4	58.6	45.4	58.6	4.77	36.3	7.7	567	193	9.64	19.28	0.39	1.93	5.79
	Bjerka. Sørfj.	385	385	273	55.0	71.5	55.4	72.0	4.00	4.3	0.9	130	52	1.74	4.34	0.09	0.43	1.30
	Dalselva. Ranafj. N	211	211	129	38.0	41.8	39.5	43.4	4.00	1.4	0.3	42	17	0.56	1.39	0.03	0.14	0.42
	Ranavassdraget. Ranafj. N	3847	3846	1892	51.3	66.7	44.9	63.3	3.53	39.6	8.1	1594	485	20.22	40.45	0.81	4.04	12.13
	Fykanåga. Glomfjord	297	297	243	100.0	116.0	103.7	120.3	3.32	2.2	1.1	97	74	2.17	5.43	0.11	0.54	1.63
	Beiare..Beiarfj. Nordfj.	1064	875	797	45.1	49.6	45.1	49.6	4.77	12.6	7.1	166	92	2.74	6.84	0.14	0.68	2.74
	Saltdalsvassdr..Saltd.fj.S	1544	1543	1168	30.6	33.7	32.1	35.1	3.60	42.0	9.8	274	98	3.28	8.20	0.16	0.82	3.28
	Sulitjelmavassdr..Saltd.fj	1028	800	791	43.8	46.0	44.3	46.5	3.87	5.0	1.2	161	70	25.53	33.31	0.12	0.93	2.32
	Kobbe. Leirfj. Sørfolda N	405	405	383	66.9	70.2	66.9	70.2	1.56	8.1	1.8	108	27	1.79	4.48	0.09	0.45	0.45
	Skjoma. Ofotfj. S	845	840	797	36.3	42.1	36.3	42.1	1.34	3.3	1.1	67	20	1.12	5.58	0.11	0.56	0.56

Table 9.2

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Table 9.2 TRIBUTARY RIVERS. ANNUAL LOAD 1990 (Detection limit = limit).

County	Watercourse	Runoff data										Parameters (load)									
		Drainage area		Discharge		Disch. gaug. station	Sampling station		gauging station		Hg	Gamma HCH	IUPAC NOS					SUM			
		Outlet	Sampl. station	Normal	1990		Normal	1990	Normal	1990			28	52	101	118	138	153	180	PCB	kg
		kv.km	kv.km	kv.km	kv.km	l/s kv.km	l/s kv.km	l/s kv.km	l/s kv.km	l/s kv.km	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	
Østfold (1.)	Tista. Iddefj.	1588	1582	1582	14.4	14.3	14.4	14.3	14.3	1.43	2.283	0.357	0.357	0.357	0.357	0.357	0.357	0.357	0.357	2.497	
	Mosselva. Mossesundet	687	686	686	14.5	14.7	14.5	14.7	14.7	0.64	0.604	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	1.113	
	Oslo & Akershus (1.)	Hølenelva. Drøbakundet Ø	137	121		14.0	14.8				0.11	0.113	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.198
		Årungenelva. I. Oslofj.	52	50		13.0	13.0				0.04	0.043	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.072
		Gjersjøelva. I. Oslofj.	86	85	85	14.0	5.0		5.0		0.03	0.027	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.047
		Ljanselva. I. Oslofj.	42	41	41	13.0	11.8		11.8		0.00	0.038	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.053
		Loelva/Alna. I. Oslofj.	75	69	69	13.0	13.5		13.5		0.01	0.073	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.103
		Akerselva. I. Oslofj.	227	225	225	17.5	8.3		8.3		0.12	0.118	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.206
		Frognerelva. I. Oslofj.	23	20	20	15.0	23.1		23.1		0.03	0.036	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.051
		Lysakerelva. I. Oslofj.	178	173	173	16.8	20.9		20.9	16.8	0.23	0.285	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.399
Sandvikselva. I. Oslofj.		223	187	187	18.4	20.5		20.5	18.4	0.02	0.302	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.423	
	Åroselva. I. Oslofj.	113	109	109	17.0	17.0		17.0	17.0	0.01	0.146	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.205	
Buskerud (2.)	Lierelva. Drammensfj. Ø	309	266	222	18.6	14.4		14.4	18.6	0.24	0.302	0.060	0.121	0.072	0.060	0.060	0.060	0.060	0.060	0.495	
Vestfold (3.)	Sandeelva. Sandebukta	193	190		17.0	17.0		17.0	17.0	0.20	0.255	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.357	
	Aulielva. Tønsbergfj.	363	362	362	14.9	17.0		17.0	14.9	0.39	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.679	
	Farriselva. Larvikfj.	491	491	491	21.6	21.7		21.7	21.6	0.67	0.840	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	1.176	
Telemark (4.)	Tokkeelva. Kragerø	1238	1200	1200	26.7	25.0		25.0	26.7	1.89	2.838	0.473	0.473	0.473	0.473	0.473	0.473	0.473	0.473	3.311	
Aust-Agder (5.)	Gjerstadelva. Søndeledfj.	419	414	291	27.0	31.0		31.0	29.3	0.81	0.850	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	1.417	
	Vegårdselva. Sandnesfj.	457	429	291	29.3	33.7		33.7	29.3	0.91	1.140	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	1.596	
	Nidelva. Arendal	4025	4020	3956	29.3	35.6		35.6	29.8	9.03	13.540	2.257	2.257	2.257	2.257	2.257	2.257	2.257	2.257	15.796	

APPENDIX X : "MEAN" TOTAL DISCHARGES (Mean concentrations of main and tributary rivers multiplied with mean runoff 1930-60

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* Measurements below detection limits are treated in two ways: "Detection limit = Zero", and "Detection limit = limit". This concerns the substances Cd, Pb, Hg and PCBs. In Table 10.5A the "limit-values" are shown, in Table 10.5B the "zero-values" are presented.

**Table X "MEAN" TOTAL DISCHARGES from MAINLAND NORWAY
to convention waters (Mean runoff 1930 - 60 (Fig. I)).**

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.8	1.7 *	3.7 *	6.2	tonnes
Cadmium			23.1 **	7.0 **	30.9	tonnes
Mercury		579	7 *	37 *	623	kg
Mercury			280 **	124 **	983	kg
Copper		89	278	178	546	tonnes
Zinc		82	873	435	1390	tonnes
Lead		11.9	31.0 *	15.1 *	58.0	tonnes
Lead			84.9 **	32.4 **	129.2	tonnes
PCBs ***			0.2 *	66.3 *	66.6	kg
PCBs			483.4 **	229.6 **	713.0	kg
gamma-HCH			266	134	400	kg
NO3-N			15520	13559	29079	tonnes
PO4-P			251	247	498	tonnes
Total N	23442	14195	31729	22184	91551	tonnes
Total P	715	1209	1089	664	3677	tonnes
S.P.M.		5067443	190105	324516	5582065	tonnes
TOC		555			555	tonnes
COD		280407			280407	tonnes
BOD		38128			38128	tonnes

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.1 "MEAN" TOTAL DISCHARGES to The Skagerrak Region
(Mean runoff 1930 - 60 (Fig. I.I)).**

The Skagerrak Region with main rivers (1) Glomma, (2) Drammenselva, (3) Numedalslågen, (4) Skienselva, (5) Otra

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.2	0.1 *	3.5 *	3.8	tonnes
Cadmium			1.4 **	5.7 **	7.3	tonnes
Mercury		216	0 *	37 *	254	kg
Mercury			26 **	98 **	340	kg
Copper		62	31	124	217	tonnes
Zinc		30	134	333	497	tonnes
Lead		2.7	3.3 *	12.0 *	18.1	tonnes
Lead			8.4 **	25.4 **	36.4	tonnes
PCBs ***			0.2 *	61.2 *	61.4	kg
PCBs			46.1 **	183.9 **	230.0	kg
gamma-HCH			40	117	156	kg
NO3-N			3383	11764	15147	tonnes
PO4-P			30	222	252	tonnes
Total N	2779	6764	6037	19036	34616	tonnes
Total P	75	349	162	582	1168	tonnes
S.P.M.		22048	20552	303651	346251	tonnes
TOC		445			445	tonnes
COD		190545			190545	tonnes
BOD		13869			13869	tonnes

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.2 "MEAN" TOTAL DISCHARGES to The Remaining North Sea
(Mean runoff 1930 - 60 (Fig. I.II)).**

The North Sea Region with main rivers : (6) Orreelva, (7) Suldalslågen

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.5	0.3 *	0.0 *	0.8	tonnes
Cadmium			8.6 **	0.3 **	9.4	tonnes
Mercury		233	7 *	0 *	240	kg
Mercury			89 **	7 **	329	kg
Copper		17	62	5	84	tonnes
Zinc		32	257	11	299	tonnes
Lead		7.3	14.4 *	0.1 *	21.9	tonnes
Lead			28.0 **	1.7 **	37.1	tonnes
PCBs ***			0.0 *	0.2 *	0.2	kg
PCBs			147.5 **	12.1 **	159.5	kg
gamma-HCH			141	11	151	kg
NO3-N			6283	865	7148	tonnes
PO4-P			59	6	64	tonnes
Total N	9109	3979	9851	1140	24080	tonnes
Total P	188	421	277	24	909	tonnes
S.P.M.		2030253	45598	3577	2079428	tonnes
TOC		20			20	tonnes
COD		38356			38356	tonnes
BOD		11448			11448	tonnes

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.3 "MEAN" TOTAL DISCHARGES to The Norwegian Sea
(Mean runoff 1930 - 60 (Fig. I.III)).**

The Norwegian Sea Region with main rivers (8) Orkla, (9) Vefsna

Substance	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.1	1.3 *	0.2 *	1.6	tonnes
Cadmium			11.4 **	0.7 **	12.2	tonnes
Mercury		120	0 *	0 *	120	kg
Mercury			131 **	14 **	264	kg
Copper		10	159	45	213	tonnes
Zinc		19	387	86	492	tonnes
Lead		1.7	0.9 *	3.0 *	5.6	tonnes
Lead			33.0 **	4.0 **	38.7	tonnes
PCBs ***			0.0 *	4.9 *	4.9	kg
PCBs			228.4 **	24.4 **	252.9	kg
gamma-HCH			58	5	63	kg
NO3-N			5412	788	6200	tonnes
PO4-P			144	10	155	tonnes
Total N	9957	3231	13283	1526	27997	tonnes
Total P	370	410	551	34	1365	tonnes
S.P.M.		1514435	106968	14664	1636066	tonnes
TOC		90			90	tonnes
COD		49739			49739	tonnes
BOD		12002			12002	tonnes

Measurements below detection limits are treated in two ways :

- *) Detection limit = Zero
- **) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.4 "MEAN" TOTAL DISCHARGES to The Barents Sea
(Mean runoff 1930 - 60 (Fig. I.IV)).**

The Barents Sea Region with main river (10) Alta

Substance	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.0	0.0 *	0.0 *	0.0	tonnes
Cadmium			1.8 **	0.3 **	2.0	tonnes
Mercury		10	0 *	0 *	10	kg
Mercury			35 **	5 **	51	kg
Copper		1	26	4	31	tonnes
Zinc		1	95	6	103	tonnes
Lead		0.1	12.3 *	0.0 *	12.4	tonnes
Lead			15.6 **	1.3 **	17.0	tonnes
PCBs ***			0.0 *	0.0 *	0.0	kg
PCBs			61.4 **	9.2 **	70.6	kg
gamma-HCH			27	2	29	kg
NO3-N			442	142	584	tonnes
PO4-P			18	9	27	tonnes
Total N	1597	221	2558	483	4859	tonnes
Total P	83	29	100	24	235	tonnes
S.P.M.		1500707	16987	2625	1520320	tonnes
TOC		0				tonnes
COD		1768			1768	tonnes
BOD		809			809	tonnes

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

*** the following congeners: IUPAC Nos. 28,52,101,118,153,138,180

**Table 10.6 The Skagerrak Region. "Mean" inputs from tributary rivers in The Sub-areas (1-5).
(Mean concentrations 1990 multiplied with mean runoff, 1930-60)**

The Skagerrak Region with sub-areas: (1A) Glomma, (1B) Inner Oslofj., (2) Drammenselva,
(3) Numedalslågen, (4) Skienselva, (5) Otra

Total quantity of substance discharged per year:							Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load	
Sub-areas :	1A	1B	2	3	4	5			
Substance:									
Cd *	0.00	0.09	0.00	0.00	0.00	0.00	tonnes	NO	_____ %
Cd **	0.11	0.10	0.02	0.06	0.10	0.98	tonnes		_____ %
Hg *	0.00	0.00	0.00	0.00	0.00	0.00	kg	NO	_____ %
Hg **	2.17	0.61	0.31	1.21	2.02	19.59	kg		_____ %
Cu	1.6	5.3	0.2	1.2	10.8	11.8	tonnes	YES	_____ %
Zn	4.6	12.6	1.6	5.1	20.2	89.9	tonnes	YES	_____ %
Pb *	0.00	1.67	0.00	0.09	0.00	1.57	tonnes	NO	_____ %
Pb **	0.54	1.73	0.08	0.34	0.51	5.16	tonnes		_____ %
PCBs *	0.00	0.00	0.25	0.00	0.00	0.00	kg	NO	_____ %
PCBs **	3.80	1.73	0.64	2.12	3.54	34.27	kg		_____ %
gamma-HCH	3.00	1.15	0.39	1.18	3.03	30.99	kg	YES	_____ %
NO3-N	572	322	126	536	217	1610	tonnes	YES	_____ %
PO4-P	4.3	7.7	0.9	3.9	1.0	12.2	tonnes	YES	_____ %
Total N	1199	601	154	704	388	2990	tonnes	YES	_____ %
Total P	33	34	6	21	4	64	tonnes	YES	_____ %
S.P.M.	2847	3233	437	2204	1799	10033	tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 10.7 The remaining North Sea. "Mean" inputs from tributary rivers in The Sub-areas (6-7). (Mean concentrations 1990 multiplied with mean runoff, 1930-60)

The remaining North Sea Region with sub-areas: (6) Orreelva, (7) Suldalslågen

Total quantity of substance discharged per year:			Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Sub-areas :	6	7		
Substance:				
Cd *	0.00	0.28	tonnes NO	%
Cd **	1.49	7.10	tonnes	%
Hg *	0.00	6.97	kg NO	%
Hg **	29.87	59.04	kg	%
Cu	25.3	37.2	tonnes YES	%
Zn	129.8	127.1	tonnes YES	%
Pb *	11.32	3.12	tonnes NO	%
Pb **	13.41	14.63	tonnes	%
PCBs *	0.00	0.00	kg NO	%
PCBs **	52.27	95.18	kg	%
gamma-HCH	51.38	89.31	kg YES	%
NO3-N	3597	2686	tonnes YES	%
PO4-P	32.3	26.3	tonnes YES	%
Total N	5416	4435	tonnes YES	%
Total P	148	129	tonnes YES	%
S.P.M.	24118	21480	tonnes YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

**Table 10.8 The Norwegian Sea. "Mean" inputs from tributary rivers in The Sub-areas (8-9).
(Mean concentrations 1990 multiplied with mean runoff, 1930-60)**

The Norwegian Sea Region with sub-areas: (8) Orkla, (9) Vefsna

Total quantity of substance discharged per year:			Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Sub-areas :	8	9		
Substance:				
Cd *	0.30	1.03	tonnes NO	_____ %
Cd **	8.52	2.88	tonnes	_____ %
Hg *	0.00	0.00	kg NO	_____ %
Hg **	72.84	57.69	kg	_____ %
Cu	87.4	71.3	tonnes YES	_____ %
Zn	238.9	148.4	tonnes YES	_____ %
Pb *	0.00	0.88	tonnes NO	_____ %
Pb **	18.21	14.75	tonnes	_____ %
PCBs *	0.00	0.00	kg NO	_____ %
PCBs **	127.47	100.96	kg	_____ %
gamma-HCH	35.69	22.24	kg YES	_____ %
NO3-N	3927	1485	tonnes YES	_____ %
PO4-P	78.4	66.0	tonnes YES	_____ %
Total N	8578	4705	tonnes YES	_____ %
Total P	303	249	tonnes YES	_____ %
S.P.M.	68949	38019	tonnes YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 10.9 The Barents Sea. "Mean" inputs from tributary rivers in The Sub-area (10).
(Mean concentrations 1990 multiplied with mean runoff, 1930-60)

The Barents Sea Region with sub-area: (10) Alta

Total quantity of substance discharged per year:		Were 70 % of measurements above the detection limit ?	Precision of the estimate of the load
Sub-area :	10		
Substance:			
Cd *	0.00	tonnes NO	_____ %
Cd **	1.76	tonnes	_____ %
Hg *	0.00	kg NO	_____ %
Hg **	35.10	kg	_____ %
Cu	26.3	tonnes YES	_____ %
Zn	95.3	tonnes YES	_____ %
Pb *	12.33	tonnes NO	_____ %
Pb **	15.55	tonnes	_____ %
PCBs *	0.00	kg NO	_____ %
PCBs **	61.43	kg	_____ %
gamma-HCH	27.35	kg YES	_____ %
NO3-N	442	tonnes YES	_____ %
PO4-P	18.2	tonnes YES	_____ %
Total N	2558	tonnes YES	_____ %
Total P	100	tonnes YES	_____ %
S.P.M.	16987	tonnes YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit