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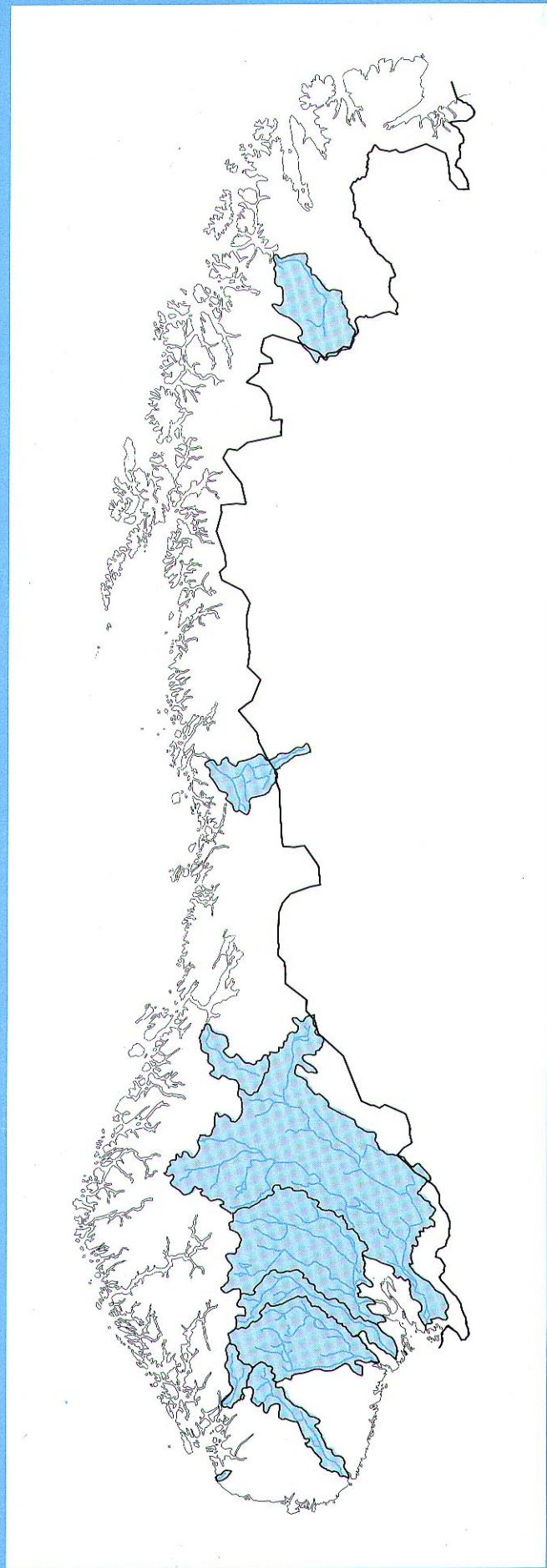
NIVA

Report 488B/92

Paris Convention

Annual report on direct and riverine inputs
to Norwegian coastal waters during the year
1991

B Data report



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Abstract: This report contains data from the 1991 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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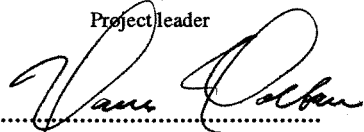
4 keywords, Norwegian

1. Forurensningstilførsler
2. Norske kystområder
3. Elvetilførsler
4. Direkte tilførsler

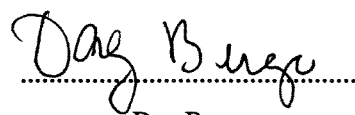
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1. Pollution inputs
2. Norwegian coastal waters
3. Riverine inputs
4. Direct discharges

Project leader


.....
Hans Holtan

For the Administration


.....
Dag Berge

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The National Environmental
Monitoring Programme

Paris Convention

Annual report on direct and riverine inputs
to Norwegian coastal waters during the year
1991

B Data report

Oslo, June 1992

Project manager: Hans Holtan

Project coordinator: Gjertrud Holtan

Co-workers: Dag Berge

Terje Hopen



PREFACE

This report presents data from the 1991 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 1991-investigation lasted from January till December. This report is the Norwegian part of the 1991-study, divided into two parts:

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

The Programme Committee has consisted of Jon-Lasse Bratli and Dag Rosland (SFT), Dag Berge and Hans Holtan (NIVA). The practical investigation is coordinated, and performed by Gjertrud Holtan (NIVA). The calculations of all data has been performed by Terje Hopen (NIVA). References and names of all participants 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 continous 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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(3) Numedalslågen "tributaries" : Sandeelva - Farriselva	
(4) Skienselva "tributary" : Tokkeelva	
(5) Otra "tributaries" : Gjerstade. - Audna	
(6) Orreelva "tributaries" : Lygna - Ulla	
(7) Suldalslågen "tributaries": Saudaelva - Hornindalselva	
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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.

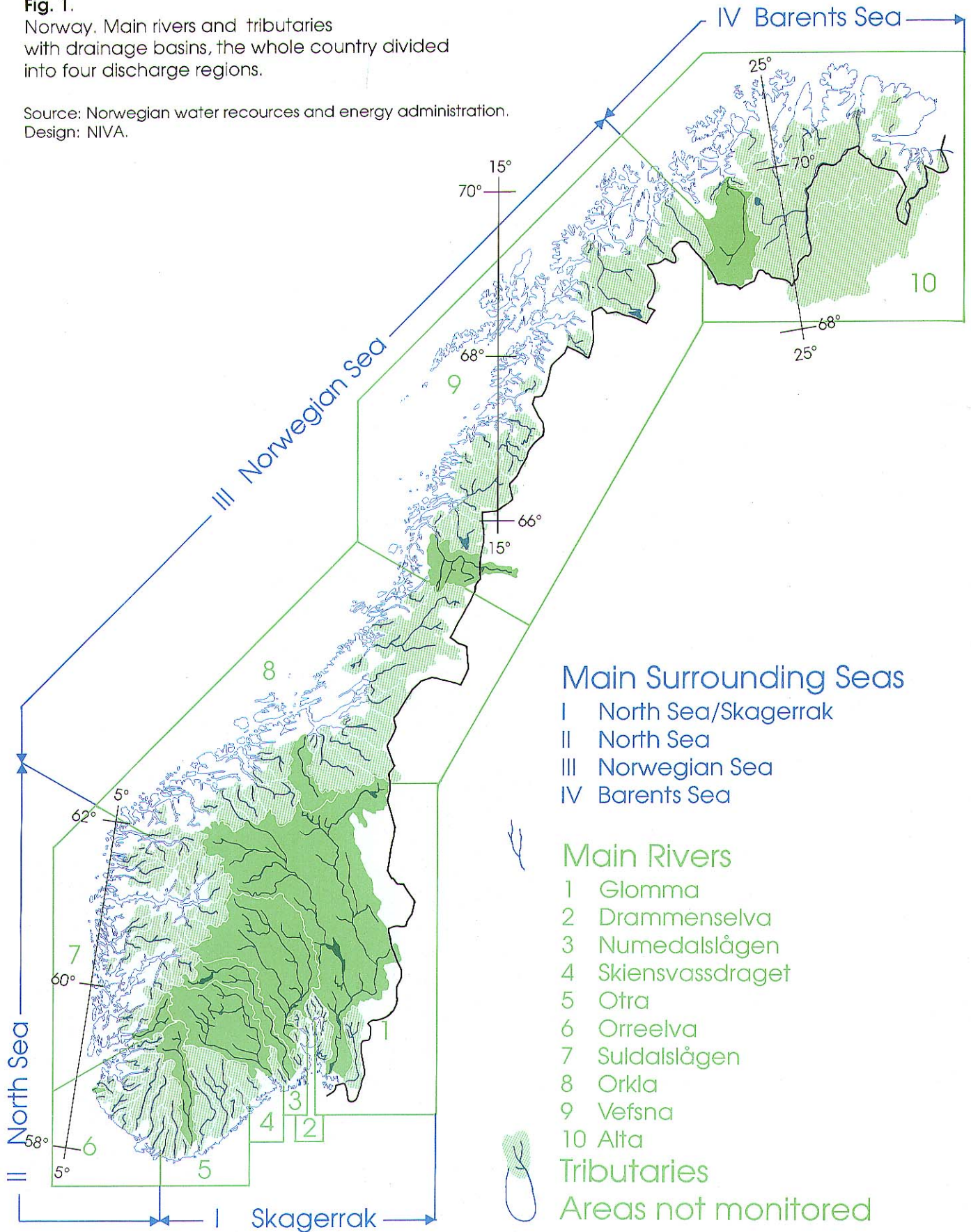
(1) THE COUNTRY IS NORWAY

(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: 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 1991 (Fig. I).**

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.4	6.3 *	1.4 *	8.1	tonnes
Cadmium			6.5 **	1.6 **	8.5	tonnes
Mercury		314	36 *	65 *	415	kg
Mercury			307 **	127 **	748	kg
Copper		51	210	95	356	tonnes
Zinc		78	629	332	1039	tonnes
Lead		13.2	72.3 *	15.7 *	101.3	tonnes
Lead			73.1 **	16.7 **	103.0	tonnes
Arsenic		0.5		9.3	9.8	tonnes
Cr-T		112.7		0.8 *	113.5	tonnes
Cr-T				18.6 **	131.3	tonnes
PCBs ***			0.3 *	1.6 *	1.9	kg
PCBs			56.3 **	18.1 **	74.4	kg
gamma-HCH			229	32	261	kg
NO3-N	15150	11.2	16457	12258	28726	tonnes
PO4-P	208	694.8	208	234	1136	tonnes
Total N	24259	14447	29811	20146	88664	tonnes
Total P	791	1387	825	590	3594	tonnes
S.P.M.		4556472	249835	183280	4989587	tonnes
TOC		21339		149191	170531	tonnes
DOC				77497	77497	tonnes
COD		265939			265939	tonnes
BOD		39440			39440	tonnes
AOX		1077		454	1531	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 1991 (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		0.16	1.3 *	0.8 *	2.3	tonnes
Cadmium			1.3 **	0.9 **	2.4	tonnes
Mercury		136.19	26 *	55 *	218	kg
Mercury			38 **	100 **	274	kg
Copper		26.62	16	58	100	tonnes
Zinc		27.39	145	245	417	tonnes
Lead		2.34	8.0 *	13.5 *	23.8	tonnes
Lead			8.0 **	13.9 **	24.2	tonnes
Arsenic		0.48		9.0	9.5	tonnes
Cr-T		8.69		0.8 *	9.5	tonnes
Cr-T				17.7 **	26.4	tonnes
PCBs ***			0.0 *	1.6 *	1.6	kg
PCBs			9.8 **	13.9 **	23.7	kg
gamma-HCH			48	28	75	kg
NO3-N	1872	5	3576	11112	14693	tonnes
PO4-P	21	192	30	211	434	tonnes
Total N	2910	7124	6091	17553	33678	tonnes
Total P	83	425	129	518	1155	tonnes
S.P.M.		18883	20840	159479	199202	tonnes
TOC		9530		121075	130605	tonnes
DOC				66254		
COD		176392			242646	tonnes
BOD		13940			13940	tonnes
AOX		1077		449	1526	tonnes

Measurements below detection limits are treated in two ways :

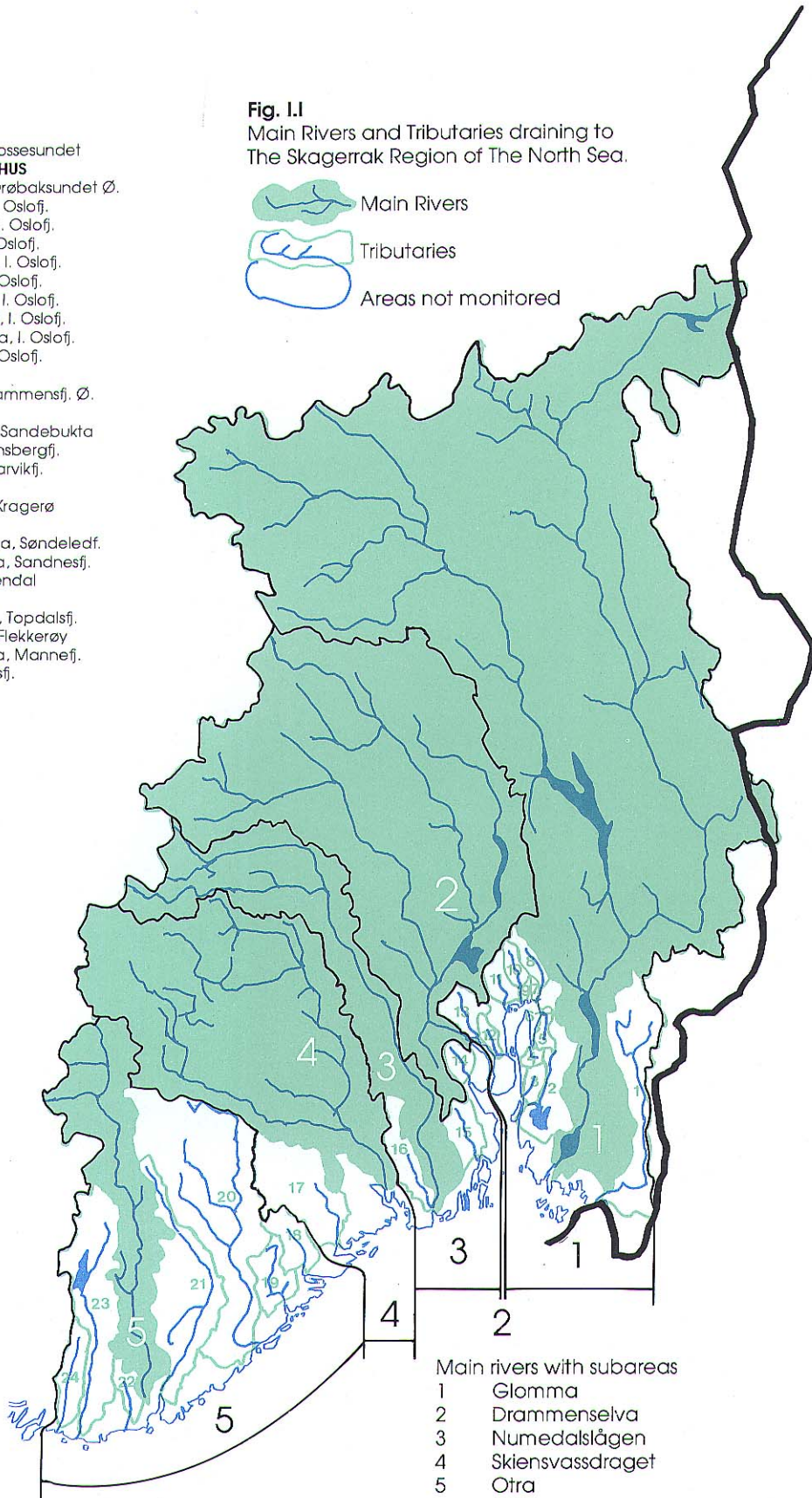
*) Detection limit = Zero

**) Detection limit = Limit

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

- 1 ØSTFOLD**
 1 Tista, Iddefj.
 2 Mosselva, Mossesundet
- OSLO & AKERSHUS**
 3 Hølenelva, Drøbaksundet Ø.
 4 Årungenelva, I. Oslofj.
 5 Gjersjøelva, I. Oslofj.
 6 Ljanselva, I. Oslofj.
 7 Loelva/Alna, I. Oslofj.
 8 Akerselva, I. Oslofj.
 9 Frognerelva, I. Oslofj.
 10 Lysakerelva, I. Oslofj.
 11 Sandvikselva, I. Oslofj.
 12 Åroselva, I. Oslofj.
- 2 BUSKERUD**
 13 Lierelva, Drammensfj. Ø.
- 3 VESTFOLD**
 14 Sandeelva, Sandebukta
 15 Aulielva, Tønsbergfj.
 16 Farriselva, Larvikfj.
- 4 TELEMARK**
 17 Tokkeelva, Kragerø
- 5 AUST-AGDER**
 18 Gjerstadelva, Søndeledf.
 19 Vegårdselva, Sandnesfj.
 20 Nidelva, Arendal
- VEST-AGDER**
 21 Tovdalselva, Topdalsfj.
 22 Søgneelva, Flekkerøy
 23 Mandalselva, Mannefj.
 24 Audna, Sniksfj.

Fig. I.1
 Main Rivers and Tributaries draining to
 The Skagerrak Region of The North Sea.



- Main rivers with subareas
 1 Glomma
 2 Drammenselva
 3 Numedalslågen
 4 Skiensvassdraget
 5 Otra

I North Sea/Skagerrak

**Table 1.2 TOTAL DISCHARGES to The Remaining North Sea
1991 (Fig. I.II).**

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

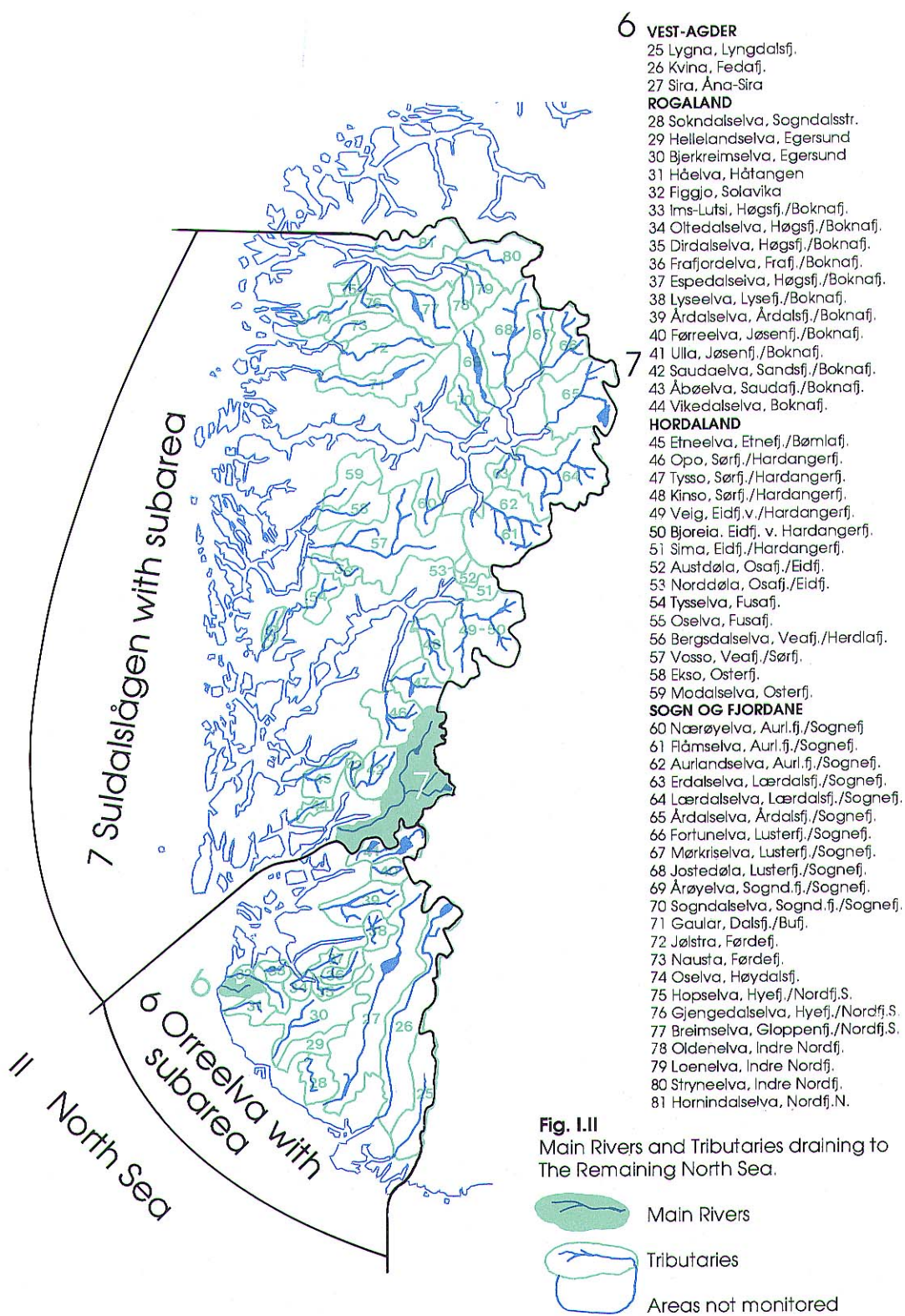
Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.19	1.0 *	0.0 *	1.2	tonnes
Cadmium			1.2 **	0.0 **	1.5	tonnes
Mercury		103.59	0 *	0 *	104	kg
Mercury			88 **	4 **	195	kg
Copper		14.43	52	1	68	tonnes
Zinc		31.42	194	5	231	tonnes
Lead		9.36	17.8 *	0.1 *	27.3	tonnes
Lead			18.6 **	0.3 **	28.3	tonnes
Arsenic		0.04		0.3	0.3	tonnes
Cr-T		8.10		0.0 *	8.1	tonnes
Cr-T				0.9 **	9.0	tonnes
PCBs ***			0.0 *	0.0 *	0.0	kg
PCBs			15.4 **	0.7 **	16.1	kg
gamma-HCH			139	2	141	kg
NO3-N	5773	3	7746	388	8137	tonnes
PO4-P	56	236	55	5	296	tonnes
Total N	9318	3005	11159	558	24040	tonnes
Total P	199	431	233	14	877	tonnes
S.P.M.		1822362	35755	2704	1860822	tonnes
TOC		5356		637	5994	tonnes
DOC				529		tonnes
COD		35728			36257	tonnes
BOD		11429			11429	tonnes
AOX		0		5	5	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



6 VEST-AGDER

- 25 Lygna, Lyngdalsfj.
- 26 Kvina, Fedafj.
- 27 Sira, Ana-Sira

ROGALAND

- 28 Sokndalselva, Sogndalsstr.
- 29 Hellelandselva, Egersund
- 30 Bjerkreimselva, Egersund
- 31 Håelva, Håtangen
- 32 Figgjo, Solavika
- 33 Ims-Lutsi, Høgsfj./Boknafj.
- 34 Oljedalselva, Høgsfj./Boknafj.
- 35 Dirdalselva, Høgsfj./Boknafj.
- 36 Frøfjordelva, Frøfj./Boknafj.
- 37 Espedalselva, Høgsfj./Boknafj.
- 38 Lyseelva, Lysefj./Boknafj.
- 39 Årdalselva, Årdalsfj./Boknafj.
- 40 Førreelva, Jøsenfj./Boknafj.
- 41 Ulla, Jøsenfj./Boknafj.
- 42 Saudaelva, Sandsfj./Boknafj.
- 43 Årbøelva, Saudafj./Boknafj.
- 44 Vikedalselva, Boknafj.

HORDALAND

- 45 Etneelva, Etnefj./Bømlafj.
- 46 Opo, Sørfj./Hardangerfj.
- 47 Tyssø, Sørfj./Hardangerfj.
- 48 Kinso, Sørfj./Hardangerfj.
- 49 Veig, Eidfj.v./Hardangerfj.
- 50 Bjørelva, Eidfj. v. Hardangerfj.
- 51 Sima, Eidfj./Hardangerfj.
- 52 Austdøla, Osafj./Eidfj.
- 53 Norddøla, Osafj./Eidfj.
- 54 Tysselva, Fusafj.
- 55 Oselva, Fusafj.
- 56 Bergsdalselva, Veafj./Herdlafj.
- 57 Vosso, Veafj./Sørfj.
- 58 Ekso, Osterfj.
- 59 Modalselva, Osterfj.

SOGN OG FJORDANE

- 60 Nærøyelva, Aurl.fj./Sognefj.
- 61 Flåmselva, Aurl.fj./Sognefj.
- 62 Aurlandselva, Aurl.fj./Sognefj.
- 63 Erdalselva, Lærdalsfj./Sognefj.
- 64 Lærdalselva, Lærdalsfj./Sognefj.
- 65 Årdalselva, Årdalsfj./Sognefj.
- 66 Fortunelva, Lusterfj./Sognefj.
- 67 Mørkriselva, Lusterfj./Sognefj.
- 68 Jostedaløla, Lusterfj./Sognefj.
- 69 Årøyelva, Sognd.fj./Sognefj.
- 70 Sogndalselva, Sognd.fj./Sognefj.
- 71 Gaular, Dalsfj./Bufj.
- 72 Jølstra, Førdefj.
- 73 Nausta, Førdefj.
- 74 Oselva, Høyalsfj.
- 75 Hopselva, Høyfj./Nordfj.S.
- 76 Gjengedalselva, Høyfj./Nordfj.S.
- 77 Breimselva, Gløppenfj./Nordfj.S.
- 78 Oldenelva, Indre Nordfj.
- 79 Loenelva, Indre Nordfj.
- 80 Stryneelva, Indre Nordfj.
- 81 Hornindalselva, Nordfj.N.

Fig. I.II
Main Rivers and Tributaries draining to The Remaining North Sea.

-  Main Rivers
-  Tributaries
-  Areas not monitored

Table 1.3 TOTAL DISCHARGES to The Norwegian Sea 1991 (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		0.09	3.5 *	0.5 *	4.1	tonnes
Cadmium			3.5 **	0.5 **	4.1	tonnes
Mercury		69.61	10 *	5 *	84	kg
Mercury			140 **	17 **	226	kg
Copper		9.78	105	32	147	tonnes
Zinc		17.92	188	76	282	tonnes
Lead		1.47	32.8 *	2.1 *	36.4	tonnes
Lead			32.8 **	2.3 **	36.5	tonnes
Arsenic		0.00			0.0	tonnes
Cr-T		95.57			95.6	tonnes
Cr-T					95.6	tonnes
PCBs ***			0.2 *	0.0 *	0.2	kg
PCBs			23.9 **	2.5 **	26.4	kg
gamma-HCH			35	2	36	kg
NO3-N	6491	3	4734	626	5364	tonnes
PO4-P	113	253	102	12	366	tonnes
Total N	10347	4123	9778	1420	25668	tonnes
Total P	421	507	347	33	1308	tonnes
S.P.M.		1114630	170240	16292	1301162	tonnes
TOC		6107		16437	22544	tonnes
DOC						tonnes
COD		52280			52280	tonnes
BOD		13359			13359	tonnes
AOX		0			0	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

- 8 MØRE OG ROMSDAL**
 82 Ørstaelva, Ørsta fj.
 83 Valldøla, Nordalfj./Storfj.
 84 Rauma, Romsdalsfj./Moldefj.
 85 Isa, Isfj./Moldefj.
 86 Eira, Eresfj./Moldefj.
 87 Littledalselva, Sunndalsfj.
 88 Driva, Sunnd.fj./Tingvollfj.
 89 Ulvåa, Ålvundfj.
 90 Toåa, Todalsfj.
 91 Surna, Surnadalsfj.
 92 Bøvra, Hamnesfj./Halsafj.
SØR-TRØNDELAG
 93 Børselva, Gaulosen/Tr.h.fj.
 94 Vigda, Gaulosen/Tr.h.fj.
 95 Gaula, Gaulosen/Tr.h.fj.
 96 Nidelva, Trondheimsfj.
 97 Homla, Stjørd.fj./Tr.h.fj.

- NORD-TRØNDELAG**
 98 Stjørdalselva, Stjørdalsfj./Tr.h.fj.
 99 Gråelva, Stjørdalsfj./Tr.h.fj.
 100 Verdalsvassdr., Tr.h.fj.
 101 Figga/Leksdalselva, Tr.h.fj.
 102 Snåsavassdr., Tr.h.fj.
 103 Årgårdselva, Namsfj.
 104 Namsen, Namsfj. Ø.
 105 Salsvatnelva, Folla fj.

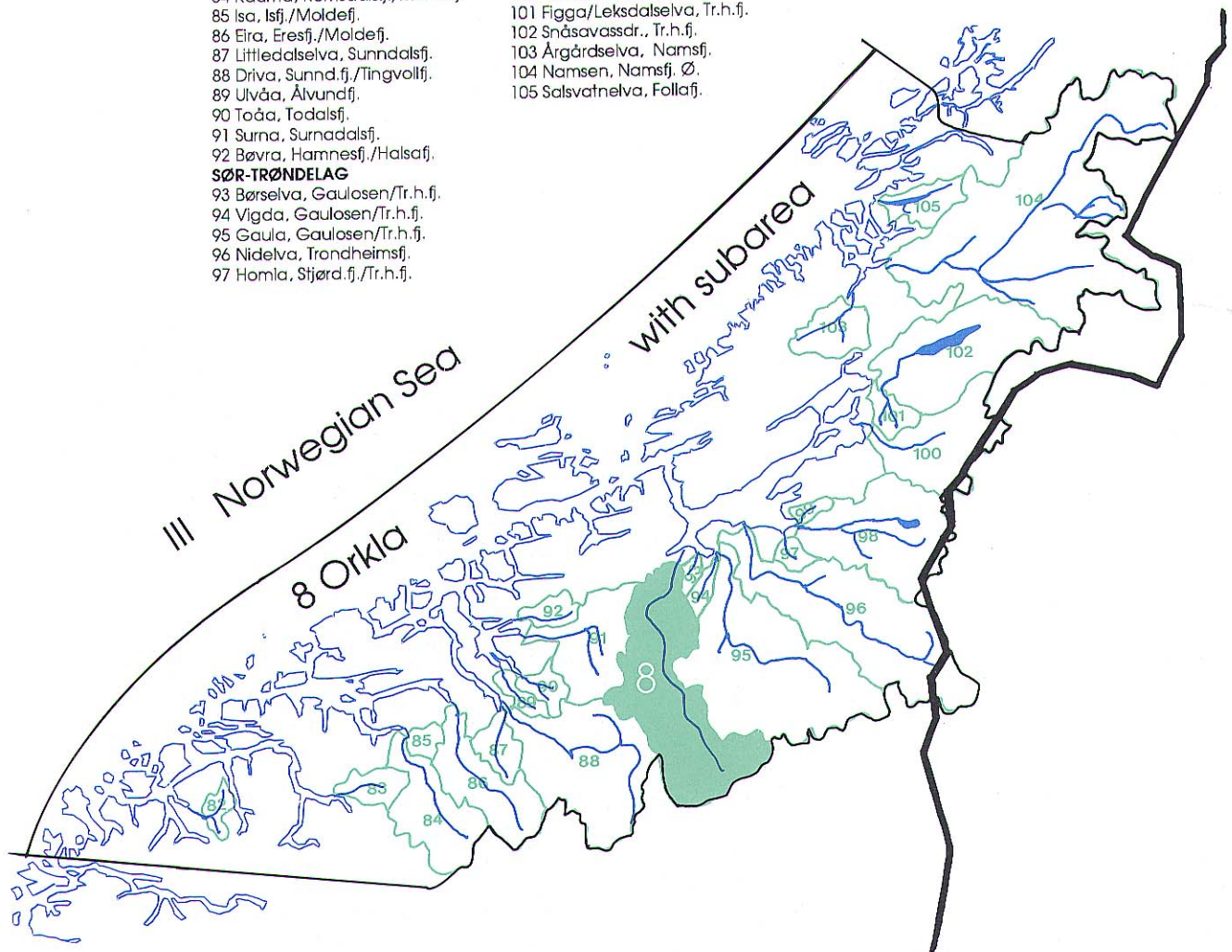
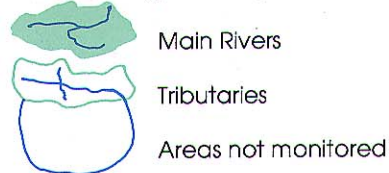


Fig. I.III A
 Main Rivers and Tributaries draining to
 The Norwegian Sea (Southern Part).



III Norwegian Sea

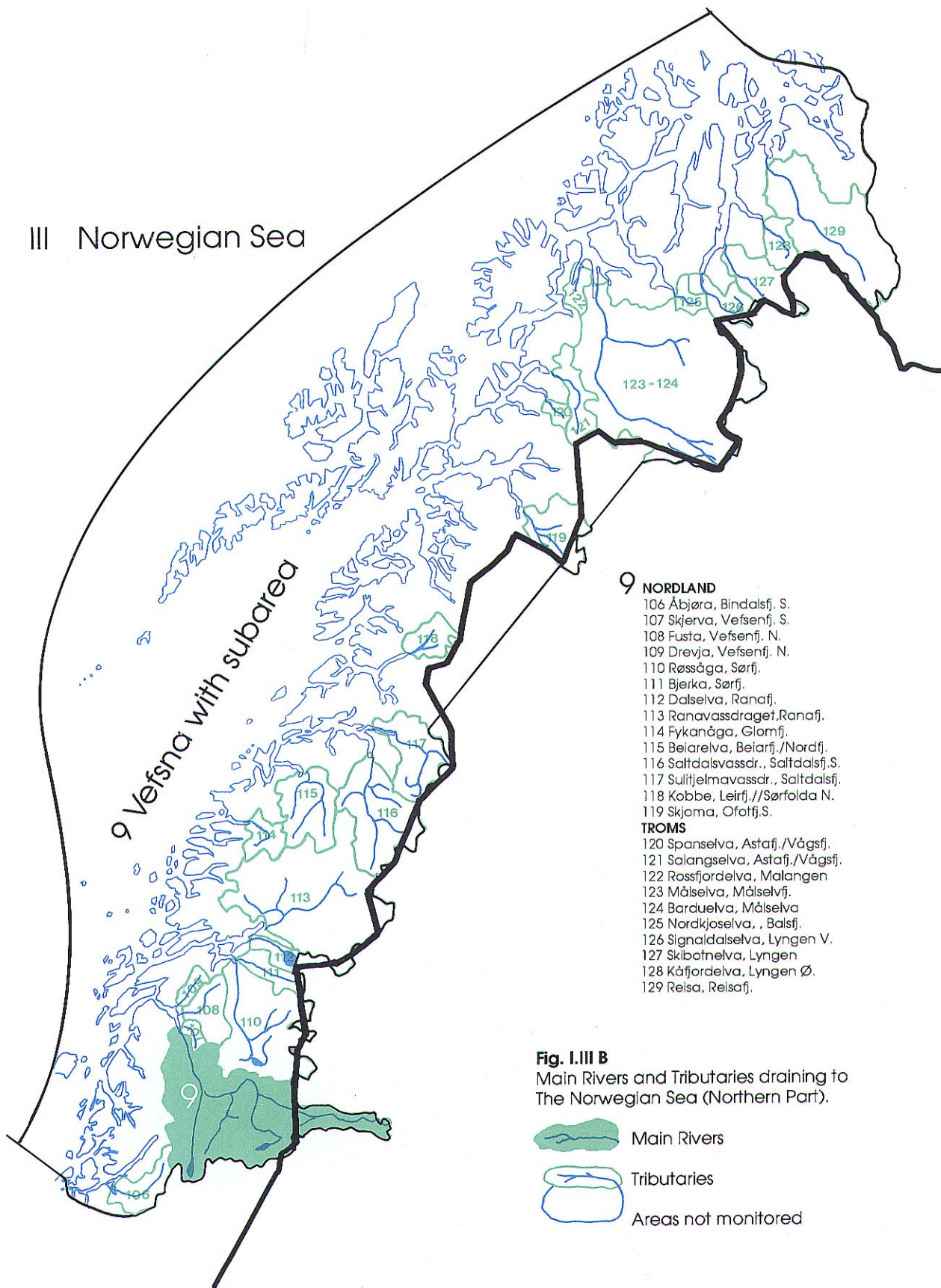


Table 1.4 TOTAL DISCHARGES to The Barents Sea 1991 (Fig. I.IV).

The Barents Sea Region with main river (10) Alta

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.01	0.5 *	0.06 *	0.6	tonnes
Cadmium			0.5 **	0.08 **	0.6	tonnes
Mercury		4.38	0 *	5.49 *	10	kg
Mercury			41 **	6.58 **	52	kg
Copper		0.61	37	3.80	41	tonnes
Zinc		0.88	102	5.82	109	tonnes
Lead		0.07	13.7 *	0.00 *	13.7	tonnes
Lead			13.7 **	0.27 **	14.0	tonnes
Arsenic		0.00			0.0	tonnes
Cr-T		0.35			0.4	tonnes
Cr-T					0.4	tonnes
PCBs ***			0.1 *	0.00 *	0.1	kg
PCBs			7.2 **	0.96 **	8.2	kg
gamma-HCH			8	0.32	8	kg
NO3-N	1013	0.19	401	131.02	532	tonnes
PO4-P	18	14.27	21	5.15	40	tonnes
Total N	1685	194.68	2784	614.50	5278	tonnes
Total P	88	24.30	117	24.84	254	tonnes
S.P.M.		1600597	23000	4804.45	1628402	tonnes
TOC		345.89		11042	11388	tonnes
DOC				10713		tonnes
COD		1539.43			12253	tonnes
BOD		711.77			712	tonnes
AOX		0.00			0	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

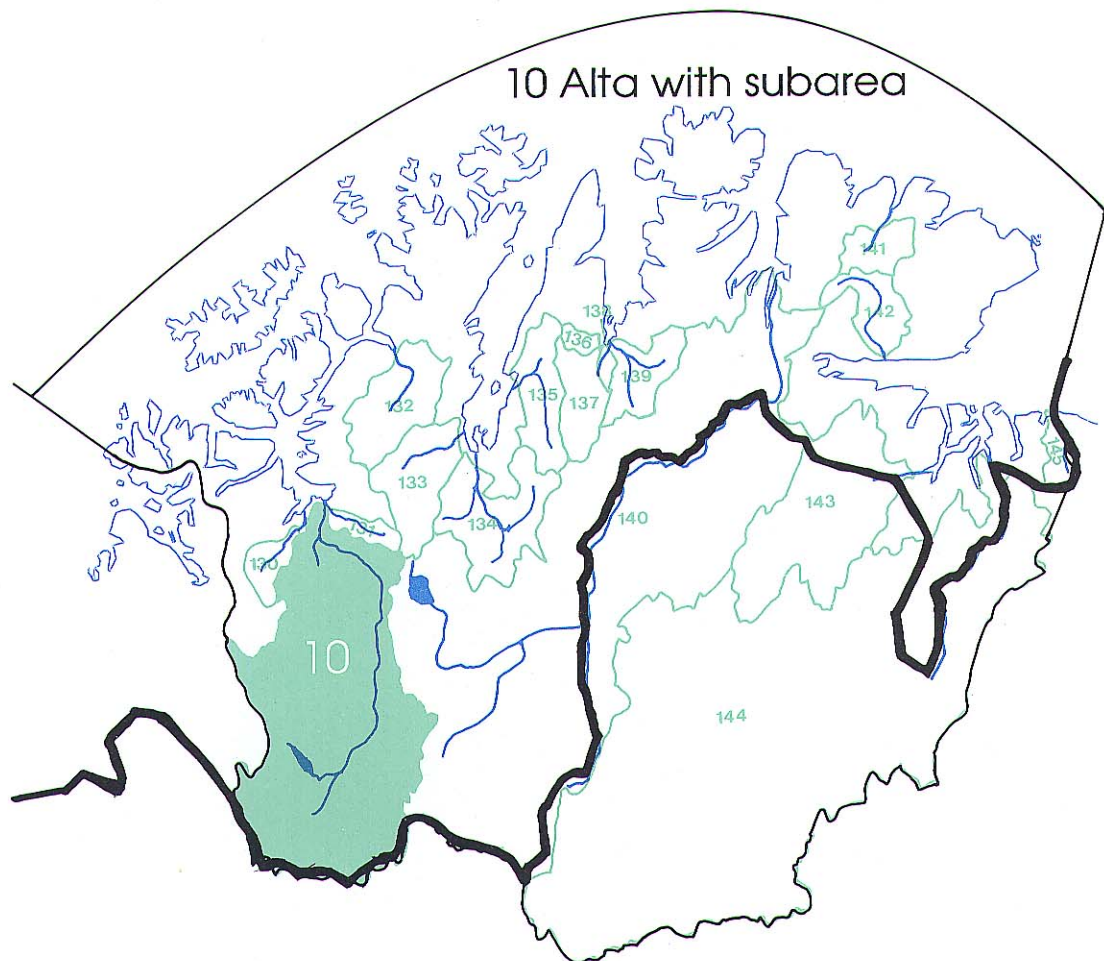


Fig. I.IV
Main Rivers and Tributaries draining to
The Barents Sea.



10 FINNMARK

- 130 Mattiselva, Kåfj./Altafj.
- 131 Tverrelva, Altafj.
- 132 Repparfjordelva, Repparfj.
- 133 Stabburselva, I. Porsangen V.
- 134 Lakselva, I. Porsangen S.
- 135 Børselva, I. Porsangen Ø.
- 136 Mattusjåkka, I. Laksefj. V.
- 137 Storelva, I. Laksefj. V.
- 138 Soussjåkka, I. Laksefj. V.
- 139 Adamselva, I. Laksefj. Ø.
- 140 Tanavassdr., Tanafj. S.
- 141 Vestrelva, Syltefj.
- 142 V. Jakobselva, Y. Varangerfj.
- 143 Neiden Munkfj./Varangerfj.
- 144 Passvikelva, Bøkfj./Varangerfj.
- 145 Grense Jakobselva, Varangerfj.

**APPENDIX II : SEWAGE EFFLUENTS FROM DOWN STREAM AREAS OF MAIN
AND TRIBUTARY RIVERS AND RIVERS NOT MONITORED
1991 (Paragraph 7 - 8)**

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Table 2.3 Sewage effluents to the Norwegian Sea region	23
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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, 1991 and 1992)

Municipal sewage includes a portion of industrial effluents

Table II Sewage Effluents from down stream areas of mainland Norway to convention waters (1991).

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	159	82	84	5	330	kg
Hg	131	68	70	4	273	kg
Cu	15.6	9.6	9.7	0.6	35.5	tonnes
Zn	24.9	13.7	13.9	0.9	53.3	tonnes
Pb	1946	1094	1114	70	4224	kg
Cr-T	7.1	5.5	5.6	0.4	18.5	tonnes
PCBs						kg
gamma-HCH						kg
NO3-N	5.1	2.7	3.2	0.2	11.2	tonnes
PO4-P	192	236	253	14	695	tonnes
Tot-N	5108	2729	3201	194	11232	tonnes
Tot-P	320	393	421	24	1158	tonnes
S.P.M.	8468	8298	9908	597	27272	tonnes
TOC	9453	5191	5967	346	20957	tonnes
COD	29199	22367	26001	1539	79106	tonnes
BOD	13876	10381	11934	692	36883	tonnes

Table 2.1 Sewage Effluents to The Skagerrak Region (1991).

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	111.8	3.6	21.5	5.3	17.0	kg	_____ %
Hg	91.0	3.0	17.9	4.5	14.2	kg	_____ %
Cu	10.0	0.4	2.5	0.6	2.0	tonnes	_____ %
Zn	17.0	0.6	3.6	0.9	2.8	tonnes	_____ %
Pb	1313	48	287	71	227	kg	_____ %
Cr-T	3.9	0.2	1.4	0.4	1.1	tonnes	_____ %
PCBs						kg	_____ %
gamma-HCH						kg	_____ %
NO3-N	3.1	0.3	0.9	0.2	0.7	tonnes	_____ %
PO4-P	38	35	54	14	51	tonnes	_____ %
Tot-N	3063	295	854	197	699	tonnes	_____ %
Tot-P	63	58	90	23	85	tonnes	_____ %
S.P.M.	3593	410	2146	361	1958	tonnes	_____ %
TOC	6311	285	1413	248	1196	tonnes	_____ %
COD	15763	1209	5978	1104	5144	tonnes	_____ %
BOD	7592	570	2827	495	2392	tonnes	_____ %

Table 2.2 Sewage Effluents to The Remaining North Sea Region (1991).

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	23.9	58.2	kg	_____ %
Hg	19.9	48.5	kg	_____ %
Cu	2.8	6.8	tonnes	_____ %
Zn	4.0	9.7	tonnes	_____ %
Pb	318.4	775.8	kg	_____ %
Cr-T	1.6	3.9	tonnes	_____ %
PCBs			kg	_____ %
gamma-HCH			kg	_____ %
NO3-N	0.9	1.8	tonnes	_____ %
PO4-P	75	161	tonnes	_____ %
Tot-N	933	1796	tonnes	_____ %
Tot-P	125	268	tonnes	_____ %
S.P.M.	2892	5407	tonnes	_____ %
TOC	1688	3503	tonnes	_____ %
COD	7121	15246	tonnes	_____ %
BOD	3375	7006	tonnes	_____ %

Table 2.3 Sewage Effluents to The Norwegian Sea Region (1991).

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	44.4	39.1	kg	_____ %
Hg	37.0	32.6	kg	_____ %
Cu	5.2	4.6	tonnes	_____ %
Zn	7.4	6.5	tonnes	_____ %
Pb	591.9	521.8	kg	_____ %
Cr-T	3.0	2.6	tonnes	_____ %
PCBs			kg	_____ %
gamma-HCH			kg	_____ %
NO3-N	1.8	1.4	tonnes	_____ %
PO4-P	143	109	tonnes	_____ %
Tot-N	1813	1388	tonnes	_____ %
Tot-P	239	182	tonnes	_____ %
S.P.M.	5138	4770	tonnes	_____ %
TOC	3197	2770	tonnes	_____ %
COD	13837	12164	tonnes	_____ %
BOD	6393	5541	tonnes	_____ %

Table 2.4 Sewage Effluents to The Barents Sea Region (1991).**The Barents Sea Region with sub-area: (10) Alta**

Total quantity of substance discharged per year:		Precision of the estimate of the load	
Sub-area :	10		
Substance:			
Cd	5.3	kg	_____ %
Hg	4.4	kg	_____ %
Cu	0.6	tonnes	_____ %
Zn	0.9	tonnes	_____ %
Pb	70.0	kg	_____ %
Cr-T	0.4	tonnes	_____ %
PCBs		kg	_____ %
gamma-HCH		kg	_____ %
NO3-N	0.2	tonnes	_____ %
PO4-P	14	tonnes	_____ %
Tot-N	194	tonnes	_____ %
Tot-P	24	tonnes	_____ %
S.P.M.	597	tonnes	_____ %
TOC	346	tonnes	_____ %
COD	1539	tonnes	_____ %
BOD	692	tonnes	_____ %

**APPENDIX III : INDUSTRIAL EFFLUENTS FROM DOWN STREAM AREAS OF MAIN
AND TRIBUTARY RIVERS AND RIVERS NOT MONITORED
1991 (Paragraph 11 - 13)** 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, 1991 and 1992)

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 (1991).

Total quantity of substance discharged per year:

Regions:	I	II	III	IV	Sum	
	The	The	The	The		
Substance:	Skagerrak	North	Norwegian	Barents		
		Sea	Sea	Sea		
Cd	1	106	7	0	114	kg
Hg	6	35	0	0	41	kg
Cu	11.1	4.9	0.0	0.0	16.0	tonnes
Zn	2.5	17.7	4.0	0.0	24.3	tonnes
Pb	392	8263	360	0	9015	kg
Arsenic	0.5	0.0	0.0	0.0	0.5	tonnes
Cr-T	1.6	2.6	90.0	0.0	94.2	tonnes
PCBs	0.0	0.0	0.0	0.0	0.0	kg
gamma-HCH	0.0	0.0	0.0	0.0	0.0	kg
NO3-N						tonnes
PO4-P						tonnes
Tot-N	2016	276	922	1	3215	tonnes
Tot-P	105	38	86	1	229	tonnes
S.P.M.	10415	1814064	1104722	1600000	4529201	tonnes
TOC	77	166	140	0	383	tonnes
COD	147193	13361	26279	0	186833	tonnes
BOD	64	1048	1425	20	2557	tonnes
AOX	1077	0	0	0	1077	tonnes

Table 3.1 Industrial Effluents to The Skagerrak Region (1991).

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

Sub-areas : Substance:	Total quantity of substance discharged per year:						Precision of the estimate of the load
	1	2	3	4	5		
Cd	1	0	0	0	0	kg	_____ %
Hg	5	0	0	0	0	kg	_____ %
Cu	8.5	0.0	0.0	0.2	2.4	tonnes	_____ %
Zn	2.1	0.0	0.0	0.1	0.3	tonnes	_____ %
Pb	227	0	1	0	164	kg	_____ %
Arsenic	0.0	0.0	0.0	0.0	0.5	tonnes	_____ %
Cr-T	1.6	0.0	0.0	0.0	0.0	tonnes	_____ %
PCBs	0.0	0.0	0.0	0.0	0.0	kg	_____ %
gamma-HCH	0.0	0.0	0.0	0.0	0.0	kg	_____ %
NO3-N						tonnes	_____ %
PO4-P						tonnes	_____ %
Tot-N	307	217	41	1451	0	tonnes	_____ %
Tot-P	44	40	5	14	2	tonnes	_____ %
S.P.M.	5148	976	1783	1448	1060	tonnes	_____ %
TOC	0	0	67	10	0	tonnes	_____ %
COD	83333	21080	28017	14546	218	tonnes	_____ %
BOD	0	0	0	0	64	tonnes	_____ %
AOX	239.0	838.0	0.0	0.2	0.0	tonnes	_____ %

Table 3.2 Industrial Effluents to The Remaining North Sea Region (1991).

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	106	kg	_____ %
Hg	0	35	kg	_____ %
Cu	0.0	4.8	tonnes	_____ %
Zn	0.0	17.7	tonnes	_____ %
Pb	0	8263	kg	_____ %
Arsenic	0	0	tonnes	_____
Cr-T	0.4	2.2	tonnes	_____
PCBs	0	0	kg	_____ %
gamma-HCH	0	0	kg	_____ %
NO3-N			tonnes	_____ %
PO4-P			tonnes	_____ %
Tot-N	22	254	tonnes	_____ %
Tot-P	3	36	tonnes	_____ %
S.P.M.	1800033	14031	tonnes	_____ %
TOC	0	166	tonnes	_____ %
COD	324	13037	tonnes	_____ %
BOD	191	857	tonnes	_____ %
AOX	0	0	tonnes	_____

Table 3.3 Industrial Effluents to The Norwegian Sea Region (1991).

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	_____ %
Arsenic	0	0	tonnes	_____
Cr-T	0.0	90.0	tonnes	_____
PCBs	0	0	kg	_____ %
gamma-HCH	0	0	kg	_____ %
NO3-N			tonnes	_____ %
PO4-P			tonnes	_____ %
Tot-N	96	826	tonnes	_____ %
Tot-P	23	63	tonnes	_____ %
S.P.M.	4066	1100656	tonnes	_____ %
TOC	20	120	tonnes	_____ %
COD	26279	0	tonnes	_____ %
BOD	919	506	tonnes	_____ %
AOX	0	0	tonnes	_____

Table 3.4 Industrial Effluents to The Barents Sea Region (1991).**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	_____ %
Arsenic	0	tonnes	_____ %
Cr-T	0.0	tonnes	_____ %
PCBs	0.0	kg	_____ %
gamma-HCH	0.0	kg	_____ %
NO3-N		tonnes	_____ %
PO4-P		tonnes	_____ %
Tot-N	1	tonnes	_____ %
Tot-P	1	tonnes	_____ %
S.P.M.	1600000	tonnes	_____ %
TOC	0	tonnes	_____ %
COD	0	tonnes	_____ %
BOD	20	tonnes	_____ %
AOX	0.0	tonnes	_____ %

APPENDIX IV : MAIN RIVERINE INPUTS 1991 (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, 1991 and 1992)

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

Table 4.1 MAIN RIVERINE INPUTS 1991 (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:	48595	1000 m3/day	Cadmium *	0.3 tonnes		YES	%
Minimum flow	24365	1000 m3/day	Cadmium **	0.4 tonnes			%
Maximum flow	119578	1000 m3/day	Mercury *	23.6 kg		NO	%
			Mercury **	41.8 kg			%
			Copper	31.4 tonnes		YES	%
			Zinc	103.6 tonnes		YES	%
			Lead *	6.4 tonnes		YES	%
			Lead **	6.5 tonnes			%
			Arsenic	5.1 tonnes		YES	%
			Total Cr-T *	0.0 tonnes		NO	%
			Total Cr-T **	8.9 tonnes			%
			PCBs *	0.6 kg		NO	%
			PCBs **	6.4 kg			%
			gamma-HCH (lindane)	16.0 kg		YES	%
			Nitrates (NO ₃ -N)	6701 tonnes		YES	%
			Orthophosphates (PO ₄ -P)	166 tonnes		YES	%
			Total N	10398 tonnes		YES	%
			Total P	401 tonnes		YES	%
			Suspended Particulate Matter	120159 tonnes		YES	%
			Others :				
			TOC	67439 tonnes		YES	%
			DOC	66254 tonnes		YES	%
			AOX	70.9 tonnes		YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.2 MAIN RIVERINE INPUTS 1991 (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:	19268	1000 m3/day	Cadmium *	0.1 tonnes		NO	%
Minimum flow	5530	1000 m3/day	Cadmium **	0.1 tonnes			%
Maximum flow	28512	1000 m3/day	Mercury *	5.7 kg		NO	%
			Mercury **	14.9 kg			%
			Copper	8.2 tonnes		YES	%
			Zinc	35.6 tonnes		YES	%
			Lead *	2.0 tonnes		YES	%
			Lead **	2.0 tonnes			%
			Arsenic	1.9 tonnes		YES	%
			Total Cr-T *	0.0 tonnes		NO	%
			Total Cr-T **	3.5 tonnes			%
			PCBs *	0.0 kg		NO	%
			PCBs **	2.5 kg			%
			gamma-HCH (lindane)	4.8 kg		YES	%
			Nitrates (NO ₃ -N)	1727 tonnes		YES	%
			Orthophosphates (PO ₄ -P)	12 tonnes		YES	%
			Total N	2667 tonnes		YES	%
			Total P	38 tonnes		YES	%
			Suspended Particulate Matter	11425 tonnes		YES	%
			Others :				
			TOC	16106 tonnes		YES	%
			DOC	tonnes			%
			AOX	36.3 tonnes		YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.3 MAIN RIVERINE INPUTS 1991 (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:	7715	1000 m3/day	Cadmium *	0.1 tonnes		NO	%
Minimum flow	1296	1000 m3/day	Cadmium **	0.1 tonnes			%
Maximum flow	22637	1000 m3/day	Mercury *	2.8 kg		NO	%
			Mercury **	6.1 kg			%
			Copper	5.1 tonnes		YES	%
			Zinc	28.6 tonnes		YES	%
			Lead *	2.2 tonnes		YES	%
			Lead **	2.3 tonnes			%
			Arsenic	tonnes			%
			Total Cr-T *	tonnes			%
			Total Cr-T **	tonnes			%
			PCBs *	0.1 kg		NO	%
			PCBs **	1.0 kg			%
			gamma-HCH (lindane)	1.1 kg		YES	%
			Nitrates (NO3-N)	608 tonnes		YES	%
			Orthophosphates (PO4-P)	16 tonnes		YES	%
			Total N	1075 tonnes		YES	%
			Total P	32 tonnes		YES	%
			Suspended Particulate Matter	15404 tonnes		YES	%
			Others : TOC	9876 tonnes		YES	%
			DOC	tonnes			%
			AOX	tonnes			%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.4 MAIN RIVERINE INPUTS 1991 (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:	16397	1000 m3/day	Cadmium *	0.1 tonnes		NO	_____	%
Minimum flow	2160	1000 m3/day	Cadmium **	0.1 tonnes			_____	%
Maximum flow	41213	1000 m3/day	Mercury *	22.9 kg		NO	_____	%
			Mercury **	28.3 kg			_____	%
			Copper	8.4 tonnes		YES	_____	%
			Zinc	43.9 tonnes		YES	_____	%
			Lead *	1.5 tonnes		YES	_____	%
			Lead **	1.5 tonnes			_____	%
			Arsenic	0.9 tonnes		YES	_____	%
			Total Cr-T *	0.0 tonnes		NO	_____	%
			Total Cr-T **	3.0 tonnes			_____	%
			PCBs *	0.0 kg		NO	_____	%
			PCBs **	2.1 kg			_____	%
			gamma-HCH (lindane)	4.1 kg		YES	_____	%
			Nitrates (NO3-N)	1546 tonnes		YES	_____	%
			Orthophosphates (PO4-P)	9 tonnes		YES	_____	%
			Total N	2353 tonnes		YES	_____	%
			Total P	25 tonnes		YES	_____	%
			Suspended Particulate Matter	5442 tonnes		YES	_____	%
			Others :					
			TOC	9935 tonnes		YES	_____	%
			DOC	tonnes			_____	%
			AOX	29.9 tonnes		YES	_____	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.5 MAIN RIVERINE INPUTS 1991 (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:	11586	1000 m3/day	Cadmium *	0.2 tonnes		NO	%
Minimum flow	4406	1000 m3/day	Cadmium **	0.2 tonnes			%
Maximum flow	24365	1000 m3/day	Mercury *	0.0 kg		NO	%
			Mercury **	8.5 kg			%
			Copper	4.5 tonnes		YES	%
			Zinc	33.2 tonnes		YES	%
			Lead *	1.5 tonnes		YES	%
			Lead **	1.6 tonnes			%
			Arsenic	1.0 tonnes		YES	%
			Total Cr-T *	0.8 tonnes		NO	%
			Total Cr-T **	2.3 tonnes			%
			PCBs *	0.8 kg		NO	%
			PCBs **	2.0 kg			%
			gamma-HCH (lindane)	1.6 kg		YES	%
			Nitrates (NO3-N)	530 tonnes		YES	%
			Orthophosphates (PO4-P)	7 tonnes		YES	%
			Total N	1060 tonnes		YES	%
			Total P	22 tonnes		YES	%
			Suspended Particulate Matter	7049 tonnes		YES	%
			Others : TOC	17720 tonnes		YES	%
			DOC	tonnes			%
			AOX	311.8 tonnes		YES	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.6 MAIN RIVERINE INPUTS 1991 (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:	301	1000 m3/day	Cadmium *	0.01	tonnes	YES	_____ %
Minimum flow	16	1000 m3/day	Cadmium **	0.01	tonnes		_____ %
Maximum flow	981	1000 m3/day	Mercury *	0.10	kg	NO	_____ %
			Mercury **	0.25	kg		_____ %
			Copper	0.19	tonnes	YES	_____ %
			Zinc	0.53	tonnes	YES	_____ %
			Lead *	0.06	tonnes	YES	_____ %
			Lead **	0.06	tonnes		_____ %
			Arsenic		tonnes		_____ %
			Total Cr-T *		tonnes		_____ %
			Total Cr-T **		tonnes		_____ %
			PCBs *	0.00	kg	NO	_____ %
			PCBs **	0.04	kg		_____ %
			gamma-HCH (lindane)	0.08	kg	YES	_____ %
			Nitrates (NO ₃ -N)	92	tonnes	YES	_____ %
			Orthophosphates (PO ₄ -P)	3.4	tonnes	YES	_____ %
			Total N	180	tonnes	YES	_____ %
			Total P	9.9	tonnes	YES	_____ %
			Suspended Particulate Matter	1367	tonnes	YES	_____ %
			Others :				
			TOC	637	tonnes	YES	_____ %
			DOC	529	tonnes	YES	_____ %
			AOX		tonnes		_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.7 MAIN RIVERINE INPUTS 1991 (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:	4847	1000 m3/day	Cadmium *	0.02	tonnes	YES	_____ %
Minimum flow	1296	1000 m3/day	Cadmium **	0.02	tonnes		_____ %
Maximum flow	18317	1000 m3/day	Mercury *	0.00	kg	NO	_____ %
			Mercury **	3.54	kg		_____ %
			Copper	0.92	tonnes	YES	_____ %
			Zinc	4.88	tonnes	YES	_____ %
			Lead *	0.07	tonnes	NO	_____ %
			Lead **	0.21	tonnes		_____ %
			Arsenic	0.27	tonnes	YES	_____ %
			Total Cr-T *	0.00	tonnes	NO	_____ %
			Total Cr-T **	0.88	tonnes		_____ %
			PCBs *	0.00	kg	NO	_____ %
			PCBs **	0.62	kg		_____ %
			gamma-HCH (lindane)	1.97	kg	YES	_____ %
			Nitrates (NO3-N)	296	tonnes	YES	_____ %
			Orthophosphates (PO4-P)	1.53	tonnes	YES	_____ %
			Total N	379	tonnes	YES	_____ %
			Total P	4.20	tonnes	YES	_____ %
			Suspended Particulate Matter	1338	tonnes	YES	_____ %
			Others :				
			TOC		tonnes		_____ %
			DOC		tonnes		_____ %
			AOX	4.62	tonnes	YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.8 MAIN RIVERINE INPUTS 1991 (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:	5312	1000 m3/day	Cadmium *	0.1 tonnes	YES	_____ %
Minimum flow	1555	1000 m3/day	Cadmium **	0.1 tonnes		_____ %
Maximum flow	50976	1000 m3/day	Mercury *	2.0 kg	NO	_____ %
			Mercury **	5.1 kg		_____ %
			Copper	23.7 tonnes	YES	_____ %
			Zinc	49.6 tonnes	YES	_____ %
			Lead *	0.4 tonnes	YES	_____ %
			Lead **	0.4 tonnes		_____ %
			Arsenic	tonnes		_____ %
			Total Cr-T *	tonnes		_____ %
			Total Cr-T **	tonnes		_____ %
			PCBs *	0.0 kg	NO	_____ %
			PCBs **	0.7 kg		_____ %
			gamma-HCH (lindane)	0.3 kg	YES	_____ %
			Nitrates (NO3-N)	299 tonnes	YES	_____ %
			Orthophosphates (PO4-P)	4 tonnes	YES	_____ %
			Total N	634 tonnes	YES	_____ %
			Total P	12 tonnes	YES	_____ %
			Suspended Particulate Matter	3533 tonnes	YES	_____ %
			Others :			
			TOC	7025 tonnes	YES	_____ %
			DOC	tonnes		_____ %
			AOX	tonnes		_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.9 MAIN RIVERINE INPUTS 1991 (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:	14625	1000 m3/day	Cadmium *	0.4 tonnes		NO	_____	%
Minimum flow	3231	1000 m3/day	Cadmium **	0.4 tonnes			_____	%
Maximum flow	67031	1000 m3/day	Mercury *	2.5 kg		NO	_____	%
			Mercury **	12.2 kg			_____	%
			Copper	8.8 tonnes		YES	_____	%
			Zinc	26.1 tonnes		YES	_____	%
			Lead *	1.7 tonnes		YES	_____	%
			Lead **	1.8 tonnes			_____	%
			Arsenic	tonnes			_____	%
			Total Cr-T *	tonnes			_____	%
			Total Cr-T **	tonnes			_____	%
			PCBs *	0.0 kg		NO	_____	%
			PCBs **	1.9 kg			_____	%
			gamma-HCH (lindane)	1.3 kg		YES	_____	%
			Nitrates (NO ₃ -N)	327 tonnes		YES	_____	%
			Orthophosphates (PO ₄ -P)	8 tonnes		YES	_____	%
			Total N	786 tonnes		YES	_____	%
			Total P	21 tonnes		YES	_____	%
			Suspended Particulate Matter	12759 tonnes		YES	_____	%
			Others :					
			TOC	9412 tonnes		YES	_____	%
			DOC	tonnes			_____	%
			AOX	tonnes			_____	%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

Table 4.10 MAIN RIVERINE INPUTS 1991 (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:	7507	1000 m3/day	Cadmium *	0.06	tonnes	NO	%
Minimum flow	2581	1000 m3/day	Cadmium **	0.08	tonnes		%
Maximum flow	24650	1000 m3/day	Mercury *	5.49	kg	NO	%
			Mercury **	6.58	kg		%
			Copper	3.80	tonnes	YES	%
			Zinc	5.82	tonnes	YES	%
			Lead *	0.00	tonnes	NO	%
			Lead **	0.27	tonnes		%
			Arsenic		tonnes		%
			Total Cr-T *		tonnes		%
			Total Cr-T **		tonnes		%
			PCBs *	0.00	kg	NO	%
			PCBs **	0.96	kg		%
			gamma-HCH (lindane)	0.32	kg	YES	%
			Nitrates (NO3-N)	131	tonnes	YES	%
			Orthophosphates (PO4-P)	5.2	tonnes	YES	%
			Total N	614	tonnes	YES	%
			Total P	25	tonnes	YES	%
			Suspended Particulate Matter	4804	tonnes	YES	%
			Others :				
			TOC	11042	tonnes	YES	%
			DOC	10713	tonnes	YES	%
			AOX		tonnes		%

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

APPENDIX V : INPUTS FROM TRIBUTARY RIVERS 1991 (Paragraph 17-19)	Page:
Table 5.1 Tributary rivers in the sub-areas (1-5). The Skagerrak area	43
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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, 1991 and 1992)

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 1991 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 ?	Precisio of the estimate of the load	
Sub-areas :	1A	1B	2	3	4	5			
Substance:									
Cd *	0.10	0.06	0.00	0.02	0.07	1.03	tonnes	YES	_____ %
Cd **	0.10	0.06	0.00	0.02	0.07	1.03	tonnes		_____ %
Hg *	0.12	0.00	0.00	0.00	0.00	26.31	kg	NO	_____ %
Hg **	1.98	0.82	0.35	1.19	1.47	32.50	kg		_____ %
Cu	1.5	4.3	0.3	0.9	1.2	7.6	tonnes	YES	_____ %
Zn	4.9	8.5	2.1	3.6	12.6	113.1	tonnes	YES	_____ %
Pb *	0.36	1.33	0.04	0.34	0.18	5.76	tonnes	YES	_____ %
Pb **	0.36	1.33	0.04	0.34	0.18	5.76	tonnes		_____ %
PCBs *	0.00	0.00	0.00	0.00	0.00	0.00	kg	NO	_____ %
PCBs **	0.34	6.06	0.13	0.01	0.26	3.01	kg		_____ %
gamma-HCH	3.83	0.97	0.43	0.41	3.88	38.07	kg	YES	_____ %
NO3-N	684	234	156	555	198	1748	tonnes	YES	_____ %
PO4-P	5.3	5.4	8.7	4.6	0.7	5.8	tonnes	YES	_____ %
Total N	1130	511	219	736	314	3180	tonnes	YES	_____ %
Total P	22	19	13	13	3	59	tonnes	YES	_____ %
S.P.M.	2534	3727	615	1458	947	11559	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 1991 in The Subareas (6-7).

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 *	0.27	0.76	tonnes YES	_____ %
Cd **	0.34	0.90	tonnes	_____ %
Hg *	0.00	0.00	kg NO	_____ %
Hg **	29.68	58.36	kg	_____ %
Cu	25.7	26.3	tonnes YES	_____ %
Zn	98.9	95.4	tonnes YES	_____ %
Pb *	8.71	9.13	tonnes YES	_____ %
Pb **	8.71	9.93	tonnes	_____ %
PCBs *	0.00	0.00	kg NO	_____ %
PCBs **	5.19	10.21	kg	_____ %
gamma-HCH	79.37	60.02	kg YES	_____ %
NO3-N	3998	3749	tonnes YES	_____ %
PO4-P	29.9	24.8	tonnes YES	_____ %
Total N	5508	5651	tonnes YES	_____ %
Total P	104	129	tonnes YES	_____ %
S.P.M.	14233	21522	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 1991 in the Subareas (8-9).

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 *	2.56	0.91	tonnes YES	_____ %
Cd **	2.58	0.91	tonnes	_____ %
Hg *	9.53	0.00	kg NO	_____ %
Hg **	74.15	65.40	kg	_____ %
Cu	52.1	53.0	tonnes YES	_____ %
Zn	101.8	86.3	tonnes YES	_____ %
Pb *	18.55	14.26	tonnes YES	_____ %
Pb **	18.55	14.26	tonnes	_____ %
PCBs *	0.00	0.17	kg NO	_____ %
PCBs **	12.42	11.45	kg	_____ %
gamma-HCH	17.92	16.65	kg YES	_____ %
NO3-N	3572	1162	tonnes YES	_____ %
PO4-P	54.9	46.7	tonnes YES	_____ %
Total N	7193	2585	tonnes YES	_____ %
Total P	205	141	tonnes YES	_____ %
S.P.M.	72369	97871	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 1991 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 *	0.48	tonnes YES	_____ %
Cd **	0.50	tonnes	_____ %
Hg *	0.00	kg NO	_____ %
Hg **	41.34	kg	_____ %
Cu	36.8	tonnes YES	_____ %
Zn	102.0	tonnes YES	_____ %
Pb *	13.65	tonnes YES	_____ %
Pb **	13.65	tonnes	_____ %
PCBs *	0.12	kg NO	_____ %
PCBs **	7.24	kg	_____ %
gamma-HCH	7.52	kg YES	_____ %
NO3-N	401	tonnes YES	_____ %
PO4-P	21.0	tonnes YES	_____ %
Total N	2784	tonnes YES	_____ %
Total P	117	tonnes YES	_____ %
S.P.M.	23000	tonnes YES	_____ %

Measurements below detection limits are treated in two ways :

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

APPENDIX VI : OTHER INPUTS 1991**(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 drainage from silos, manures etc.

Paragraph 3.3 (Report A, 1991 and 1992)

Table 6.1 Nutrients from "Down Stream Areas" of main and tributary rivers and rivers not monitored 1991.

Direct runoff of P and N :

Sub-areas :		Back-ground tons	Agriculture		Sum tons
			Area tons	Point tons	
1 Glomma	Tot-P	18.3	12.5	0.7	31
	Tot-N	464.7	552.7	9.3	1027
	PO4-P	3.7	3.8	0.5	8
	NO3-N	278.8	386.9	1.1	667
1 Inner Oslofjord	Tot-P	3.3	1.8	0.5	6
	Tot-N	71.4	84.5	5.1	161
	PO4-P	0.7	0.5	0.4	2
	NO3-N	42.8	59.2	0.6	103
2 Drammenselva	Tot-P	1.5	2.0	0.0	4
	Tot-N	63.9	71.1	0.3	135
	PO4-P	0.3	0.6	0.0	1
	NO3-N	38.3	49.8	0.0	88
3 Numedalslågen	Tot-P	4.9	10.8	0.2	16
	Tot-N	186.4	474.9	1.0	662
	PO4-P	1.0	3.2	0.1	4
	NO3-N	111.9	332.5	0.1	444
4 Skienselva	Tot-P	7.5	2.2	0.2	10
	Tot-N	334.9	92.7	3.8	431
	PO4-P	1.5	0.7	0.1	2
	NO3-N	200.9	64.9	0.5	266
5 Otra	Tot-P	11.1	4.4	0.9	16
	Tot-N	348.8	133.5	10.6	493
	PO4-P	2.2	1.3	0.6	4
	NO3-N	209.3	93.4	1.3	304
6 Orreelva	Tot-P	22.9	43.4	4.8	71
	Tot-N	1467.2	1277.1	53.7	2798
	PO4-P	4.6	13.0	3.3	21
	NO3-N	880.3	894.0	6.4	1781
7 Suldalslågen	Tot-P	58.0	62.3	7.5	128
	Tot-N	5157.3	1266.5	96.3	6520
	PO4-P	11.6	18.7	5.2	35
	NO3-N	3094.4	886.5	11.6	3992
8 Orkla	Tot-P	142.2	139.8	14.9	297
	Tot-N	3852.7	3445.1	196.2	7494
	PO4-P	28.4	41.9	10.3	81
	NO3-N	2311.6	2411.6	23.5	4747
9 Vefsna	Tot-P	83.8	32.4	7.7	124
	Tot-N	1921.4	827.8	103.6	2853
	PO4-P	16.8	9.7	5.3	32
	NO3-N	1152.8	579.5	12.4	1745
10 Alta	Tot-P	85.9	1.5	0.6	88
	Tot-N	1617.8	59.6	7.5	1685
	PO4-P	17.2	0.5	0.4	18
	NO3-N	970.7	41.7	0.9	1013
			Sum P	791	
			Sum N	24259	
			Sum PO4-P	208	
			Sum NO3-N	15150	

APPENDIX VII : MAIN RIVERS 1 - 10. MEASURED CONCENTRATIONS 1991

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Table 7B Metals, chlorinated organic compounds, organotin compounds.

Watercourse	Date	Metals			Chlorinated organic compounds							Organotin compounds			
		Arsenic µg/l	Total Chromium µg/l	AOX µg/l	Pentachloro- phenol ng/l	Tetrachloro- ethene ng/l	Trichloro- benzene ng/l	Trichloro- ethane ng/l	Trichloro- ethene ng/l	Monobutyltin ng/l	Dibutyltin ng/l	Tributyltin ng/l			
1. Glomma	910605	0,24	<0,5	4,0	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	910717	0,30	<0,5	4,0	"	"	"	"	"	"	"	"	"	"	"
	910814	0,31	<0,5	4,0	"	"	"	"	"	"	"	"	"	n.d.	n.d.
2. Drammenselva	910605	0,24	<0,5	5,0	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	910712	0,35	<0,5	4,0	"	"	"	"	"	"	"	"	"	"	"
	910812	0,22	<0,5	7,0	"	"	"	"	"	"	"	"	"	n.d.	n.d.
4. Skienselva	910604	0,14	<0,5	5,0	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	910715	0,20	<0,5	5,0	"	"	"	"	"	"	"	"	"	"	"
	910812	0,18	<0,5	5,0	"	"	"	"	"	"	"	"	"	n.d.	n.d.
5. Otra	910604	0,19	<0,5	17,0	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	910715	0,35	<0,5	166,0	"	"	"	"	"	"	"	"	"	"	"
	910812	0,22	0,7	79,0	"	"	"	"	"	"	"	"	"	n.d.	n.d.
7. Suldalslågen	910603	0,14	<0,5	2,0	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	910716	0,15	<0,5	3,0	"	"	"	"	"	"	"	"	"	"	"
	910813	0,18	<0,5	3,0	"	"	"	"	"	"	"	"	"	n.d.	n.d.
Detection limit		<0,1	0,5	10	2	2	4	2	2	2	2	2	110	20	15

AOX = adsorbable organic halogens

n.d. = not detected

APPENDIX VIII : TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1991

Table 8.1	Cond., Nutrients, Heavy metals, Suspended part.matter	62-68
Table 8.2	Mercury, Lindane, PCBs	70-76

(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.

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1991.

County	Watercourse	Runoff data										Parameters (mean values)							S.P.M. mg/l'		
		Drainage area		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
		Outlet station kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal 1/s kv.km	1991 Normal 1/s kv.km	1991 Normal 1/s kv.km	1991 Normal 1/s kv.km	1991 Normal 1/s kv.km	1991 Normal 1/s kv.km	1991 Normal 1/s kv.km										
Østfold (1.)	Tista. Iddefj.	1588	1582	1582	14.4	12.4	14.4	14.4	12.4	14.4	14.4	6.01	2.0	825	600	1.5	5.1	0.14	0.40	1.08	
	Mosselva. Mossesundet	690	689	689	14.5	14.3	14.5	14.5	14.3	14.5	14.5	9.56	4.0	1057	200	1.3	4.8	0.05	0.30	3.74	
Oslo & Akershus (1.)	Hjølenelva. Drøbaksundet Ø	137	121		14.0	12.9						28.50	57.0	5920	5100	4.3	5.4	0.05	0.30	14.30	
	Årungenelva. I. Oslofj.	52	50		13.0	12.8						21.30	10.0	2596	700	1.3	1.3	0.05	0.30	4.96	
	Gjersjøelva. I. Oslofj.	86	85	85	14.0	7.4			7.4			15.90	2.8	1564	978	1.8	4.5	0.17	0.30	3.03	
	Ljanselva. I. Oslofj.	42	41	41	13.0	10.1			10.1			20.80	20.0	1512	650	10.0	25.0	0.20	0.30	12.90	
	Loelva/Alna. I. Oslofj.	75	69	69	13.0	17.5			17.5			28.20	185.0	2242	690	20.0	30.0	0.30	18.00	47.00	
	Akerselva. I. Oslofj.	227	225	225	17.5	9.2			9.2			8.00	3.0	687	330	20.0	50.0	0.20	3.80	3.80	
	Frognereelva. I. Oslofj.	23	20	20	15.0	29.6			29.6			17.80	44.0	1383	460	20.0	60.0	0.09	2.60	8.50	
	Lysakerelva. I. Oslofj.	178	173	173	16.8	18.0			16.8			9.80	3.0	669	270	10.0	10.0	0.04	0.50	3.80	
	Sandvikselva. I. Oslofj.	223	187	187	18.4	13.4			18.4		13.4	14.26	10.0	1163	967	4.5	13.0	0.20	3.00	6.23	
	Åroselva. I. Oslofj.	113	109	109	17.0	16.3			17.0			5.55	15.0	1686	590	5.0	10.0	0.20	0.50	6.00	
Buskerud (2.)	Lierelva. Drammensfj. Ø	309	266	222	18.6	20.7			18.6	20.7	13.80	74.0	1263	900	2.0	12.1	<0.01	0.25	3.54		
Vestfold (3.)	Sandeelva. Sandebukta	193	190		17.0	15.3			17.0		50.00	8.0	2030	1700	1.8	9.0	0.16	1.00	3.24		
	Aulielva. Tønsbergfj.	363	362	362	14.9	12.7			14.9		24.10	20.0	2307	1672	1.4	7.0	0.04	0.50	6.78		
	Farriselva. Larvikfj.	491	491	491	21.6	23.0			21.6		3.96	8.7	606	439	1.5	5.0	0.01	0.50	0.50		
Telemark (4.)	Tokkeelva. Kragerø	1238	1200	1200	26.7	19.4			26.7	19.4	3.21	4.0	428	270	1.7	17.2	0.10	0.25	1.29		
Aust- Agder (5.)	Gjerstadelva. Søndeledfj.	419	414	291	27.0	21.9			27.0	21.9	3.16	5.0	404	200	1.6	9.8	0.14	0.30	1.04		
	Vegårdselva. Sandnesfj.	457	429	291	29.3	23.4			29.3	23.4	3.93	2.0	482	240	0.6	30.0	<0.01	0.30	1.91		
	Nidelva. Arendal	4025	4020	3956	29.8	25.7			29.8	25.7	2.85	5.0	393	255	0.6	12.5	0.12	0.80	0.92		

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1991.

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	1991 1/s kv.km	Normal 1/s kv.km	1991 1/s kv.km												
Vest- Agder (5.)	Tovdalselva. Topdalsfj.	1856	1854	1794	33.9	28.4	33.9	28.4	2.64	6.0	0.5	335	143	0.5	16.2	0.02	0.60	1.65	
	Søgneelva. Fiekerøy	204	192	192	38.0	34.4	38.0	34.4	5.41	9.0	1.3	596	430	1.3	20.0	0.07	0.70	1.77	
	Mandalselva. Mannefj.	1809	1800	1740	46.0	39.7	47.6	43.1	2.88	10.0	1.6	329	150	1.6	10.4	0.21	0.70	1.41	
	Audna. Sniksfj.	450	400	59	45.0	49.5	51.8	51.8	4.64	7.0	0.5	335	190	0.5	8.9	0.12	0.40	2.20	
	Lygna. Lyngdalsfj.	664	660	266	48.0	50.4	57.9	64.3	3.75	7.0	0.5	335	190	0.5	8.9	<0.01	0.60	1.07	
	Kvina. Fedafj.	1445	1140	1140	57.6	16.0	57.6	16.0	3.53	8.0	2.0	300	125	1.8	8.9	0.03	0.80	1.84	
	Sira. Åna-Sira	1916	1872	1872	59.4	92.1	59.4	92.1	2.39	4.0	0.5	288	205	2.6	6.5	<0.01	0.70	0.62	
	Rogaland (6.)	Sokndalselva. Sogndalsstr.	294	293	107	51.1	53.0	51.1	53.0	4.54	6.0	0.5	381	285	1.8	7.6	0.10	0.40	0.76
		Hellelandselva. Egersund	241	240	194	57.5	61.3	71.1	80.4	3.56	9.0	2.0	434	335	0.5	7.7	<0.01	0.40	0.87
		Bjerkreimselva. Egersund	705	704	633	77.7	68.8	86.4	78.9	3.27	5.0	1.0	399	335	1.3	7.6	0.02	0.40	0.64
		Håelva. Håtangen	165	160	135	46.9	52.1	46.9	52.1	7.73	43.0	31.0	1260	980	1.7	13.9	0.27	0.80	4.60
		Figgjo. Solavika	229	218	127	50.0	58.3	50.0	58.3	7.66	33.0	23.0	1290	1020	1.4	16.4	0.02	1.20	4.60
		Ims-Lutsi. Høgsfj. Boknafj.	127	127	127	34.9	38.7	34.9	34.9	7.00	10.0	2.6	750	580	1.8	2.0	0.02	0.50	3.00
Oltdalse..Høgsfj. Boknafj.		102	101	129	70.0	76.3	70.0	70.0	5.00	54.0	8.0	560	260	1.8	4.0	0.02	1.00	3.00	
Dirdalse.. Høgsfj. Boknafj.		158	158	95	83.0	89.6	83.0	83.0	2.40	3.0	1.0	310	180	3.7	8.1	0.02	1.50	2.00	
Fraforde..Frafj. Boknafj.		178	178	124	94.4	101.9	94.4	94.4	2.50	4.0	1.0	310	200	1.0	4.0	0.02	0.30	0.50	
Espedalse..Høgsfj. Boknafj.		138	138	124	90.0	98.1	90.0	90.0	2.50	4.0	1.0	310	200	1.0	4.0	0.02	0.30	0.50	
(7.)	Lysee.. Lysefj. Boknafj.	182	182	46	74.0	85.1	74.0	74.0	2.50	4.0	1.0	310	200	1.0	4.0	0.02	0.30	0.50	
	Årdalse..Årdalsfj. Boknafj.	519	516	501	81.4	32.8	81.4	81.4	2.56	4.0	0.5	356	310	0.6	3.9	0.02	0.30	0.30	
	Førre.. Jøsenfj. Boknafj.	163	163	163	85.8	103.0	85.8	85.8	2.50	4.0	0.5	300	250	1.0	4.0	0.02	0.30	0.50	
	Ulla. Jøsenfj. Boknafj.	393	393	385	83.4	100.0	83.4	83.4	2.50	4.0	0.5	300	250	1.0	4.0	0.02	0.30	0.50	
	Saudae.. Saudafj. Boknafj.	353	353	353	85.0	98.6	85.0	85.0	2.10	3.0	1.0	280	220	1.0	3.0	0.02	0.30	0.50	
	Åbøelva. Saudafj. Boknafj.	82	82	82	85.0	98.6	85.0	85.0	2.10	3.0	1.0	280	220	1.0	3.0	0.02	0.30	0.50	
	Vikedalse.. Boknafj.	118	117	117	80.0	91.2	80.0	80.0	2.97	8.0	0.5	320	245	0.7	4.4	0.02	0.30	1.10	

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1991.

County	Watercourse	Runoff data										Parameters (mean values)									
		Drainage area					Discharge					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 1/s kv.km	1991 1/s kv.km	Normal 1/s kv.km	1991 1/s kv.km	gauging station												
Hordaland (7.)	Etneelva, Etnefj, Bømlafj.	252	250	127	48.8	56.6	96.0	108.7	2.90	5.6	0.5	412	230	0.8	4.9	0.02	0.50	1.00			
	Opo, Sørfj, Hardangerfj.	482	480	464	79.3	81.9	79.3	81.9	1.50	5.0	0.5	207	133	0.9	6.9	0.02	0.40	1.06			
	Tysso, Sørfj, Hardangerfj.	388	385	407	79.3	80.9	79.3	80.9	1.50	3.0	1.0	150	113	0.8	3.6	0.11	0.60	0.39			
	Kinso, Sørfj, Hardangerfj.	281	281	232	46.0	48.3	46.0	48.3	2.16	3.0	0.5	116	79	2.7	1.0	0.12	0.40	0.54			
	Veig, Eidfjv, Hardangerfj.	496	496	386	41.8	29.2	41.8	29.2	2.30	3.0	0.5	150	80	0.6	3.0	<0.01	<0.10	0.50			
	Bjoreia. " , Hardangerfj.	592	592	592	26.0	9.7	26.0	9.7	2.27	3.0	0.5	150	84	0.6	3.0	0.63	0.30	0.48			
	Sima, Eidfj, Hardangerfj.	145	145	128	69.2	83.0	69.2	83.0	2.56	3.0	0.5	150	134	0.5	1.0	0.20	0.30	0.46			
	Austdøla, Osafj, Eidfj.	131	130	89	74.6	89.5	74.6	89.5	2.00	8.0	3.0	180	150	1.0	5.0	<0.01	0.30	0.50			
	Norddøla, Osafj, Etdfj.	40	39	89	74.6	89.5	74.6	89.5	3.90	8.0	3.0	230	210	1.0	5.0	<0.01	0.30	0.50			
	Tysseelva, Fusafj.	240	240	50	85.0	98.6	85.0	98.6	1.44	4.0	0.5	144	79	0.8	2.5	<0.01	0.40	0.56			
	Oselva, Fusafj.	109	108	50	91.7	111.4	91.7	111.4	3.80	10.0	7.0	340	150	1.0	10.0	<0.01	0.30	1.00			
	Bergdalse, Veafj, Herdlafj	198	198	1102	80.0	86.4	80.0	86.4	1.52	4.0	0.5	138	78	1.0	3.2	0.06	0.30	0.62			
	Vosso, Veafj, Sørfj.	1492	1465	342	58.2	64.0	58.2	64.0	1.48	5.0	0.5	248	143	0.8	4.0	0.03	0.30	0.78			
	Ekso, Osterfj.	414	400	342	86.2	86.2	86.2	86.2	0.99	4.0	2.0	131	35	1.0	8.0	<0.01	<0.10	0.70			
	Modalselva, Osterfj.	385	384	248	95.5	95.5	95.5	95.5	0.80	3.0	1.0	105	70	1.0	5.0	<0.01	<0.10	0.50			

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1991.

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	Sampl. station kv.km	Disch. gaug. station kv.km	Normal 1/s kv.km	1991 Normal 1/s kv.km	Normal 1/s kv.km	1991 Normal 1/s kv.km													
Sogn og Fjordane (7.)	Nærøye.. Aurl.fj. Sognefj.	290	290	267	59.5	65.5	59.5	1.71	3.0	0.5	173	143	0.6	9.0	0.06	0.40	0.22				
	Flåmse.. Aurl.fj. Sognefj.	280	275	275	52.4	47.2	52.4	4.24	2.0	0.5	236	205	0.5	1.0	0.04	<0.10	0.41				
	Aurlandv.Aurl.fj. Sognefj.	800	799	762	48.6	54.9	48.6	1.59	3.0	0.5	207	170	0.5	1.0	<0.01	<0.10	0.59				
	Erdalse. Lærd.fj. Sognefj.	138	138	1172	30.0	29.1	30.0	1.48	3.0	0.5	167	123	0.7	2.0	0.04	0.40	0.44				
	Lærdalsv.Lærd.fj. Sognefj.	1184	1172	1172	30.0	18.2	30.0	2.57	6.0	0.5	197	155	0.9	1.4	0.04	0.40	0.61				
	Årdalsv. Årdalsfj. Sognefj.	989	989	989	44.9	38.0	44.9	1.18	4.3	1.3	177	71	4.3	5.0	<0.01	0.50	2.00				
	Fortunv. Lusterfj. Sognefj.	508	508	367	51.0	58.6	51.0	1.25	4.0	1.0	144	114	1.4	1.0	<0.01	0.40	1.29				
	Mørkrisv.Lusterfj. Sognefj.	282	282	203	54.7	47.6	54.7	1.43	2.0	0.5	191	150	0.5	1.0	0.03	<0.10	0.38				
	Jostedal.. " Sognefj.	865	864	573	68.0	60.9	68.0	2.18	3.0	0.5	207	175	0.5	1.0	<0.01	<0.10	0.97				
	Årøye.. Sognd.fj. Sognefj.	449	446	384	77.2	82.6	77.2	1.57	4.0	0.5	144	85	0.5	1.0	0.02	<0.10	0.66				
	Sogndalse.. " Sognefj.	175	172	111	66.1	71.4	66.1	1.49	6.0	0.5	185	103	0.5	4.0	<0.01	0.40	1.07				
	Gaular. Dalsfj. Bufj.	627	625	505	79.3	84.4	79.3	1.27	6.0	0.5	185	115	0.5	1.4	0.03	0.40	0.49				
	Jøstra. Førdefj.	714	709	384	74.3	81.1	74.3	1.57	5.0	0.5	185	119	0.5	2.9	<0.01	0.40	0.55				
	Nausta. Førdefj.	277	273	232	81.7	81.5	81.7	1.68	6.0	1.0	185	114	0.5	2.0	<0.01	0.30	0.82				
	Oselva. Høydalsfj.	287	285	225	78.7	90.5	78.7	1.94	6.0	1.0	138	51	0.5	5.3	0.04	0.40	0.79				
	Hopse.. Høyfj. Nordfj.S	73	73	161	75.0	86.3	75.0	2.41	3.0	1.0	132	98	0.5	1.5	0.03	<0.10	0.61				
	Gjengedalse.. " Nordfj.S	170	168	161	75.0	75.7	75.0	1.33	4.0	1.0	132	70	0.5	2.6	0.03	0.30	0.48				
	Breimse.. Gloppenfj. "	636	634	585	68.0	74.8	68.8	1.77	5.0	1.0	242	195	0.8	1.4	<0.01	1.10	0.76				
	Oldene.. Indre Nordfj.	226	225	214	70.1	63.9	70.1	1.62	4.0	1.0	207	175	0.9	1.6	0.03	0.40	1.03				
	Loenelva. Indre Nordfj.	261	260	234	65.0	62.9	65.0	1.89	15.0	12.0	162	126	1.5	2.2	0.03	0.40	0.66				
	Strynee.. Indre Nordfj.	532	530	493	60.2	54.7	60.2	1.85	4.0	1.0	185	133	1.3	1.0	<0.01	0.10	0.81				
	Hornindalse.. Nordfj. N	428	424	378	58.1	57.8	58.1	2.13	4.0	1.0	272	205	0.6	2.2	0.03	0.20	0.64				

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1991.

County	Watercourse	Runoff data										Parameters (mean values)						
		Drainage area		Discharge				Cond				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 1991 l/s kv.km	Normal 1991 l/s kv.km	gauging station 1991 l/s kv.km	Normal 1991 mS/m	Normal 1991 mS/m	Normal 1991 mS/m	Normal 1991 mS/m							
Møre og Romsdal (8.)	Ørstaec.. Ørstafj.	160	155		70.0	84.0	70.0	8.0	3.31	282	195	0.5	2.0	0.04	0.60	0.75		
	Valldøla, Nordalfj., Storfj.	359	357		60.0	60.6	60.0	4.0	2.40	254	195	1.0	1.6	<0.01	0.40	0.50		
	Rauma, Romsdalsfj., Moldefj.	1202	1190	1142	32.8	23.9	32.8	3.0	2.06	122	82	5.1	2.6	0.04	0.40	0.71		
	Isa. Isfj. Moldefj.	175	175	89	57.0	55.3	57.0	5.0	2.82	242	160	1.6	3.2	0.06	0.40	1.65		
	Eira. Eresfj. Moldefj.	1119	1119	1085	34.8	39.0	34.8	3.0	2.65	236	185	0.6	1.9	0.11	2.40	0.87		
	Litledalse., Sunndalsfj.	359	330	330	41.0	45.1	41.0	4.0	1.08	81	15	5.2	1.6	0.03	1.50	0.47		
	Driva, Sunndfj., Tingvollfj.	2487	2435	2435	27.9	30.4	27.9	1.0	3.12	197	133	1.1	2.0	0.62	0.30	1.18		
	Ulvåa. Ålvundfj.	199	199	207	62.1	60.7	62.1	7.0	2.41	225	127	3.4	3.6	0.05	0.40	1.21		
	Toåa. Todalsfj.	251	251	207	58.5	41.9	58.5	4.0	2.07	110	34	1.5	1.6	0.04	0.60	0.65		
	Surna. Surnadalsfj.	1200	1200	1125	48.0	55.2	49.3	5.0	2.87	242	149	1.0	5.3	0.06	0.20	1.63		
	Bøvra. Hammesfj., Halsafj.	243	243	196	55.0	63.3	55.0	5.0	5.77	179	67	1.4	1.6	<0.01	0.30	0.91		
	Sør- Trøndelag (8.)	Børse., Gaulosen Tr.h.fj.	110	100		30.0	32.4	30.0	14.0	10.75	918	630	2.8	2.6	0.05	0.20	3.01	
		Vigda. Gaulosen Tr.h.fj.	150	150		30.0	32.4	30.0	10.0	12.48	453	260	1.6	3.8	0.05	0.60	9.89	
Gaula. Gaulosen Tr.h.fj.		3659	3650	3062	26.4	29.0	26.4	5.0	3.95	218	75	2.3	4.3	0.05	0.80	3.39		
Nidelva. Trondheimsfj.		3110	3100	3049	35.5	32.5	35.5	7.0	3.67	200	81	1.4	2.1	0.05	0.20	2.03		
Homla. Stjørd.fj., Tr.h.fj.		157	157		30.0	30.0	30.0	27.0	6.08	318	53	1.7	2.9	0.05	0.20	2.34		
Nord- Trøndelag (8.)	Stjørdalsv. " Tr.h.fj.	2117	2117	1863	38.5	28.4	38.5	10.0	3.71	300	188	1.9	3.7	0.02	1.20	12.70		
	Gråe.. " Tr.h.fj.	93	93		25.0	25.0	25.0	10.0	4.00	300	150	1.0	5.0	0.02	0.40	2.00		
	Verdalsvassdr., Tr.h.fj.	1472	1472	898	40.0	31.6	44.5	6.0	4.35	258	143	1.1	1.0	0.02	0.30	1.54		
	Figga/Leksdalse., Tr.h.fj.	282	282	178	30.0	28.8	33.6	13.0	5.55	531	200	1.5	2.5	0.02	0.70	5.93		
	Snåsavassdr., Trondh.fj.	2153	2125	2125	35.1	26.5	35.1	10.0	4.81	300	124	1.0	1.3	0.02	0.20	1.31		
	Årgårdselva. Namsfj.	543	510	238	43.0	39.3	50.9	14.9	4.47	361	10	0.9	3.8	0.02	0.30	0.44		
	Namsen. Namsfj. Ø	6277	6276	5718	44.0	46.2	43.4	4.0	2.01	117	33	1.2	3.5	0.02	0.40	0.99		
Salsvatnelva. Follafj.	432	432	422	59.7	65.7	59.7	3.0	4.95	129	66	1.1	2.0	0.02	0.80	0.26			

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1991.

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 kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1991 l/s kv.km	Normal l/s kv.km	1991 l/s kv.km													
Nordland (9.)	Åbjøra. Bindalsfj. S	526	520	384	80.2	52.9	80.2	52.9	2.03	4.0	1.0	59	12	1.0	1.0	0.02	0.30	0.43			
	Skjerva. Vefsenfj. S	104	104	98	41.3	49.6	41.3	41.3	5.00	10.0	1.0	350	100	1.0	5.0	0.02	0.40	2.00			
	Fusta. Vefsenfj. N	544	543	520	63.4	76.1	63.4	63.4	2.43	5.0	0.7	77	20	0.7	1.0	0.02	0.30	1.03			
	Drevja. Vefsenfj. N	177	176	98	65.0	78.0	65.0	65.0	4.49	5.0	0.3	101	43	0.3	1.2	0.02	0.30	2.21			
	Røssåga. Sørfj.	2092	2087	1880	45.4	54.9	45.4	45.4	3.91	4.0	1.1	95	47	1.1	2.1	0.04	0.40	0.55			
	Bjerka. Sørfj.	385	385	273	55.4	60.9	55.4	55.4	3.03	4.0	1.0	47	10	1.0	1.0	0.02	0.40	1.45			
	Dalselva. Ranafj. N	211	211	129	39.5	43.5	39.5	39.5	2.23	4.0	0.8	53	17	0.8	1.0	0.02	0.80	0.82			
	Ranavassdraget. Ranafj. N	3847	3846	1892	51.3	61.6	44.9	44.9	2.21	4.0	0.5	65	37	0.5	1.1	0.04	0.40	2.41			
	Fykanåga. Glomfjord	297	297	243	103.7	119.3	103.7	103.7	2.99	3.0	1.0	84	42	1.0	1.0	0.02	0.40	1.70			
	Beiare..Beiarfj. Nordfj.	1064	875	797	45.1	51.4	45.1	45.1	2.13	4.0	1.5	59	31	1.5	4.8	0.02	0.90	11.00			
	Saldalsvassdr..Sald.fj.S	1544	1543	1168	32.1	38.5	32.1	32.1	1.62	4.0	0.8	59	36	0.8	1.3	0.02	0.60	5.19			
	Sulitjelmvassdr..Sald.fj	1028	800	791	44.0	46.2	44.0	44.0	39.86	4.0	1.0	101	53	18.9	30.0	0.05	0.70	1.02			
	Kobbe. Leirfj. Sørfolda N	405	405	386	66.9	78.3	66.9	66.9	1.92	4.0	0.8	65	38	0.8	2.3	0.02	0.20	0.72			
	Skjoma. Ofotfj. S	845	840	797	36.3	41.7	36.3	36.3	1.41	4.0	0.7	53	16	0.7	1.1	0.02	0.20	1.06			

Table 8.1 TRIBUTARY RIVERS. MEAN CONCENTRATIONS 1991.

County	Watercourse	Runoff data						Parameters (mean values)										S.P.M. mg/l	
		Drainage area		Discharge		gauging station	1991 Normal l/s kv.km	1991 Normal l/s kv.km	1991 Normal l/s kv.km	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
		Outlet station kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km														
Troms (9.)	Spanselva. Astafj. Vågsfj.	142	142	533	50.0	55.0	50.0	5.93	4.0	1.0	83	21	0.9	0.8	0.02	0.60	2.61		
	Salangse.. Astafj. Vågsfj.	539	539	533	40.9	47.0	40.9	7.15	4.0	1.0	69	34	0.6	0.6	0.02	0.50	3.84		
	Rosfjorde.. Malangen	196	190		39.5	41.1	39.5	7.72	6.0	1.0	116	18	1.2	2.0	0.02	0.50	1.10		
	Målse.. Målselfj.	3239	3200	3118	28.7	27.9	28.7	5.40	4.0	2.0	100	40	1.5	1.6	0.02	0.40	5.60		
	Bardue.. Måselva	2906	2906	2049	28.3	27.9	28.3	5.52	4.0	2.0	99	36	1.5	1.6	0.02	0.40	5.59		
	Nordkjøselva. Balsfj.	191	191	415	27.7	30.5	27.7	3.28	4.0	2.0	45	18	1.1	0.8	0.02	0.40	5.30		
	Signaldalselva. Lyngen V	473	467	415	27.7	34.6	27.7	2.81	4.0	1.0	63	29	1.6	5.6	0.02	0.70	8.42		
	Skibotnelva. Lyngen	770	770	724	18.0	28.2	18.0	2.75	4.0	1.0	81	32	1.0	1.8	0.02	0.40	1.65		
	Kålfjordelva. Lyngen Ø	358	358	348	20.0	35.1	20.0	2.94	4.0	1.0	104	56	1.9	1.5	0.02	0.40	0.78		
	Reisa. Reisa fj.	2702	2702		16.0	20.0	16.0	3.01	4.0	1.0	87	31	1.4	1.5	0.02	0.40	1.48		
	Finmark (10.)	Mattselva. Kåfj. Altafj.	325	325	319	26.5	33.1	26.5	2.44	5.0	1.0	81	19	0.6	3.0	0.02	0.90	0.74	
		Tverrelva. Altafj.	234	233	233	15.1	20.6	15.1	3.89	6.0	1.0	158	33	0.8	2.9	0.02	0.30	1.49	
		Repparfjordv.. Repparfj.	1090	1089		25.0	35.0	25.0	3.24	4.0	1.0	87	19	0.5	1.0	0.01	0.10	0.58	
		Stabburse..I. Porsangen V	1108	1102	870	18.3	22.0	18.3	2.56	4.0	1.0	87	15	5.0	1.1	0.01	1.40	0.66	
Lakse.. Indre Porsangen S		1533	1532	941	15.9	19.4	15.9	4.05	5.0	1.0	116	14	1.3	2.0	0.01	0.40	3.07		
Børselva.Indre Porsangen Ø		883	883	863	29.8	35.2	29.8	3.32	3.0	1.0	45	11	0.5	6.8	<0.01	0.80	0.70		
Mattusjåkkå. I. Laksefj. V		101	101	101	22.8	27.4	22.8	4.00	5.0	1.0	100	15	0.5	2.0	0.02	0.40	1.00		
Storelva.Indre Laksefj. V		690	690	760	21.9	27.4	19.9	1.85	3.0	0.5	93	73	0.5	4.0	0.02	0.40	0.45		
Soussjåkkå. I. Laksefj. V		92	92	102	25.3	31.6	22.8	4.22	3.0	1.0	69	27	0.5	3.2	0.02	0.40	0.45		
Adamselva. I. Laksefj. Ø		705	705	760	19.9	24.9	19.9	5.84	4.0	1.0	81	16	0.7	5.0	0.02	0.40	0.43		
Tanavassdraget. Tanafj. S	16389	15713	14169	11.5	13.8	11.5	3.76	6.0	1.0	162	10	1.0	1.6	0.04	1.05	1.19			
Vesterelva. Syltefj.	469	469	79	34.6	34.6	34.6	8.76	4.0	1.0	51	10	0.5	0.5	<0.01	0.40	0.57			
V. Jakobse.. Y. Varangerfj.	627	627	239	18.1	18.3	18.1	4.84	5.0	1.0	81	10	0.8	4.0	<0.01	0.40	1.11			
Passvike..Bøkfj. Varang.fj.	18404	18400	18175	9.3	10.2	9.3	4.49	7.0	1.1	152	27	3.5	6.8	0.02	0.40	1.11			
Neiden. Munkfj. Varang.fj.	2960	2960	2911	9.8	12.9	9.8	2.99	6.0	1.0	180	30	1.0	26.0	0.02	0.40	1.33			
Grense Jakobse..Varang.fj.	234	234		18.0	18.2	18.0	5.04	5.0	1.1	100	14	2.2	1.3	0.02	0.30	0.90			

Table 8.2

APPENDIX IX : TRIBUTARY RIVERS. ANNUAL LOAD 1991

Page:

Table 9.1 Cond., Nutrients, Heavy metals, Suspended part.matter 78-84

Table 9.2 Mercury, Lindane, PCBs *(Detection limit = limit) 86-92

- | | | | | | |
|------|-----------------------------|---|-------------|---|-----------------|
| (1) | Glomma "tributaries" | : | Tista | - | Hølenelva |
| (1) | Inner Oslo-fjord | : | Årungenelva | - | Åroselva |
| (2) | Drammenselva "tributary" | : | Lierelva | | |
| (3) | Numedalslågen "tributaries" | : | Sandeelva | - | Farriselva |
| (4) | Skienelva "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 as well as in Tables 5.1-5.4 both "zero- and limit-values" are shown.

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1991.

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	1991 1/s kv.km	1991 1/s kv.km	Cond mS/m	Tot-P tons	PO4-P tons	Tot-N tons	NO3-N tons	Cu tons	Zn tons	C d zero tons	limit tons	P b zero tons	limit tons			
Østfold (1.)	Tista, Iddefj.	1588	1582	1582	14.4	12.4	14.4	14.4	12.4	12.4	6.01	11.5	1.4	593	431	1.08	3.66	0.10	0.29	0.29	0.10	
	Mosselva, Mossesundet	690	689	689	14.5	14.3	14.5	14.5	14.3	14.3	9.56	7.9	1.3	333	63	0.41	1.51	0.02	0.09	0.09	0.02	
	Oslo & Akershus (1.)	Hølenelva, Drøbakundet	137	121		14.0	12.9					28.50	4.5	3.0	316	272	0.23	0.29	0.00	0.02	0.02	0.00
		Årungenelva, I. Oslofj.	52	50		13.0	12.8					21.30	0.9	0.2	53	14	0.03	0.03	0.00	0.01	0.01	0.00
		Gjersjøelva, I. Oslofj.	86	85	85	14.0	7.4		7.4			15.90	0.6	0.1	59	37	0.07	0.17	0.01	0.01	0.01	0.01
		Ljanselva, I. Oslofj.	42	41	41	13.0	10.1		10.1			20.80	0.9	0.3	25	11	0.17	0.42	0.00	0.03	0.03	0.00
		Loelva/Alna, I. Oslofj.	75	69	69	13.0	17.5		17.5			28.20	5.2	1.5	63	20	0.57	0.85	0.01	0.51	0.51	0.01
		Akerselva, I. Oslofj.	227	225	225	17.5	9.2		9.2			8.00	3.5	0.4	85	41	2.48	6.21	0.02	0.47	0.47	0.02
		Frognerelva, I. Oslofj.	23	20	20	15.0	29.6		29.6			17.80	0.7	0.4	13	4	0.19	0.57	0.00	0.02	0.02	0.00
		Lysakerelva, I. Oslofj.	178	173	173	16.8	18.0		16.8		16.8	9.80	1.8	0.3	61	25	0.92	0.92	0.00	0.05	0.05	0.00
Buskerud (2.)	Sandvikselva, I. Oslofj.	223	187	187	18.4	13.4		18.4		13.4	14.26	2.1	1.1	126	105	0.49	1.41	0.02	0.33	0.33	0.02	
	Åroselva, I. Oslofj.	113	109	109	17.0	16.3		17.0		17.0	5.55	3.3	0.9	99	34	0.29	0.58	0.01	0.03	0.03	0.01	
Vestfold (3.)	Lierelva, Drammensfj. Ø	309	266	222	18.6	20.7		18.6		20.7	13.80	11.5	7.8	197	140	0.31	1.89	0.00	0.04	0.04	0.00	
	Sandeeelva, Sandebukta	193	190		17.0	15.3		17.0			50.00	1.9	0.8	207	173	0.18	0.92	0.02	0.10	0.10	0.02	
	Aulielva, Tønsbergfj.	363	362	362	14.9	12.7		14.9			24.10	9.8	3.4	392	284	0.24	1.19	0.01	0.09	0.09	0.01	
Telemark (4.)	Farriselva, Larvikfj.	491	491	491	21.6	23.0		21.6		23.0	3.96	2.9	0.9	203	147	0.50	1.67	0.00	0.17	0.17	0.00	
	Tokkeelva, Kragerø	1238	1200	1200	26.7	19.4		26.7		19.4	3.21	4.0	1.0	432	273	1.72	17.38	0.10	0.25	0.25	0.10	
Aust-Agder (5.)	Gjerstadelva, Søndeledfj.	419	414	291	27.0	21.9		27.0		21.9	3.16	1.8	0.4	142	71	0.56	3.45	0.05	0.11	0.11	0.05	
	Vegårdselva, Sandnesfj.	457	429	291	29.3	23.4		29.3		23.4	3.93	3.6	0.8	191	95	0.24	11.89	0.00	0.12	0.12	0.00	
	Nidelva, Arendal	4025	4020	3956	29.8	25.7		29.8		25.7	2.85	18.9	1.9	1485	963	2.27	47.22	0.45	3.02	3.02	0.45	

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1991.

County	Watercourse	Runoff data						Parameters (mean values)											
		Drainage area		Discharge		gauging station	1991	Cond	Tot-P	PO4-P	Tot-N	NO3-N	Cu	Zn	C d		P b		
		Outlet station	Disch. gaug. station	Normal	1991										Normal	1991	zero tons	limit tons	zero tons
kv.km	kv.km	kv.km	kv.km	l/s kv.km	l/s kv.km	mS/m	tons	tons	tons	tons	tons	tons	tons	tons	tons	tons	tons		
Vest-Agder (5.)	Tovdalselva, Topdalsfj.	1856	1794	33.9	28.4	33.9	28.4	2.64	11.9	1.0	664	283	0.99	32.11	0.04	0.04	1.19	1.19	
	Søgneelva, Flekkerøy	204	192	38.0	34.4	38.0	34.4	5.41	2.1	0.7	137	99	0.30	4.60	0.02	0.02	0.16	0.16	
	Mandalselva, Mannefj.	1809	1740	46.0	39.7	47.6	43.1	2.88	26.1	1.3	859	392	4.18	27.16	0.55	0.55	1.83	1.83	
	Audna, Sniksfj.	450	400	45.0	49.5	51.8	64.3	4.64	4.0	0.6	190	108	0.28	5.05	0.07	0.07	0.23	0.23	
	Lygna, Lyngdalsfj.	664	660	48.0	50.4	57.9	64.3	3.75	7.0	0.5	335	190	0.50	8.89	0.00	0.01	0.60	0.60	
	Kvina, Fedafj.	1445	1140	57.6	16.0	57.6	16.0	3.53	16.6	4.1	621	259	3.73	18.43	0.06	0.06	1.66	1.66	
	Sira, Åna-Sira	1916	1872	59.4	92.1	59.4	92.1	2.39	14.0	1.8	1010	719	9.12	22.79	0.00	0.04	2.45	2.45	
	Rogaland (6.)	Sokndalselva, Sogndalsstr.	294	293	51.1	53.0	51.1	53.0	4.54	2.8	0.2	180	135	0.85	3.59	0.05	0.05	0.19	0.19
		Hellelandselva, Egersund	241	240	57.5	61.3	71.1	80.4	3.56	3.9	0.9	189	146	0.22	3.35	0.00	0.00	0.17	0.17
		Bjerkreimselva, Egersund	705	704	77.7	68.8	86.4	78.9	3.27	8.6	1.7	688	578	2.24	13.11	0.03	0.03	0.69	0.69
		Håelva, Håtangen	165	160	46.9	52.1	46.9	52.1	7.73	10.2	7.3	298	232	0.40	3.29	0.06	0.06	0.19	0.19
		Figgjo, Solavika	229	218	50.0	58.3	50.0	58.3	7.66	11.3	7.9	443	351	0.48	5.64	0.01	0.01	0.41	0.41
		Ims-Lutsi, Høgsfj., Boknafj.	127	127	34.9	38.7	34.9	38.7	7.00	1.4	0.4	105	81	0.25	0.28	0.00	0.00	0.07	0.07
		Oltedalse., Høgsfj., Boknafj.	102	101	70.0	76.3	70.0	76.3	5.00	12.0	1.8	125	58	0.40	0.89	0.00	0.00	0.22	0.22
Dirdalse., Høgsfj., Boknafj.		158	158	83.0	89.6	83.0	89.6	2.40	1.2	0.4	128	74	1.53	3.35	0.01	0.01	0.62	0.62	
Fraforde., Frajf., Boknafj.		178	178	94.4	101.9	94.4	101.9	2.50	2.1	0.5	164	106	0.53	2.12	0.01	0.01	0.16	0.16	
Espedalse., Høgsfj., Boknafj.		138	138	90.0	98.1	90.0	98.1	2.50	1.6	0.4	121	78	0.39	1.57	0.01	0.01	0.12	0.12	
Lysee., Lysefj., Boknafj.		182	182	74.0	85.1	74.0	85.1	2.50	1.7	0.4	132	85	0.42	1.70	0.01	0.01	0.13	0.13	
Årdalse., Årdalsfj., Boknafj.		519	516	81.4	32.8	81.4	32.8	2.56	5.3	0.7	472	411	0.79	5.17	0.03	0.03	0.40	0.40	
Førree., Jøsenfj., Boknafj.		163	163	85.8	103.0	85.8	103.0	2.50	1.8	0.2	132	110	0.44	1.76	0.01	0.01	0.13	0.13	
Ulla, Jøsenfj., Boknafj.		393	393	83.4	100.0	83.4	100.0	2.50	4.1	0.5	310	258	1.03	4.13	0.02	0.02	0.31	0.31	
Saudae., Saudafj., Boknafj.	353	353	85.0	98.6	85.0	98.6	2.10	2.8	0.9	265	208	0.95	2.84	0.02	0.02	0.28	0.28		
Åbølva, Saudafj., Boknafj.	82	82	85.0	98.6	85.0	98.6	2.10	0.7	0.2	62	48	0.22	0.66	0.00	0.00	0.07	0.07		
Vikedalse., Boknafj.	118	117	80.0	91.2	80.0	91.2	2.97	2.4	0.1	94	72	0.21	1.30	0.01	0.01	0.09	0.09		

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1991.

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	C d		P b		
		Outlet kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1991 l/s kv.km	Normal l/s kv.km	1991 l/s kv.km	zero tons								limit tons	zero tons	limit tons		
Sogn og Fjordane (7.)	Nærøye.. Aurl.fj. Sognefj.	290	290	267	59.5	65.5	59.5	59.5	1.71	1.6	0.3	94	78	0.33	4.90	0.03	0.03	0.22	0.22		
	Flåmse.. Aurl.fj. Sognefj.	280	275	275	52.4	47.2	52.4	52.4	4.24	0.9	0.2	107	93	0.23	0.45	0.02	0.02	0.00	0.05		
	Aurlandv.Aurl.fj. Sognefj.	800	799	762	48.6	54.9	48.6	48.6	1.59	3.7	0.6	253	208	0.61	1.22	0.00	0.01	0.00	0.12		
	Erdalse. Lærd.fj. Sognefj.	138	138		30.0	29.1	30.0	30.0	1.48	0.4	0.1	22	16	0.09	0.26	0.01	0.01	0.05	0.05		
	Lærdalsv.Lærd.fj. Sognefj.	1184	1172	1172	30.0	18.2	30.0	30.0	2.57	6.7	0.6	218	172	1.00	1.55	0.04	0.04	0.44	0.44		
	Årdalsv. Årdalsfj. Sognefj.	989	989	989	44.9	38.0	44.9	44.9	1.18	6.0	1.8	248	99	6.02	7.00	0.00	0.01	0.70	0.70		
	Fortunv. Lusterfj. Sognefj.	508	508	367	51.0	58.6	51.0	51.0	1.25	3.3	0.8	118	93	1.14	0.82	0.00	0.01	0.33	0.33		
	Mørkrivs.Lusterfj. Sognefj.	282	282	203	54.7	47.6	54.7	47.6	1.43	1.0	0.2	93	73	0.24	0.49	0.01	0.01	0.00	0.05		
	Jostedøla. " Sognefj.	865	864	573	68.0	60.9	68.0	68.0	2.18	5.6	0.9	384	324	0.93	1.85	0.00	0.02	0.00	0.19		
	Årøye.. Sognd.fj. Sognefj.	449	446	384	77.2	82.6	77.2	77.2	1.57	4.3	0.5	156	92	0.54	1.09	0.02	0.02	0.00	0.11		
	Sogndalse. " Sognefj.	175	172	111	66.1	71.4	66.1	66.1	1.49	2.2	0.2	66	37	0.18	1.43	0.00	0.00	0.14	0.14		
	Gaular. Dalsfj. Bufj.	627	625	505	79.3	84.4	79.3	79.3	1.27	9.4	0.8	289	180	0.78	2.19	0.05	0.05	0.63	0.63		
	Jølstra. Førdefj.	714	709	384	74.3	81.1	74.3	74.3	1.57	8.3	0.8	307	198	0.83	4.82	0.00	0.02	0.66	0.66		
	Nausta. Førdefj.	277	273	232	81.7	81.5	81.7	81.5	1.68	4.2	0.7	130	80	0.35	1.41	0.00	0.01	0.21	0.21		
	Oselva. Høydalsfj.	287	285	225	78.7	90.5	78.7	78.7	1.94	4.2	0.7	98	36	0.35	3.75	0.03	0.03	0.28	0.28		
	Hopse.. Hyefj. Nordfj.S	73	73	161	86.3	75.0	86.3	75.0	2.41	0.5	0.2	23	17	0.09	0.26	0.01	0.01	0.00	0.02		
	Gjengedalse.. Nordfj.S	170	168	161	75.0	75.7	75.0	75.0	1.33	1.6	0.4	52	28	0.20	1.03	0.01	0.01	0.12	0.12		
	Brcimse.. Gløppenfj. "	636	634	585	68.0	74.8	68.8	68.8	1.77	6.8	1.4	329	265	1.09	1.90	0.00	0.01	1.50	1.50		
	Oldene.. Indre Nordfj.	226	225	214	70.1	63.9	70.1	70.1	1.62	2.0	0.5	103	87	0.45	0.80	0.01	0.01	0.20	0.20		
	Loenelva. Indre Nordfj.	261	260	234	65.0	62.9	65.0	62.9	1.89	8.0	6.4	86	67	0.80	1.17	0.02	0.02	0.21	0.21		
Strynee.. Indre Nordfj.	532	530	493	60.2	54.7	60.2	54.7	1.85	4.0	1.0	186	134	1.31	1.01	0.00	0.01	0.10	0.10			
Hornindalse.. Nordfj. N	428	424	378	58.1	57.8	58.1	58.1	2.13	3.1	0.8	211	159	0.47	1.71	0.02	0.02	0.16	0.16			

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1991.

County	Watercourse	Runoff data														
		Drainage area		Discharge		Parameters (mean values)										
		Outlet kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Sampling station Normal 1/s kv.km	gauging station 1991 l/s kv.km	Cond mS/m	Tot-P tons	PO4-P tons	Tot-N tons	NO3-N tons	Cu tons	Zn tons	C d zero tons	limit tons	P b zero tons
Møre og Romsdal (8.)	Ørstae., Ørstafj.	160	155		70.0	70.0	3.31	2.7	0.3	96	67	0.17	0.68	0.01	0.21	0.21
	Valldøla, Nordalfj. Storfj.	359	357		60.0	60.0	2.40	2.7	0.3	172	132	0.68	1.08	0.00	0.27	0.27
	Rauma, Romsdalsfj. Molde	1202	1190	1142	32.8	32.8	2.06	3.7	0.6	150	101	6.28	3.20	0.05	0.49	0.49
	Isa, Isfj. Moldefj.	175	175	89	57.0	57.0	2.82	1.6	0.6	76	50	0.50	1.01	0.02	0.13	0.13
	Eira, Eresfj. Moldefj.	1119	1119	1085	34.8	34.8	2.65	3.7	0.6	290	227	0.74	2.33	0.14	2.95	2.95
	Litledalse., Sunndalsfj.	359	330	330	41.0	41.0	1.08	1.7	0.4	35	6	2.22	0.68	0.01	0.64	0.64
	Driva, Sunnd. fj. Tingvollfj.	2487	2435	2435	27.9	27.9	3.12	10.7	2.1	422	285	2.36	4.28	1.33	0.64	0.64
	Ulvåa, Ålvundfj.	199	199	207	62.1	60.7	2.41	2.5	0.7	80	45	1.22	1.29	0.02	0.14	0.14
	Toåa, Todalsfj.	251	251	207	58.5	58.5	2.07	1.9	0.2	51	16	0.69	0.74	0.02	0.28	0.28
	Surna, Surnadalsfj.	1200	1200	1125	48.0	49.3	2.87	9.1	0.9	440	271	1.82	9.63	0.11	0.36	0.36
Bøvra, Hammesfj. Halsafj.	243	243	196	55.0	55.0	5.77	2.1	0.4	75	28	0.59	0.67	0.00	0.13	0.13	
Sør- Trøndelag (8.)	Børsc., Gaulosen Tr.h.fj.	110	100		30.0	30.0	10.75	1.3	0.3	87	60	0.26	0.25	0.00	0.02	0.02
	Vigda, Gaulosen Tr.h.fj.	150	150		30.0	30.0	12.48	1.4	0.4	64	37	0.23	0.54	0.01	0.09	0.09
	Gaula, Gaulosen Tr.h.fj.	3659	3650	3062	26.4	26.4	3.95	15.2	3.0	662	228	6.99	13.07	0.15	2.43	2.43
	Nidelva, Trondheimsfj.	3110	3100	3049	35.5	35.5	3.67	24.3	6.9	694	281	4.86	7.29	0.17	0.69	0.69
	Homla, Stjørd.fj. Tr.h.fj.	157	157		30.0	30.0	6.08	4.0	0.4	47	8	0.25	0.43	0.01	0.03	0.03
	Stjørdalsv. " Tr.h.fj.	2117	2117	1863	38.5	38.5	3.71	25.7	12.9	771	483	4.88	9.51	0.05	3.08	3.08
Nord- Trøndelag (8.)	Græ., " Tr.h.fj.	93	93		25.0	25.0	4.00	0.7	0.2	22	11	0.07	0.37	0.00	0.03	0.03
	Verdalsvassdr., Tr.h.fj.	1472	1472	898	40.0	44.5	4.35	11.1	3.7	479	266	2.04	1.86	0.04	0.56	0.56
	Figga/Leksdalse., Tr.h.fj.	282	282	178	30.0	28.8	5.55	3.5	1.1	142	53	0.40	0.67	0.01	0.19	0.19
	Snåsavassdr., Trondh.fj.	2153	2125	2125	35.1	26.5	4.81	23.5	4.7	706	292	2.35	3.06	0.05	0.47	0.47
	Årgårdselva, Namsfj.	543	510	238	43.0	50.9	4.47	10.3	0.7	250	7	0.62	2.63	0.01	0.21	0.21
	Namsen, Namsfj. Ø	6277	6276	5718	44.0	43.4	2.01	34.8	8.7	1019	287	10.45	30.48	0.17	3.48	3.48
Salsvatnelva, Follafj.	432	432	422	59.7	59.7	4.95	2.4	0.8	105	54	0.89	1.63	0.02	0.65	0.65	

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1991.

County	Watercourse	Runoff data										Parameters (mean values)									
		Drainage area		Discharge				Conductivity				NO ₃ -N	Cu	Zn	C d		P b				
		Outlet	Disch.	Normal	1991	Normal	1991	Normal	1991	Cond	Tot-P				PO ₄ -P	Tot-N	zero	limit	zero	limit	
kv.km	station	station	station	station	station	station	station	station	station	station	station	station	station	station	station	station	station				
Nordland (9.)	Åbjøra. Bindalsfj. S	526	520	384	80.2	52.9	80.2	52.9	80.2	52.9	5.3	1.3	78	16	1.32	0.03	0.03	0.39			
	Skjerva. Vefsenfj. S	104	104	98	41.3	49.6	41.3	41.3	41.3	1.4	0.4	47	14	0.68	0.00	0.00	0.05				
	Fusta. Vefsenfj. N	544	543	520	63.4	76.1	63.4	63.4	63.4	5.4	1.1	84	22	1.09	0.02	0.02	0.33				
	Drevja. Vefsenfj. N	177	176	98	65.0	78.0	65.0	65.0	65.0	1.8	1.1	36	16	0.43	0.01	0.01	0.11				
	Røssåga. Sørfj.	2092	2087	1880	45.4	54.9	45.4	45.4	45.4	3.91	3.0	284	140	6.27	0.12	0.12	1.20				
	Bjerka. Sørfj.	385	385	273	55.4	60.9	55.4	55.4	55.4	2.7	0.7	32	7	0.67	0.01	0.01	0.27				
	Dalselva. Ranafj. N	211	211	129	39.5	43.5	39.5	39.5	39.5	1.1	0.3	14	4	0.26	0.01	0.01	0.21				
	Ranavassdraget. Ranafj. N	3847	3846	1892	51.3	61.6	44.9	44.9	44.9	2.21	6.2	404	230	6.84	0.25	0.25	2.49				
	Fykanåga. Glomfjord	297	297	243	103.7	119.3	103.7	103.7	103.7	2.99	1.9	82	41	0.97	0.02	0.02	0.39				
	Beiare..Beiarfj. Nordfj.	1064	875	797	45.1	51.4	45.1	45.1	45.1	2.13	5.0	73	39	1.87	0.02	0.02	1.12				
	Saltðalsvassdr..Saltð.fj.S	1544	1543	1168	32.1	38.5	32.1	32.1	32.1	1.62	3.1	92	56	1.25	0.03	0.03	0.94				
	Sultijelmavassdr...Saltð.fj	1028	800	791	44.0	46.2	44.0	44.0	44.0	39.86	1.1	112	59	20.98	0.06	0.06	0.78				
	Kobbe. Leirfj. Sørfolda N	405	405	386	66.9	78.3	66.9	66.9	66.9	1.92	0.9	56	32	0.68	0.02	0.02	0.17				
	Skjoma. Ofotfj. S	845	840	797	36.3	41.7	36.3	36.3	36.3	3.8	1.0	51	15	0.67	0.02	0.02	0.19				

Table 9.1 TRIBUTARY RIVERS. ANNUAL LOAD 1991.

County	Watercourse	Runoff data										Parameters (mean values)									
		Drainage area		Discharge				Conductivity mS/m	Total Phosphorus tons	Total Nitrogen tons	Nitrate-N tons	Copper tons	Zinc tons	Cadmium		Lead					
		Outlet kv.km	Sampl. station kv.km	Disch. gaug. station kv.km	Normal l/s kv.km	1991 l/s kv.km	gauging station 1991							zero tons	limit tons	zero tons	limit tons				
Troms (9.)	Spanselva. Astafj. Vågsfj.	142	142	533	50.0	55.0	50.0	0.9	0.2	19	5	0.20	0.18	0.00	0.00	0.13	0.13				
	Salangse.. Astafj. Vågsfj.	539	539	533	40.9	47.0	40.9	2.8	0.7	48	24	0.42	0.42	0.01	0.01	0.35	0.35				
	Rossfjorde.. Malangen	196	190		39.5	41.1	39.5	1.4	0.2	27	4	0.28	0.47	0.00	0.00	0.12	0.12				
	Målse.. Måselvfj. "	3239	3200	3118	28.7	27.9	28.7	11.6	5.8	290	116	4.34	4.63	0.06	0.06	1.16	1.16				
	Bardue.. Måselva	2906	2906	2049	28.3	27.9	28.3	5.52	5.2	257	93	3.89	4.15	0.05	0.05	1.04	1.04				
	Nordkjøselva. Balsfj.	191	191	415	27.7	30.5	27.7	0.7	0.3	8	3	0.18	0.13	0.00	0.00	0.07	0.07				
	Signaløselva. Lyngen V	473	467	415	27.7	34.6	27.7	1.6	0.4	26	12	0.65	2.28	0.01	0.01	0.29	0.29				
	Skibotnelva. Lyngen	770	770	724	18.0	28.2	18.0	1.7	0.4	35	14	0.44	0.79	0.01	0.01	0.17	0.17				
	Kåfjordelva. Lyngen Ø	358	358	348	20.0	35.1	20.0	2.94	0.9	23	13	0.43	0.34	0.00	0.00	0.09	0.09				
	Reisa. Reisafj.	2702	2702		16.0	20.0	16.0	3.01	1.4	119	42	1.91	2.05	0.03	0.03	0.55	0.55				
	Finnmark (10.)	Mattselva. Kåfj. Altafj.	325	325	319	26.5	33.1	26.5	1.4	0.3	22	5	0.16	0.81	0.01	0.01	0.24	0.24			
		Tverrelva. Altafj.	234	233	233	15.1	20.6	15.1	3.89	0.7	18	4	0.09	0.32	0.00	0.00	0.03	0.03			
		Repparfjordv.. Repparfj.	1090	1089		25.0	35.0	25.0	3.24	3.4	75	16	0.43	0.86	0.01	0.01	0.09	0.09			
		Stabburse..I. Porsangen V	1108	1102	870	18.3	22.0	18.3	2.56	2.5	55	10	3.18	0.70	0.01	0.01	0.89	0.89			
Lakse.. Indre Porsangen S		1533	1532	941	15.9	19.4	15.9	4.05	3.8	89	11	1.00	1.54	0.01	0.01	0.31	0.31				
Børselva.Indre Porsangen		883	883	863	29.8	35.2	29.8	3.32	2.5	37	9	0.41	5.64	0.00	0.01	0.66	0.66				
Mattusjåkka. I. Laksefj. V		101	101	101	22.8	27.4	22.8	4.00	0.4	7	1	0.04	0.15	0.00	0.00	0.03	0.03				
Storelva.Indre Laksefj. V		690	690	760	21.9	27.4	19.9	1.85	1.4	44	35	0.24	1.91	0.01	0.01	0.19	0.19				
Soussjåkka. I. Laksefj. V		92	92	102	25.3	31.6	22.8	4.22	0.2	5	2	0.04	0.23	0.00	0.00	0.03	0.03				
Adamselva. I. Laksefj. Ø		705	705	760	19.9	24.9	19.9	5.84	1.8	36	7	0.31	2.21	0.01	0.01	0.18	0.18				
Tanavassdraget. Tanafj. S	16389	15713	14169	11.5	13.8	11.5	34.2	5.7	923	57	5.70	9.12	0.23	0.23	5.98	5.98					
Vesterelva. Syltefj.	469	469	79	34.6	34.6	34.6	2.0	0.5	26	5	0.26	0.26	0.00	0.00	0.20	0.20					
V. Jakobse.. Y. Varangerfj.	627	627	239	18.1	18.3	18.1	4.84	1.8	29	4	0.29	1.43	0.00	0.00	0.14	0.14					
Passvike..Bøkfj. Varangfj.	18400	18400	18175	9.3	10.2	9.3	4.49	37.8	820	146	18.89	36.70	0.11	0.11	2.16	2.16					
Neiden. Munkfj. Varangfj.	2960	2960	2911	9.8	12.9	9.8	2.99	5.5	165	27	0.91	23.78	0.02	0.02	0.37	0.37					
Grense. Jakobse.. Varangfj.	234	234		18.0	18.2	18.0	5.04	0.7	13	2	0.29	0.17	0.00	0.00	0.04	0.04					

Table 9.2

**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		0.4	6.4 *	1.5 *	8.3	tonnes
Cadmium			6.6 **	1.5 **	8.5	tonnes
Mercury		314	41 *	26 *	381	kg
Mercury			301 **	139 **	754	kg
Copper		51	204	135	391	tonnes
Zinc		78	630	469	1177	tonnes
Lead		13.2	69.4 *	19.9 *	102.6	tonnes
Lead			70.3 **	20.5 **	104.0	tonnes
Arsenic		0.5			0.5	tonnes
Cr-T		112.7			112.7	tonnes
Cr-T					112.7	tonnes
PCBs ***			0.2 *	0.1 *	0.4	kg
PCBs			56.3 **	22.9 **	79.2	kg
gamma-HCH			231	50	281	kg
NO3-N	15150	11.2	16703	16557	33271	tonnes
PO4-P	208	694.8	205	318	1218	tonnes
Total N	24259	14447	30064	27896	96667	tonnes
Total P	791	1387	815	787	3781	tonnes
S.P.M.		4556472	248399	220553	5025424	tonnes
TOC		21339			21339	tonnes
DOC						tonnes
COD		265939			265939	tonnes
BOD		39440			39440	tonnes
AOX		1077			1077	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		0.16	1.5 *	1.1 *	2.7	tonnes
Cadmium			1.5 **	1.1 **	2.7	tonnes
Mercury		136.19	31 *	26 *	193	kg
Mercury			44 **	106 **	286	kg
Copper		26.62	19	92	137	tonnes
Zinc		27.39	171	361	560	tonnes
Lead		2.34	9.2 *	16.0 *	27.5	tonnes
Lead			9.2 **	16.0 **	27.5	tonnes
Arsenic		0.48			0.5	tonnes
Cr-T		8.69			8.7	tonnes
Cr-T					8.7	tonnes
PCBs ***			0.0 *	0.0 *	0.0	kg
PCBs			12.1 **	17.0 **	29.1	kg
gamma-HCH			55	43	99	kg
NO3-N	1872	5	4086	14795	18886	tonnes
PO4-P	21	192	31	285	509	tonnes
Total N	2910	7124	6927	24482	41443	tonnes
Total P	83	425	141	693	1342	tonnes
S.P.M.		18883	23121	200637	242641	tonnes
TOC		9530			9530	tonnes
DOC						
COD		176392			176392	tonnes
BOD		13940			13940	tonnes
AOX		1077			1077	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. LII)).**

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

Substance:	Area runoff	Direct Discharges	Tributary Inputs	Main Riverine Inputs	Grand Total	
Cadmium		0.19	1.2 *	0.0 *	1.5	tonnes
Cadmium			1.4 **	0.0 **	1.6	tonnes
Mercury		103.59	0 *	0 *	104	kg
Mercury			87 **	7 **	197	kg
Copper		14.43	50	3	68	tonnes
Zinc		31.42	193	17	241	tonnes
Lead		9.36	17.3 *	0.0 *	26.7	tonnes
Lead			18.1 **	0.4 **	27.9	tonnes
Arsenic		0.04			0.0	tonnes
Cr-T		8.10			8.1	tonnes
Cr-T					8.1	tonnes
PCBs ***			0.0 *	0.0 *	0.0	kg
PCBs			15.2 **	1.2 **	16.4	kg
gamma-HCH			136	4	140	kg
NO3-N	5773	3	7519	921	8442	tonnes
PO4-P	56	236	54	9	299	tonnes
Total N	9318	3005	10955	1124	24402	tonnes
Total P	199	431	231	22	883	tonnes
S.P.M.		1822362	36616	4318	1863295	tonnes
TOC		5356			5356	tonnes
DOC						tonnes
COD		35728			35728	tonnes
BOD		11429			11429	tonnes
AOX		0			0	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		0.09	3.2 *	0.3 *	3.6	tonnes
Cadmium			3.3 **	0.3 **	3.6	tonnes
Mercury		69.61	10 *	0 *	80	kg
Mercury			134 **	22 **	226	kg
Copper		9.78	103	36	149	tonnes
Zinc		17.92	180	85	283	tonnes
Lead		1.47	31.4 *	3.9 *	36.8	tonnes
Lead			31.4 **	3.9 **	36.8	tonnes
Arsenic		0.00			0.0	tonnes
Cr-T		95.57			95.6	tonnes
Cr-T					95.6	tonnes
PCBs ***			0.1 *	0.0 *	0.1	kg
PCBs			22.9 **	3.8 **	26.7	kg
gamma-HCH			33	3	36	kg
NO3-N	6491	3	4758	678	5439	tonnes
PO4-P	113	253	102	13	367	tonnes
Total N	10347	4123	9818	1746	26033	tonnes
Total P	421	507	343	47	1318	tonnes
S.P.M.		1114630	169132	11948	1295711	tonnes
TOC		6107			6107	tonnes
DOC						tonnes
COD		52280			52280	tonnes
BOD		13359			13359	tonnes
AOX		0			0	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		0.01	0.4 *	0.11 *	0.5	tonnes
Cadmium			0.4 **	0.11 **	0.5	tonnes
Mercury		4.38	0 *	0.00 *	4	kg
Mercury			35 **	5.25 **	45	kg
Copper		0.61	32	3.68	37	tonnes
Zinc		0.88	86	6.30	93	tonnes
Lead		0.07	11.5 *	0.00 *	11.6	tonnes
Lead			11.5 **	0.26 **	11.9	tonnes
Arsenic		0.00			0.0	tonnes
Cr-T		0.35			0.4	tonnes
Cr-T					0.4	tonnes
PCBs ***			0.1 *	0.13 *	0.2	kg
PCBs			6.1 **	0.92 **	7.1	kg
gamma-HCH			6	0.24	7	kg
NO3-N	1013	0.19	340	162.77	503	tonnes
PO4-P	18	14.27	18	10.76	43	tonnes
Total N	1685	194.68	2365	543.43	4788	tonnes
Total P	88	24.30	100	25.73	238	tonnes
S.P.M.		1600597	19530	3649.14	1623777	tonnes
TOC		345.89			346	tonnes
DOC						tonnes
COD		1539.43			1539	tonnes
BOD		711.77			712	tonnes
AOX		0.00			0	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 1991 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 ?	Precisio of the estimate of the load	
Sub-areas :	1A	1B	2	3	4	5			
Substance:									
Cd *	0.12	0.08	0.00	0.03	0.10	1.17	tonnes	YES	_____ %
Cd **	0.12	0.08	0.00	0.03	0.10	1.18	tonnes		_____ %
Hg *	0.13	0.00	0.00	0.00	0.00	30.50	kg	NO	_____ %
Hg **	2.20	0.99	0.31	1.21	2.02	37.56	kg		_____ %
Cu	1.7	5.2	0.3	0.9	1.7	8.8	tonnes	YES	_____ %
Zn	5.5	11.2	1.9	3.8	17.4	131.5	tonnes	YES	_____ %
Pb *	0.40	1.46	0.04	0.35	0.25	6.65	tonnes	YES	_____ %
Pb **	0.40	1.46	0.04	0.35	0.25	6.65	tonnes		_____ %
PCBs *	0.00	0.00	0.00	0.00	0.00	0.00	kg	NO	_____ %
PCBs **	0.38	7.74	0.14	0.01	0.35	3.47	kg		_____ %
gamma-HCH	4.34	1.15	0.39	0.43	5.33	43.78	kg	YES	_____ %
NO3-N	767	291	140	604	273	2011	tonnes	YES	_____ %
PO4-P	5.7	5.1	7.8	5.1	1.0	6.6	tonnes	YES	_____ %
Total N	1242	585	197	802	432	3669	tonnes	YES	_____ %
Total P	24	19	12	15	4	68	tonnes	YES	_____ %
S.P.M.	2718	3689	552	1651	1303	13208	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 1991 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 *	0.31	0.92	tonnes YES	_____ %
Cd **	0.36	1.06	tonnes	_____ %
Hg *	0.00	0.00	kg NO	_____ %
Hg **	29.42	57.37	kg	_____ %
Cu	23.3	26.6	tonnes YES	_____ %
Zn	100.1	92.6	tonnes YES	_____ %
Pb *	8.52	8.80	tonnes YES	_____ %
Pb **	8.52	9.62	tonnes	_____ %
PCBs *	0.00	0.00	kg NO	_____ %
PCBs **	5.15	10.04	kg	_____ %
gamma-HCH	77.36	58.70	kg YES	_____ %
NO3-N	3870	3648	tonnes YES	_____ %
PO4-P	29.8	23.8	tonnes YES	_____ %
Total N	5454	5501	tonnes YES	_____ %
Total P	106	125	tonnes YES	_____ %
S.P.M.	15288	21328	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 1991 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 *	2.45	0.80	tonnes YES	_____ %
Cd **	2.47	0.80	tonnes	_____ %
Hg *	10.41	0.00	kg NO	_____ %
Hg **	76.39	57.99	kg	_____ %
Cu	54.6	48.8	tonnes YES	_____ %
Zn	102.1	78.3	tonnes YES	_____ %
Pb *	18.83	12.59	tonnes YES	_____ %
Pb **	18.83	12.59	tonnes	_____ %
PCBs *	0.00	0.13	kg NO	_____ %
PCBs **	12.76	10.15	kg	_____ %
gamma-HCH	18.54	14.63	kg YES	_____ %
NO3-N	3742	1016	tonnes YES	_____ %
PO4-P	60.0	41.9	tonnes YES	_____ %
Total N	7522	2296	tonnes YES	_____ %
Total P	218	125	tonnes YES	_____ %
S.P.M.	80871	88261	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 1991 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 *	0.41	tonnes YES	_____ %
Cd **	0.43	tonnes	_____ %
Hg *	0.00	kg NO	_____ %
Hg **	35.10	kg	_____ %
Cu	32.2	tonnes YES	_____ %
Zn	85.8	tonnes YES	_____ %
Pb *	11.55	tonnes YES	_____ %
Pb **	11.55	tonnes	_____ %
PCBs *	0.09	kg NO	_____ %
PCBs **	6.14	kg	_____ %
gamma-HCH	6.50	kg YES	_____ %
NO3-N	340	tonnes YES	_____ %
PO4-P	17.9	tonnes YES	_____ %
Total N	2365	tonnes YES	_____ %
Total P	100	tonnes YES	_____ %
S.P.M.	19530	tonnes YES	_____ %

Measurements below detection limits are treated in two ways :

*) Detection limit = Zero

**) Detection limit = Limit

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