



## Aluminium

### Freshwater

(pH > 6.5)

Fails HR

#### MR Calculations

1253.57	9212.49	92086.92	8355.22	55500	35000
599	3600	512.05			

HC1 50%	=	219.23
HC5 50%	=	439.97
HC10 50%	=	673.86
HC20 50%	=	1203.77

**NOTE:** Because this TV is derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all combined species is 8.17.

MR TV =  $439.97 \div 8.17 = 53.85 = 54 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
26.83	53.85	82.48	147.34

These were rounded off to

27	55	80	150
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(pH < 6.5)

Fails HR and MR

#### Interim Calculation

Interim TV	=	lowest value $\div$ AF or ACR
	=	$15 \div 20$
	=	$0.75 \mu\text{g/L}$
	$\approx$	$0.8 \mu\text{g/L}$

An AF of 20 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## Marine

There were only chronic toxicity data for 1 species. Therefore a HR TV could not be derived.

There were only acute toxicity data for 6 species belonging to 3 taxonomic groups (crustacea, annelida and mollusca). Therefore, a MR TV could not be derived.

When the acute and chronic toxicity data were combined there were data for 7 species belonging to the same 3 taxonomic groups as the acute data. Therefore, an interim TV could not be derived. Only an ECL could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div \text{AF} \\
&= 97 \div 200 \\
&= 0.485 \\
&\approx 0.5 \mu\text{g/L}
\end{aligned}$$

An AF of 200 was used because the use of an AF of 1000 was considered excessive for such a commonly found element.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Antimony**

### **Freshwater**

#### **Fails HR and MR**

There were toxicity data for 3 species which belonged to 3 taxonomic groups (fish, crustacea and annelida).

Therefore Only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 9000 \mu\text{g/L} \div 1000 \\
&= 9 \mu\text{g/L}
\end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine**

There were only toxicity data for three marine species which belonged to two different taxonomic groups — fish and crustacea.

Therefore only a LR (ECL) TV could be derived.

The lowest value was not used to derive the ECL as it was markedly different from other values for the same species (i.e. 53.4 compared to 267 000  $\mu\text{g/L}$ ). Therefore the next lowest value was used.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 267\,000 \mu\text{g/L} \div 1000 \\
&= 267 \mu\text{g/L} \\
&\approx 270 \mu\text{g/L}
\end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Arsenic (III)**

### **Freshwater**

#### **HR Calculations**

890	6751.14	955	290.81	961	9250.92
961	8420	417.45	4284.89	961	3823
15.74					

$$\begin{aligned}
\text{HC1 50\%} &= 1.05 \\
\text{HC5 50\%} &= 24.21 \\
\text{HC10 50\%} &= 93.52 \\
\text{HC20 50\%} &= 361.21
\end{aligned}$$

$$\text{TV (Burr HC5 50\%)} = 24$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
1.05	24.21	93.52	361.21

These were rounded off to

1	24	94	360
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## Marine

There were no screened marine toxicity data. However, there were unscreened USEPA data for 12 species — the lowest value being 232 µg/L. Even though there were sufficient data to derive a MR TV a LR (interim) was derived because the data were unscreened.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 232 \text{ } \mu\text{g/L} \div 100 \\ &= 2.32 \text{ } \mu\text{g/L} \\ &\approx 2.3 \text{ } \mu\text{g/L} \end{aligned}$$

## Arsenic (V)

### Freshwater

#### HR Calculations

22.63	510.84	973	973	973
973	973	9.80	7843.60	15 886

HC1 50%	=	0.76
HC5 50%	=	12.54
HC10 50%	=	42.08
HC20 50%	=	143.28

$$\text{TV (Burr HC5 50\%)} = 12.45 = 12.5 \text{ } \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.76	12.54	42.08	143.28

These were rounded off to

0.8	13	42	140 µg/L
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## Marinewater

### Fails HR and MR

The highest level of TV that could be derived was the LR (ECL) TV. There were only pH data for 2 of the 10 data. But it is marine water — the stated pH range is 6.7-8.2.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 893 \div 200 \\ &= 4.465 \\ &\approx 4.5 \text{ } \mu\text{g/L} \end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

## **Bismuth**

### **Freshwater**

#### **Fails HR and MR**

There were only three toxicity data and these were insufficient to derive an interim (LR) TV. Only a LR (ECL) TV could be derived. However, none of the data recorded the pH.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 662 \div 1000 \\ &= 0.7 \end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine water**

There were no marine toxicity data. Therefore no marine TV could be derived.

## **Boron**

### **Freshwater**

#### **HR Calculations**

The data used in the calculations were:

6945.5	357.77	4651.02	4665	1000	10940
4993.38	32244.07	22600	1323.52		

HC1 50%	=	93.60
HC5 50%	=	367.5
HC10 50%	=	682.4
HC20 50%	=	1335

TV (Burr HC5 50%) = 370 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
93.6	367.5	682.4	1335

These were rounded off to

90	370	680	1300 µg/L
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## **Marine water**

There were no toxicity data for marine species. Therefore no TV could be derived.

## Cadmium Freshwater HR Calculations

The data used in the calculations were:

10.22	3.2	0.38	0.08	1.65	2.46
121.68	3.31	8.2	23.21	0.83	0.52
474	112	250.36	0.63	20.72	0.49
5.72	243.8	766.88			

HC1 50%	=	0.064
HC5 50%	=	0.19
HC10 50%	=	0.35
HC20 50%	=	0.81

$$\text{HR TV (Burr HC5 50\%)} = 0.19 = 0.2 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.064	0.19	0.35	0.81

These were rounded off to

0.06	0.2	0.4	0.8 $\mu\text{g/L}$
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## Marine HR Calculations

The data used in the calculations were:

3025.23	10	140	1040	132.37
168.71	5.7	20	62	240
138.56	437.95	322.69	4400	22
430	262	340	123.64	400
1069.63	200	64.81	2.75	2.96
228.07	3200	92.46	1280	68.99
7.05	140	412.55	29.39	260
3058.10	143.6	4472.14	98	332.76
15.60	12393.55	14.04	2529.46	

HC1 50%	=	0.71
HC5 50%	=	5.51
HC10 50%	=	13.71
HC20 50%	=	36.38

$$\text{HR TV (Burr HC1 50\%)} = 0.71 = 0.7 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because Cadmium can bioaccumulate in marine systems and in-order to provide adequate protection to marine crustaceans that showed low chronic toxicity.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.71	5.51	13.71	36.38

These were rounded off to

0.7	5.5	14	36 µg/L
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## **Chromium (III)**

### **Freshwater**

#### **Fails HR and MR**

There were only chronic toxicity data for 6 species that belong to 3 taxonomic groups (fish, crustacea and amphibia). Therefore, a HR TV can not be derived.

There were only acute toxicity data for species that belong to 2 taxonomic groups (fish and crustacea). Therefore, a MR TV can not be derived.

There is in total, toxicity data for 3 taxonomic groups (fish, crustacea and amphibia) therefore, an LR (interim) TV could not be derived. However, there was an unscreened chronic toxicity value to a freshwater alga reported by the USEPA of 397 µg/L. Using this value allowed an LR (interim) TV to be derived.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 20 \\ &= 66.2 \div 20 \\ &= 3.31 \\ &\approx 3.3 \text{ } \mu\text{g/L} \end{aligned}$$

An AF of 20 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine**

### **MR Calculations**

The data used in the calculations were:

19270	53000	10300	2598.08	100000
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Because toxicity data were limited to less than eight species, the Burr Type III distribution was applied with caution (as per the directions in the BurrliOZ software section of the 'TOX-Read Me' File on the CD-ROM and Internet site). The fit of the log-logistic and the selected Burr Type III distributions to the data were compared. This showed that the log-logistic distribution fitted the data better than the selected Burr Type III distribution. Therefore, the Trigger Value and other levels of protection were calculated using the log-logistic distribution.

HC1 50%	=	597.37
HC5 50%	=	2125.69
HC10 50%	=	3770.39
HC20 50%	=	7028.75

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 77.58.

$$\text{MR TV} = 2125.70 \div 77.58 = 27.4 = 27 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
7.7	27.39	48.60	90.60

These were rounded off to

8.0	27	48.6	90.6 $\mu\text{g/L}$
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## **Chromium (VI)**

### **Freshwater**

#### **HR Calculations**

The data used in the calculations were:

183.45	1060	1000	28 002.05	5 744.56
4.733	1000	49.506	32.53	19 000
30	1 729.50	63.82	1182.6	208.13
2 250.9	2 537.61	85.24	0.102	

HC1 50%	=	0.014
HC5 50%	=	1.0
HC10 50%	=	6.24
HC20 50%	=	39.21

$$\text{TV (Burr HC5 50\%)} = 1.0$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.014	1	6.24	39.21

These were rounded off to

0.01	1	6	40 $\mu\text{g/L}$
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## **Marine**

### **HR Calculations**

The data used in the calculations were:

2 000	12.50	200	4	56
262.39	770.06	1267.02	3 346.64	39.77
81.70	2 902.71	187.2	94.57	4.74
8 800	9 998.74	1600	705.72	2 000
5	728	1 130.94	140	176.64
540	1456	2501.2	1 200	478.48
1 174.07	9.55	3 123.20	916.55	1 993.31
195.97				

HC1 50%	=	0.14
HC5 50%	=	4.36
HC10 50%	=	19.32



$$\begin{aligned} \text{HC20 50\%} &= 85.53 \\ \text{HR TV (Burr HC5 50\%)} &= 4.36 = 4.4 \mu\text{g/L} \end{aligned}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.14	4.36	19.32	85.53

These were rounded off to

0.14	4.4	20	85 $\mu\text{g/L}$
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## **Cobalt**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

522	2475.06	612872	80909.83	4000	2478.38
15500	8800	10200	102000	10002.31	12000
32000					

HC1 50%	=	306.7
HC5 50%	=	920.5
HC10 50%	=	1599
HC20 50%	=	3085

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR. The resulting TV did not provide adequate protection to the species for which chronic toxicity data were available.

Therefore the TV was based on the HC1 50% value. However, there were chronic toxicity values which were considerably below the suggested TV. This was particularly the case for *Daphnia magna* which is an important zooplankton species.

Therefore, in this case a LR (interim) TV was derived. An AF of 2 rather than the default value of 10 was used as cobalt is an essential element.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div \text{AF} \\ &= 2.8 \div 2 \\ &= 1.4 \mu\text{g/L} \end{aligned}$$

Lower levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine**

### **HR Calculations**

The data used to derive the TV were:

45400	9080	60	64.21	18800
9.08	3103.03	10500		

HC1 50%	=	0.0047
HC5 50%	=	1.254
HC10 50%	=	13.88
HC20 50%	=	153.7

TV (Burr HC5 50%) = 1.25 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.004717	1.254	13.88	153.7

These were rounded off to

0.005	1	14	150 µg/L
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## Copper Freshwater HR Calculations

The data used to derive the TV were:

20.34	32.86	26.4	8.24	6.50	2.98
5.73	130.83	23.2	2.56	2.12	2.48
1.7	1.68	4.2	10.18	11.04	2.22
5.33	1.64				

HC1 50%	=	0.97
HC5 50%	=	1.43
HC10 50%	=	1.80
HC20 50%	=	2.48

TV (Burr HC5 50%) = 1.43

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.9735	1.427	1.802	2.48

These were rounded off to

1	1.4	1.8	2.5 µg/L
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## Marine HR Calculations

The data used in the calculations were:

2.08	30.2	122	48.44	40	6514.5
5.10	620	20	500	3	1.98
30	32	126.91	10.2	260	42
27.5	0.4	17.0	66.95	20000	17.66
446.68	400				

HC1 50%	=	0.20
HC5 50%	=	1.29
HC10 50%	=	3.04
HC20 50%	=	7.78

TV (Burr HC5 50%) = 1.39

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.2	1.29	3.04	7.78

These were rounded off to

0.2	1.3	3	8 µg/L
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## **Gallium**

### **Freshwater**

#### **Fails HR and MR**

There was only one acceptable piece of data and it is for a fish. Therefore, only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= 3510 \div 200 && \text{(used an AF of 200 as lowest value was chronic)} \\ &= 17.5 \\ &\approx 18 \mu\text{g/L} \end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

### **Marine water**

There was no toxicity data for marine species. Therefore no TV could be derived.

## **Iron**

The Canadian water quality guideline was adopted for iron.

## **Lanthanum**

### **Freshwater**

There were no screened toxicity data. There was only one unscreened datum (a 48h EC50) for *Daphnia carinata* (Barry & Meehan, unpublished). Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= 43 \div 1000 \\ &= 0.043 \\ &\approx 0.04 \mu\text{g/L} \end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

### **Marine**

There were no toxicity data for marine species therefore no TV could be derived.

## Lead Freshwater HR Calculations

The data used in the calculation were:

67.6	5.65	11.12	27.95	27.89	19.48
5.11	28.4				

HC1 50%	=	1.02
HC5 50%	=	3.36
HC10 50%	=	5.62
HC20 50%	=	9.44

TV (Burr HC5 50%) = 3.4 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
1.02	3.36	5.62	9.44

These were rounded off to

1	3.4	5.6	9.4 µg/L
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## Marine HR Calculations

The data used to derive the TV were:

340.25	12.02	8	25	8	891.92	622
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HC1 50%	=	2.23
HC5 50%	=	4.35
HC10 50%	=	6.56
HC20 50%	=	11.47

TV (Burr HC5 50%) = 4.35 µg/L = 4 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2.23	4.35	6.56	11.47

These were rounded off to

2.2	4.4	6.6	12 µg/L
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## **Manganese**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used in the calculations were:

220325.1	981817.7	21116.65	38700	28000
51000	506698.1	310000	1040000	130000
33800	38700			

HC1 50%	=	10775
HC5 50%	=	17013
HC10 50%	=	22500
HC20 50%	=	32915

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The only ACR for Manganese was 9.08.

MR TV =  $17013 \div 9.08 = 1873.7 \approx 1900 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
1186.7	1873.7	2477.9	3625.03

These were rounded off to

1200	1900	2500	3600
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## **Marine**

There were only toxicity data for 6 species that belong to 3 taxonomic groups. The data failed the minimum data requirements for HR, MR and interim TVs.

Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV	=	lowest value $\div$ 200
	=	$16000 \mu\text{g/L} \div 200$
	=	$80 \mu\text{g/L}$

An AF of 200 was used as the lowest toxicity value was chronic.

The lower values of 10 and 1500 were not used because they were (a) not reliable and (too short term) respectively and (b) converted NOEC data was not used to derive LR TVs.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## Mercury Freshwater HR Calculations

The data used to derive the TV were:

12.65	71.13	34.69	1.0412
29.15	2.569	48.86	

HC1 50%	=	0.056
HC5 50%	=	0.65
HC10 50%	=	1.89
HC20 50%	=	5.45

TV (Burr HC1 50%) = 0.056 µg/L = 0.06 µg/L

The HC1 50% was adopted for slight to moderately modified ecosystem protection because Mercury bioaccumulates.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.056	0.65	1.89	5.45

These were rounded off to

0.06	0.6	1.9	5.4
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## Marine HR Calculations

4.11	4	4	20	2.4
2	1.34	4.1134	4.1134	8.53
2.94	59.53	0.8	0.36	0.12
140	7.82	12	840	10
4.11	88			

HC1 50%	=	0.10
HC5 50%	=	0.36
HC10 50%	=	0.66
HC20 50%	=	1.36

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

TV (Burr HC1 50%) = 0.10 µg/L

The HC1 50% was adopted for slight to moderately modified ecosystem protection because Mercury bioaccumulates.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.1	0.36	0.66	1.36

These were rounded off to

0.1	0.4	0.7	1.4 µg/L
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## **Molybdenum**

### **Freshwater**

#### **Fails HR and MR**

There were insufficient data (4 species belonging to 3 taxonomic groups) to derive a HR or MR TV. Only an LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (Interim) TV} &= \text{lowest value} \div 20 \\ &= 670 \div 20 \\ &= 34 \text{ ug/L}\end{aligned}$$

An AF of 20 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine**

There were only toxicity data for 2 species that belong to 1 taxonomic group.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 4500 \text{ µg/L} \div 200 \\ &= 22.5 \\ &\approx 23 \text{ µg/L}\end{aligned}$$

An AF of 200 was used as Molybdenum is an essential element.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Nickel**

### **Freshwater**

#### **HR Calculations**

The data used in the calculation were:

31.4	93.39	13.67	39.46	151.4	13.48
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HC1 50%	=	7.88
HC5 50%	=	10.89
HC10 50%	=	13.27
HC20 50%	=	17.36

$$\text{HR TV (Burr HC5 50\%)} = 10.89 = 11 \text{ µg/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
7.88	10.89	13.27	17.36

These were rounded off to

8	11	13	17 µg/L
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## **Marine HR Calculations**

The data used to derive the TV were:

2456	2600	1702.14	240	30000
22636.09	1140	22400	3200	1540
5000	6000	160	141	50

The values of 141 and 50 are not in the database. These were obtained quite late in the derivation process and we do not have all the details required for the database. However, we know sufficient to class them both as reliable data. The value of 141 µg/L is a chronic toxicity value for *Mysidopsis bahia* obtained from the USEPA (1986) and background data. The value of 50 was obtained by dividing a chronic EC50 (population growth) value of 250 µg/L to *Nitzschia closterium* (Florence et al. 1994) by 5 to obtain a converted NOEC value.

HC1 50%	=	6.74
HC5 50%	=	71.25
HC10 50%	=	198.12
HC20 50%	=	562.97

$$\text{HR TV (Burr HC1 50\%)} = 70 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the HC5 50% was not considered to offer sufficient protection to the most sensitive species for which there were acute toxicity data (*P. pelagicus* and a mysid).

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
6.74	71.25	198.1	562.9

These were rounded off to

7	70	200	560 µg/L
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## **Selenium (Total ie. Se IV & Se VI) Freshwater HR Calculations**

The data used in the calculation were:

276.33	69.91	14	120	16500.62
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**NOTE:** The pH of the test solutions in which these tests were conducted varied from 7.3 to 7.98 and therefore was within the acceptable pH range of 6.5-9. The value of 16 595.87 is a noticeable outlier.



However, if this value is removed then the data does not meet the minimum data requirements of the statistical extrapolation method.

HC1 50%	=	5.35
HC5 50%	=	11.31
HC10 50%	=	17.89
HC20 50%	=	33.86

NOTE: This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{HR TV (Burr HC1 50\%)} = 5.35 = 5.4 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because Selenium bioaccumulates.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
5.35	11.31	17.89	33.86

These were rounded off to

5.4	11.3	18	34 $\mu\text{g/L}$
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## Marine

There were only toxicity data for 3 different taxonomic groups (fish, crustacea and mollusca) and there were no algae. However, while the alga did not pass the screening process it was used in this case so that a MR (interim) TV could be derived. This was done as the data does give an indication of the sensitivity of alga and it did not drive the size of the TV — it only modifies the size of the AF.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 255 \div 100 \\ &= 2.55 \\ &\approx 3 \mu\text{g/L}\end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## Selenium (IV)

### Freshwater

There were only toxicity data for 6 species of fish. Therefore only an LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 2250 \div 200 \\ &= 11.25 \\ &\approx 11 \mu\text{g/L}\end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

### Marine water

There were no screened toxicity data for marine species. There was however, an un-screened 72 h EC<sub>50</sub> figure > 2 mg/L reported for *Nitzschia closterium* (Florence et al. 1994). Because it is a “greater than” toxicity value it could not be used to derive a TV. Therefore no TV could be derived.

## Silver

### Freshwater

#### HR Calculation

The data used in the calculation were:

48.00	0.16	0.44	0.24	5.84
22	0.079	280.0		

HC1 50%	=	0.020
HC5 50%	=	0.054
HC10 50%	=	0.098
HC20 50%	=	0.22

TV (Burr HC5 50%) = 0.06 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.020	0.054	0.098	0.22

These were rounded off to

0.02	0.05	0.1	0.2 µg/L
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## Marine

### HR Calculations

The data used to derive the TV were:

1.55	5.0	1.6	6.48	14.09
6.0	34.41	6.0		

HC1 50%	=	0.76
HC5 50%	=	1.35
HC10 50%	=	1.81
HC20 50%	=	2.59

TV (Burr HC5 50%) = 1.35 = 1.4 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.76	1.35	1.81	2.59

These were rounded off to

0.8	1.4	1.8	2.6 µg/L
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## Thallium

### Freshwater

#### Fails HR and MR

An LR (interim) TV could be derived if the algae toxicity data was accepted. The problem is that the pH of the alga data ranged from 2.2-8, which is outside the normal acceptable range. The remainder of

data had a pH range of 7.5-8.6. The alga data was accepted because although it was outside the normal pH range it gave an indication of algal sensitivity and it would not drive the TV. Therefore a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 20 \\ &= 0.5 \div 20 \\ &= 0.03 \mu\text{g/L}\end{aligned}$$

An AF of 20 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine Fails HR and MR**

There were toxicity data for 6 species that belonged to 3 taxonomic groups; fish, crustacea and diatoms. Therefore, an LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 20 \\ &= 330 \div 20 \\ &= 16.5 \mu\text{g/L}\end{aligned}$$

An AF of 20 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Tin Freshwater Fails HR and MR**

There were no chronic toxicity data and only acute toxicity data for 2 species which belonged to 2 taxonomic groups (insecta and annelida).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 3000 \mu\text{g/L} \div 1000 \\ &= 3 \mu\text{g/L}\end{aligned}$$

## **Marine Fails HR and MR**

There were chronic toxicity data for 2 species that belonged to 1 taxonomic group — diatom.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 200 \div 200 \\ &= 1 \mu\text{g/L}\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

There was however, a number of unscreened toxicity data available from Mance et al. (1988). These data indicate that there were no toxic effects on crustaceans and fish at concentrations up to the

maximum aqueous solubility. Mance et al. (1988) recommended a TV of 0.25 times the aqueous solubility of inorganic tin in seawater (ie 10 µg/L). This value is consistent with the LR (ECL) TV derived in this study and was therefore adopted.

$$\text{LR TV} = 10 \mu\text{g/L}$$

## **Tributyltin Freshwater Fails HR and MR**

There were toxicity data for 3 species which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2.2 \mu\text{g/L} \div 1000 \\ &= 0.0022 \\ &= 0.002 \mu\text{g/L} \end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine HR Calculations**

The data used to derive the TV were:

0.6	0.0042	0.13	0.043	0.368	11.37
1.35	0.44				

HC1 50%	=	0.0004
HC5 50%	=	0.0055
HC10 50%	=	0.017
HC20 50%	=	0.054

$$\text{HR TV (Burr HC5 50\%)} = 0.0055 = 0.006 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0004	0.0055	0.017	0.054

These were rounded off to

0.0004	0.006	0.02	0.05 µg/L
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## **Uranium Freshwater Fails HR and MR**

There were only chronic toxicity data for 4 species which belonged to 3 taxonomic groups (fish, crustacea and hydra). Therefore a HR TV could not be derived.

There were only acute toxicity data for 8 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only an LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (Interim) TV} &= \text{lowest value} \div 20 \\ &= 10 \mu\text{g/L} \div 20 \\ &= 0.5 \mu\text{g/L}\end{aligned}$$

An AF of 20 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## Marine

There were no toxicity data for marine species. Therefore no TV could be derived.

## Vanadium

### Freshwater

#### Fails HR and MR

There were only toxicity data for 7 species that belonged to 3 taxonomic groups. The alga data were conducted at a pH between 2.2 and 8. Such data is outside the acceptable range and would normally be excluded. However, in this case the data was included as only an interim could be derived and the alga data was not the lowest and therefore would not affect the magnitude of the TV.

$$\begin{aligned}\text{LR (Interim) TV} &= \text{lowest value} \div 20 \\ &= 120 \div 20 \\ &= 6 \mu\text{g/L}\end{aligned}$$

An AF of 20 was used as the lowest toxicity value was chronic.

The other levels of protection could not be calculated as the TV was derived using the AF method.

## Marine

### HR Calculations

The data used to derive the TV were:

400	7000	100	13000	2000	600
HC1 50%	=	46.49			
HC5 50%	=	100.2			
HC10 50%	=	155.9			
HC20 50%	=	277.7			

$$\text{TV (Burr HC5 50\%)} = 100$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
46.49	100.2	155.86	277.7

These were rounded off to

50	100	160	280 $\mu\text{g/L}$
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## Zinc

### Freshwater

#### HR Calculations

The data used to derive the TV were:

180.4	25.30	5.52	21.04	18480	650
189.4	226.14	370.8	53.73	60.4	71.05
1182.84	102.4	65	560	108.85	253.16
1120	5				

Note that the data for *Salmo salar* were not used to derive the TV as the experiments were conducted at pH outside the acceptable pH range.

HC1 50%	=	2.35
HC5 50%	=	7.99
HC10 50%	=	14.82
HC20 50%	=	31.04

$$\text{TV (Burr HC5 50\%)} = 7.99 = 8 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2.35	7.99	14.82	31.04 $\mu\text{g/L}$

These were rounded off to

2.4	8	15	31 $\mu\text{g/L}$
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## Marine

### HR Calculations

The data used in the calculation were:

14.77	39.6	460	277.7	611.29	391.43
15	5059.64	490.87	20	10400	27465.96
620	89.26	1480	128	520	46.51
13	393.49	40	2100	561.44	65

HC1 50%	=	6.78
HC5 50%	=	14.43
HC10 50%	=	22.89
HC20 50%	=	42.92

$$\text{TV (Burr HC5 50\%)} = 14.43 = 14.4 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
6.78	14.43	22.891	42.92

These were rounded off to

7	15	23	43 $\mu\text{g/L}$
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## Ammonia Freshwater HR Calculation

The data, expressed in mg/L, used to derive the TV were:

8.81	4.79	3.27	19.72	6.15	4.16
4.88	1.35	4.56	2.62	0.54	1.79
4.4	19.77	13.03	17.14		

HC1 50%	=	0.32 mg/L
HC5 50%	=	0.90 mg/L
HC10 50%	=	1.43 mg/L
HC20 50%	=	2.32 mg/L

$$\text{TV (Burr HC5 50\%)} = 0.90 \text{ mg/L} = 900 = 900 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
320	900	1430	2320

These were rounded off to

320	900	1430	2300 $\mu\text{g/L}$
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The 95% figure was considered sufficiently protective of most *slightly-moderately disturbed* systems. However, this figure may not be sufficiently protective of the freshwater clam *Sphaerium novazelandiae* and related species. If this species is significant at a site, site-specific studies or a higher protection level may be warranted.

## Marine Fails HR MR Calculation

The data, expressed in mg/L, used to derive the TV were:

21402.62	44895.93	8779.25	158046.99	18686.99	49167.96
77461.35	25666.30	103592.88	33671.95	40260.72	46089.98
26460.07	20850.18	264345.15	25666.3	105583.76	26069.71
42755.01	7724.08	142210.4			

HC1 50%	=	5745
HC5 50%	=	10426
HC10 50%	=	13989
HC20 50%	=	19750

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 11.49.

$$\text{MR TV} = 10426 \div 11.49 = 907.398 = 910 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
500	907.398	1217.493	1718.885

These were rounded off to

500	910	1200	1700 µg/L
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## **Chlorine** (expressed as chlorine — µg Cl/L)

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used in the calculation were:

131.04	580	390	787.49	351	137.56
23.28	28.30	77.47	854.17	75.90	470
1010	487.35	10459.74	7101	1070	1350
2176.44					

HC1 50%	=	4.18
HC5 50%	=	26.47
HC10 50%	=	58.94
HC20 50%	=	133.56

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 2.36.

$$\text{MR TV} = 26.47 \div 2.36 = 11.22 = 11 \mu\text{g/L}$$

However, the above TV was not adopted because there were acute toxicity values of 5 & 6 for *D. magna*. Therefore, a default AF of 10 rather than the ACR of 2.36 was used to derive the TV. This is shown below.

$$\text{MR TV} = 26.47 \div 10 = 2.647 = 2.6 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.418	2.647	5.894	13.356

These were rounded off to

0.4	3	6	13 µg/L
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## **Marine**

### **Fails HR and MR**

There were only acute toxicity data for 4 different species that belonged to 2 different taxonomic groups (fish and crustacea).

Therefore, the data failed the minimum data requirements to derive a HR, MR or interim TV. Only a LR (ECL) TV could be derived.

$$\text{LR (ECL) TV} = \text{lowest value} \div \text{AF}$$



$$= 44 \div 1000$$

$$= 0.04 \mu\text{g/L}$$

However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

$$\text{LR TV} = 26.47 \div 10 = 2.647 = 2.6 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.418	2.647	5.894	13.356

These were rounded off to

0.4	3	6	13 $\mu\text{g/L}$
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## Cyanide

### Freshwater

#### Fails HR

#### MR Calculations (Cyanide expressed as unionised cyanide HCN $\mu\text{gCN/L}$ )

The data used to derive the TV were:

562.3	461.35	247.5	223.3	803.74
376.49	1229.15	992.1	1165.47	100.42
62.93	127.44	98.12	140.63	60.71
100.22	107.55	40.32	98.3	1166.74
1241.36	64078.6	62400	2153.3	821192.35
10636.2	2575.61	3322.23	18121.25	1121.54
2511.82	3011.31	486.02	488.68	532.15
448.69	4433.22	93.98	486.24	257.31
2284.90	1743.15	252.7	257.9	922.84
134.71				

HC1 50%	=	33.06
HC5 50%	=	62.30
HC10 50%	=	91.82
HC20 50%	=	155.63

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 8.45.

$$\text{MR TV} = 62.30 \div 8.45 (\text{ACR}) = 7.373 = 7 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3.9124	7.3728	10.8663	18.4178

These were rounded off to

4	7	11	18 $\mu\text{g/L}$
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**Marine  
Fails HR  
MR Calculations**

The data used to derive the TV were:

67.4	105	6708	240.7	105.9	34666.7
10424					

HC1 50%	=	16.04
HC5 50%	=	35.90
HC10 50%	=	58.77
HC20 50%	=	114.93

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 8.45.

$$\text{MR TV} = 35.90 \div 8.45 = 4.248 = 4.2 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
1.898	4.249	6.955	13.601

These were rounded off to

2	4	7	14 $\mu\text{g/L}$
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**Nitrate  
Freshwater  
Fails HR  
MR Calculations**

The data used to derive the TV were:

340406.4	896847.9	7630126	5582000
14000	5998000	5799000	720085.7
733058.5	576645.9	723490.7	9000

HC1 50%	=	167.4
HC5 50%	=	6855
HC10 50%	=	33909
HC20 50%	=	167737

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR for this chemical.

$$\text{MR TV} = 6855 \div 10 = 685.5 = 685 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
16.74	685.5	3390.9	16773.7

These were rounded off to

17	700	3400	17 000 $\mu\text{g/L}$
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## Marine Fails HR and MR

There were no chronic toxicity data and only acute data for 7 species that belonged to 2 taxonomic groups (fish and mollusca). Therefore, the data failed HR & MR methods. The best level of TV that could be derived was the LR (ECL) TV.

$$\begin{aligned} \text{LR (ECL) TV} &= 2\,536\,000 \div 200 \quad (\text{an AF of 200 was used as nitrate is an essential element}) \\ &= 12\,680 \\ &\approx 13\,000 \mu\text{g/L} \end{aligned}$$

An AF of 200 was used as nitrate is an essential element.

However, the freshwater MR TV was of higher quality and was therefore adopted as a LR (interim) TV.

$$\text{LR (interim) TV} = 685 \mu\text{g/L}$$

The other levels of protection are:

99%	95%	90%	80%
16.74	685.5	3390.9	16773.7

These were rounded off to

17	700	3400	17 000 $\mu\text{g/L}$
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## Sulfide (expressed as undissociated sulfide) Freshwater Fails HR MR Calculations

The data used to derive the TV were:

53.57	23.44	12.00	40.19	24.18	34.80	25.63
17.88	56.55	7	26.10	39.62	141.23	1072.90
45.62	160.00	487.90	363.61	363.61	2223.66	19532.13
1374.10	26.40	403.8	188.08	27690.23	6009.9	

HC1 50%	=	4.79
HC5 50%	=	9.63
HC10 50%	=	14.77
HC20 50%	=	26.45

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR for this chemical.

$$\text{MR TV (HC5 50\%)} = 9.63 \div 10 = 0.963 = 0.963 \mu\text{g/L}$$

The other levels of protection are:

99%	95%	90%	80%
0.479	0.963	1.477	2.645

These were rounded off to

0.5	1.0	1.5	2.6 $\mu\text{g/L}$
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**NOTE:** However, in order to calculate a MR TV, data that used sodium sulfide had to be included. The problem with this is that in such cases the concentrations were nominal and H<sub>2</sub>S is very volatile so the actual concentrations were probably much lower than the nominal. Therefore the toxicity data may considerably overestimate the actual concentrations that would cause the effects.

## Marine

There were no chronic toxicity data for marine species and only acute data for 5 species that belonged to 3 taxonomic groups (mollusc, echinoderm, crustaceans). Therefore only a LR (ECL) could be derived. However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{LR TV} = 9.63 \div 10 = 0.963 = 0.963 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.479	0.963	1.477	2.645

These were rounded off to

0.5	10	1.5	2.5
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## Ethyl alcohol (ethanol) [CAS No. 64-17-5]

### Freshwater

### Fails HR

### MR Calculations

The data used to derive the TV were:

4347413	9500000	15000000	13000000	13656503
880800	9273963.55	25100000	11962810	

HC1 50%	=	511202
HC5 50%	=	1759198
HC10 50%	=	2995514
HC20 50%	=	5101422

**NOTE:** Because this TV was derived using acute toxicity data it is a MRI TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (crustaceans) was 1258.71.

$$\text{MR TV} = 1759198 \div 1258.71 = 1397.62 = 1400 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
406.132	1397.620	2379.829	4052.897

These were rounded off to

400	1400	2400	4000
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**Marine  
Fails HR and MR  
LR (Interim) Calculations using QSAR derived toxicity data**

The QSAR data used to derive the TV were:

42400000	679000	1830000	2260000	2930000	3310000
1830000	35900000	4280000	759000	708000	582000
4380000	891000	383000	1110000	3400000	1420000
2000	9600				

HC1 50%	=	2445
HC5 50%	=	31192
HC10 50%	=	93708
HC20 50%	=	285475

LR (Interim) TV = 31192 ÷ 10 = 3100 µg/L

NOTE: But as this estimate of the TV was above the toxicity of the two most sensitive species (with geometric means of 2000 and 9600) the marine LR (Interim) TV was not adopted. Rather the freshwater MR TV was adopted as an LR TV.

LR TV = 1400 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
406.13	1398	2379	4052

These were rounded off to

400	1400	2400	4000 µg/L
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**Ethylene glycol [CAS No. 107-21-1]  
Freshwater  
Fails HR and MR**

There were only chronic toxicity data for 1 species (a fish) and acute toxicity data for 7 species that belonged to 3 taxonomic groups (fish, crustacea, amphibia)

Therefore only an LR (ECL) TV could be derived.

LR (ECL) TV	=	lowest value ÷ 1000
	=	326 000 µg/L ÷ 1000
	=	326 µg/L

Which was rounded up to 330 µg/L

LR (ECL) TV = 330 µg/L

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine Fails HR and MR**

There was only acute toxicity datum for 1 species, a crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 50\,000\,000 \mu\text{g/L} \div 1000 \\ &= 50\,000 \mu\text{g/L}\end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Isopropanol (Isopropyl alcohol) [CAS No. 67-63-0] Freshwater Fails HR and MR**

There were only acute toxicity data for 4 species, 2 fish, 1 insect and a protozoan.

Therefore Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 4\,200\,000 \mu\text{g/L} \div 1000 \\ &= 4200 \mu\text{g/L}\end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Marine Fails HR and MR**

There were toxicity data for only 1 marine species, a crustacean.

Therefore Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1\,150\,000 \mu\text{g/L} \div 1000 \\ &= 1150 \\ &\approx 1200 \mu\text{g/L}\end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## **Dichloromethane [CAS No. 75-09-2] Fresh and Marinewater Fails HR and MR LR (Interim) Calculations using QSAR derived toxicity data**

$$\begin{aligned}\text{HC1 50\%} &= 26715 \\ \text{HC5 50\%} &= 39319 \\ \text{HC10 50\%} &= 49810 \\ \text{HC20 50\%} &= 68725\end{aligned}$$

$$\text{LR (Interim) TV} = 39319 \div 10 = 3950 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2671.5	3931.9	4981	6872.5

These were rounded off to

3000	4000	5000	7000 µg/L
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## **Chloroform [CAS No. 67-66-3]**

### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

3400	47264.52	550000	93000	41000	1480000
61100	164000	165000	93900	24900	1550000
166000	21500	20100	25100	37100	25300
10300	28400	28800	32700		

HC1 50%	=	3677
HC5 50%	=	7749
HC10 50%	=	11474
HC20 50%	=	18609

$$\text{LR (Interim) TV (HC1 50\%)} = 3677 \div 10 = 370 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because there was a chronic toxicity value of 200 µg/L and therefore the TV was felt to not provide adequate protection.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
367.7	774.9	1147.4	1860.9

These were rounded off to

370	770	1100	1900 µg/L
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## **Carbon tetrachloride [CAS No. 56-23-5]**

### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) calculations using QSAR derived toxicity data**

The data used to derive the TV were:

377000	22200	59700	55300	53600	22000	4440
426000	44000	5050	4710	6910	3500	5520
5930	2370	6410	4290	7080		

HC1 50% = 1507  
 HC5 50% = 2383  
 HC10 50% = 3154  
 HC20 50% = 4619

LR (Interim) TV (HC5 50%) = 2383 ÷ 10 = 240 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
150.8	238.3	315.4	461.9

These were rounded off to

150	240	320	460 µg/L
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## **1,2-dichloroethane [CAS No. 107-06-2]**

### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using toxicity data derived using QSARs**

The data used to derive the TV were:

29000	11000	360000	53000	200000	3100000
104000	281000	295000	324000	206000	63900
3100000	340000	47100	43900	50300	105000
55300	22800	63600	81700	74800	

HC1 50% = 10812  
 HC5 50% = 19144  
 HC10 50% = 26420  
 HC20 50% = 40042

LR (Interim) TV (HC5 50%) = 19144 ÷ 10 = 1900 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
1081.2	1914.4	2642	4004.2

These were rounded off to

1000	1900	2600	4000 µg/L
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## **1,1,1-trichloroethane [CAS No. 71-55-6]**

### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

1: 7700	2: 130000	3: 1300	4: 621000	5: 31700	6: 85400
7: 81700	8: 81700	9: 37500	10: 8420	11: 681000	12: 71300
13: 8590	14: 8010	15: 11000	16: 11200	17: 10100	18: 4060



19: 11100	20: 8730	21: 12400
HC1 50%	= 1320	
HC5 50%	= 2680	
HC10 50%	= 3968	
HC20 50%	= 6548	

LR (Interim) TV (HC5 50%) = 2680 ÷ 10 = 270 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
132	268	396.8	654.8

These were rounded off to

130	270	400	650 µg/L
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## **1,1,2-trichloroethane [CAS No. 79-00-5]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

60000	34000	54757.85	70000	40000	57000
48438.50	81679.84	38000	55729.5	78000	47291.54
55000	55000	96000	147000	320000	170000
170000					

HC1 50%	= 29723
HC5 50%	= 35535
HC10 50%	= 39639
HC20 50%	= 45997

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 5.46.

MR TV = 35535 ÷ 5.46 (ACR) = 6508.24 = 6 500 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
5443.772894	6508.241758	7259.89011	8424.358974

These were rounded off to

5400	6500	7300	8400 µg/L
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### **Marine**

#### **HR Calculations**

The data used to derive the TV were:

3000	10000	33000	260000	200000	200000
60000					

HC1 50% = 144.62  
 HC5 50% = 1913  
 HC10 50% = 5817  
 HC20 50% = 17689

HR TV = 1913 = 1900 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
144.62	1913	5817	17689

These were rounded off to

140	1900	5800	18000 µg/L
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**1,1,2,2-tetrachloroethane [CAS No. 79-34-5]**  
**Fresh and Marine water**  
**Fails HR and MR**  
**LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

46300	57500	13300	13200	12300	16600	5100
18200	15500	6250	17100	14100	19200	944000
125000	120000	121000	1030000	108000	2144	

HC1 50% = 1995  
 HC5 50% = 3767  
 HC10 50% = 5433  
 HC20 50% = 8773

LR (Interim) TV (HC5 50%) = 3767 µg/L ÷ 10 = 376.7 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
199.469	376.714	543.273	877.284

These were rounded off to

200	400	500	900 µg/L
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**1, 1, 2, 2-pentachloroethane [CAS No. 76-01-7]**  
**Fresh and Marine water**  
**Fails HR and MR**  
**LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

237000	16400	44200	39500	36900	13400	2380
278000	28200	3070	2860	4510	1810	2730
360	1430	3820	2120	4150	10000	

HC1 50% = 347.4  
 HC5 50% = 752.1  
 HC10 50% = 1155  
 HC20 50% = 1998

LR (Interim) TV (HC5 50%) = 752.1 ÷ 10 = 75 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
34.74	75.21	115.5	199.8

These were rounded off to

30	80	120	200 µg/L
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## Hexachloroethane [CAS No. 67-72-1]

### Freshwater

### Fails HR

### MR Calculations

The data used to derive the TV were:

1372	1380	1853	1194	1116	1425	3889
4737	13000	2700	5800	2796	1964	

HC1 50% = 826.50  
 HC5 50% = 1030  
 HC10 50% = 1179  
 HC20 50% = 1417

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The fish ACR was 2.833.

MR TV (HC1 50%) = 826.50 ÷ 2.833 = 291.740 = 290 µg/L

The HC1 50% was adopted for slight to moderately modified ecosystem protection because Hexachloroethane can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
291.7402	363.685	416.205	500.081

These were rounded off to

290	360	420	500 µg/L
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**Marine  
Fails HR and MR  
LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

48900	4950	13300	10900	9410	2530	334
62400	6060	581	542	1010	234	317
682	265	694	246	722		
HC1 50%	=	102.07				
HC5 50%	=	181.11				
HC10 50%	=	257.24				
HC20 50%	=	414.73				

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 102.07 \div 10 = 10 \mu\text{g/L}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{MR TV (HC1 50\%)} = 826.50 \div 2.833 = 291.740 = 290 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because Hexachloroethane can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
291.740	363.685	416.205	500.081

These were rounded off to

290	360	415	500 $\mu\text{g/L}$
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**1,1-dichloropropane [CAS No. 78-99-9]  
Fresh and Marinewater  
Fails HR and MR  
LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

33500	42700	10100	9790	9130	12200	8310
13900	11500	4650	12700	10800	14400	699000
90000	87500	88800	755000	79600		
HC1 50%	=	3382				
HC5 50%	=	5183				
HC10 50%	=	6731				
HC20 50%	=	9605				

$$\text{LR (Interim) TV (HC5 50\%)} = 5200 \div 10 = 520 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
338.2	518.3	673.1	960.5

These were rounded off to

300	500	700	1000 µg/L
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## **1,2-dichloropropane [CAS No. 78-87-5]**

### **Fresh and Marine water**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

55300	83800	22000	19200	17900	22500
18800	32600	22500	25300	25300	29000
6000	1330000	149000	149000	156000	1390000
149000					

HC1 50%	=	5822
HC5 50%	=	9178
HC10 50%	=	12126
HC20 50%	=	17714

$$\text{LR (Interim) TV (HC5 50\%)} = 9178 \div 10 = 917.8 = 920 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
582.22	917.778	1212.552	1771.441

These were rounded off to

600	900	1200	1800 µg/L
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## **1,3-dichloropropane [CAS No. 142-28-9]**

### **Freshwater and Marine water**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

55300	83800	22000	19200	17900	22500	18800
32600	22500	9180	25300	25300	29000	1330000
149000	149000	156000	1390000	149000		

HC1 50%	=	7173.6
HC5 50%	=	10813
HC10 50%	=	13900
HC20 50%	=	19563

$$\text{LR (Interim) TV (HC5 50\%)} = 10813 \div 10 = 1100 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
717.4	1081.3	1390	1956.3

These were rounded off to

700	1100	1400	2000 µg/L
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## **Chloroethylene**

### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

165000	9560	25700	23900	23300	9690	1980
186000	19200	2220	2070	3020	1560	2480
2610	1040	2820	1930	3130		

HC1 50%	=	670.93
HC5 50%	=	1058
HC10 50%	=	1398
HC20 50%	=	2043

$$\text{LR (Interim) TV (HC5 50\%)} = 1058 \div 10 = 106 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
67.09	105.8	139.8	204.3

These were rounded off to

70	100	140	200 µg/L
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## **1,1-dichloroethylene [CAS No. 75-35-4]**

### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

891000	39200	106000	104000	108000	55600	14000
944000	101000	12700	11900	15300	11800	20200
15000	6070	16700	15700	19000		

HC1 50%	=	4627
HC5 50%	=	7016
HC10 50%	=	9052
HC20 50%	=	12804

$$\text{LR (Interim) TV (HC5 50\%)} = 7016 \div 10 = 700 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
462.7	701.6	905.2	1280.4

These were rounded off to

500	700	900	1300 µg/L
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**1, 1, 2-trichloroethylene [CAS No. 79-01-6]**  
**Fresh and Marinewater**  
**Fails HR and MR**  
**LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

488000	26200	70600	66700	6600	29100	6290
541000	56400	6670	6230	8770	5060	8200
7840	3150	8550	6370	9550		

HC1 50%	=	2168
HC5 50%	=	3272
HC10 50%	=	4210
HC20 50%	=	5933

$$\text{Interim TV (HC5 50\%)} = 3272 \div 10 = 330 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
216.8	327.2	421	593.3

These were rounded off to

220	330	400	600 µg/L
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**1, 1, 2, 2-tetrachloroethylene [CAS No. 127-18-4]**  
**Fresh and Marinewater**  
**Fails HR and MR**  
**LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

139000	10300	27800	24400	22500	7690	1290
165000	16600	1760	1640	2680	963	1420
2070	816	2180	1110	2340		

HC1 50%	=	426.6
HC5 50%	=	705.7
HC10 50%	=	960.2
HC20 50%	=	1460

$$\text{LR (Interim) TV (HC5 50\%)} = 705.7 \div 10 = 70 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
42.66	70.57	96.02	146

These were rounded off to

40	70	100	150 µg/L
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### **3-Chloropropene [CAS No. 107-05-1]**

#### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

6170000	1020000	2740000	3370000	4330000	4790000
2590000	52600000	6250000	1100000	1020000	853000
2710000	6100000	1290000	553000	1600000	4740000
2040000	3200	4100			

HC1 50%	=	5770
HC5 50%	=	63939
HC10 50%	=	180157
HC20 50%	=	507612

$$\text{LR (Interim) TV (HC5 50\%)} = 63\,939 \div 10 = 640 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
577	6393.9	18015.7	50761.2

These were rounded off to

600	6400	18000	50 000 µg/L
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However, this TV does not provide protection to a number of species with acute toxicity values of 340 and 3200 µg/L. Therefore the assessment factor method was adopted.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 340 \div 100 \\ &= 3 \mu\text{g/L (after rounding off)} \end{aligned}$$

The other levels of protection could not be calculated as the AF method was used to derive the TV.



# 1,3-dichloropropene [CAS No. 542-75-6]

## Fresh and Marine water

### Fails HR and MR

### LR (Interim) Calculations using QSAR derived toxicity data

The data used to derive the TV were:

4 120 000	134 000	359 000	380 000	421 000	275 000
88 100	4 080 000	450 000	63 100	58 900	66 200
79 400	148 000	74 100	30 600	85 500	115 000
101 000					

HC1 50%	=	26070
HC5 50%	=	38488
HC10 50%	=	48849
HC20 50%	=	67572

$$\text{LR (Interim) TV (HC5 50\%)} = 38488 \div 10 = 3850 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2607	3848.8	4884.9	6757.2

However, this TV did not provide adequate protection for some species from acute exposure (with values of 90 and 240  $\mu\text{g/L}$ ). Therefore the AF method was applied to experimental toxicity data (not QASR predicted values) to derive the LR TV.

There was only sufficient experimental toxicity data (5 species that were fish and crustaceans) to derive a LR (ECL) TV for freshwater. Similarly only a LR (ECL) TV could be derived for marine water as there was experimental toxicity data for 2 species — a fish and a crustacean.

For freshwaters

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 90 \div 1000 \\ &= 0.09 \\ &\approx 0.1 \mu\text{g/L} \end{aligned}$$

For marine waters

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 790 \div 1000 \\ &= 0.79 \\ &\approx 0.8 \mu\text{g/L} \end{aligned}$$

The other levels of protection could not be calculated as the AF method was used to derive the TV.

## Aniline [CAS No. 62-53-3]

### Freshwater HR Calculations

The data used to derive the TV were:

8667.87	15700	4	154270	94000	19000
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HC1 50%	=	0.148
HC5 50%	=	18.13
HC10 50%	=	143.58
HC20 50%	=	1137

HR TV = 18.13 = 18 µg/L

The HC5 50% figure was above chronic toxicity figures for *D. magna* and, given the small chronic database, it was preferred to use the acute data for a MR calculation.

### MR Calculations

The data used to derive the TV were:

57554	22792.67	78400	49000	37595.94	29137.20
25924.83	80241.13	68000	684.98	273.86	100
112000	155000	406003.42	175000	477900	220000
150000	94000	435138.77	235000	64000	279548.06
100000	800000	760000	450000	406000	155000
31600	68000	440000	663294.39		

HC1 50%	=	37.79
HC5 50%	=	1144
HC10 50%	=	4969
HC20 50%	=	21583

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 4.47.

MR TV (HC5 50%) =  $1144 \div 4.47 = 255.928 = 255 \mu\text{g/L}$

However, this TV was not adopted as it was considerably above the acute toxicity values for a range of crustaceans. Therefore, a more protective TV was required. There were two possibilities:

1. to use the HC5 50% but divide it by a default AF of 10 (= 110 µg/L) or
2. to use the HC1 50% with the ACR (= 4.47 µg/L)

The first method still did not provide adequate protection to the acute toxicity data — so the second method was adopted.

MR TV (HC1 50%) =  $37.79 \div 4.47 = 8.454 = 8.5 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
8.45	255.93	1111.63	4828.41

These were rounded off to

8	250	1100	4800 µg/L
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**Marine  
Fails HR and MR**

There were toxicity data for 2 species –a crustacean and a diatom.

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality than this and should therefore be adopted for marine waters.

LR TV = 8.5 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
8.45	255.93	1111.63	4828.41

These were rounded off to

8	250	1100	4800
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**2,4-dichloroaniline [CAS No. 554-00-7]**

**Freshwater**

**Fails HR**

**MR Calculations**

The data used to derive the TV were:

16 007	10 138	24 596	20 782	596	11 832	15 000
14 078	2 348	638	400	2 200		

HC1 50%	=	18.54
HC5 50%	=	220.51
HC10 50%	=	640.58
HC20 50%	=	1860.87

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (fish) was 32.18.

MR TV = 220.51 ÷ 32.18 = 6.85 = 6.9 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.576	6.852	19.906	57.827

These were rounded off to

0.6	7	20	60
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**Marine  
Fails HR and MR  
LR Calculations**

There were only toxicity data for 1 species — an alga. The highest level of TV that can be derived with the available data was a LR (ECL) TV.

LR (ECL) TV = lowest value ÷ 1000

$$= 1100 \mu\text{g/L} \div 1000$$

$$= 1.1 \mu\text{g/L}$$

However, the freshwater MR TV was of higher quality and was therefore adopted for marine waters as an LR (interim).

$$\text{LR TV} = 220.42 \div 32.18 = 6.8495 = 6.9 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.5761	6.852	19.906	57.827

These were rounded off to

0.6	7	20	60
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## **2,5-dichloroaniline [CAS No. 95-82-9]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, which belonged to 2 taxonomic groups (crustacea and algae).

Therefore only a LR (environmental concern level) TV could be derived.

$$\text{LR (ECL) TV} = \text{lowest value} \div 1000$$

$$= 2920 \mu\text{g/L} \div 1000$$

$$= 2.92 \mu\text{g/L}$$

This was rounded to 3  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 3 \mu\text{g/L}$$

### **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 3 \mu\text{g/L}$$

## **3,4-dichloroaniline [CAS No. 95-76-1]**

### **Freshwater**

#### **HR Calculations**

The data used to derive the TV were:

20	7.54	80	760	3666	2200
2700					

$$\text{HC1 50\%} = 1.337$$

$$\text{HC5 50\%} = 3.349$$

$$\text{HC10 50\%} = 5.875$$

$$\text{HC20 50\%} = 12.62$$

$$\text{HR TV} = 3.349 = 3.5 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
1.337	3.349	5.875	12.62

These were rounded off to

1.3	3	6	13 µg/L
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### **Marine Fails HR MR Calculations**

The data used to derive the TV were:

4325.31	8246.21	5468.09	2592.30	10850.28	2300
3577.71	1369	2724.65	9500	8085.65	
HC1 50%	=	868.98			
HC5 50%	=	1497			
HC10 50%	=	1934			
HC20 50%	=	2581			

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR

$$\text{MR TV} = 1497 \div 10 = 149.7 = 150 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
86.898	149.679	193.353	258.109

These were rounded off to

85	150	190	260 µg/L
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### **3,5-dichloroaniline [CAS No. 626-43-7]**

#### **Freshwater Fails HR and MR**

There were only acute toxicity data for 2 species, which belonged to 2 taxonomic groups (crustacea and alga).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1120 \mu\text{g/L} \div 1000 \\ &= 1.12 \mu\text{g/L}\end{aligned}$$

This was rounded to 1 µg/L

$$\text{LR (ECL) TV} = 1 \mu\text{g/L}$$

## Marine

There were only toxicity data for 1 marine species.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2500 \mu\text{g/L} \div 1000 \\ &= 2.5 \mu\text{g/L} \end{aligned}$$

## Benzidine

### Freshwater

There were no screened toxicity data for freshwater organisms and therefore no data for this chemical in the database. However, there was an un-screened USEPA datum of 2500  $\mu\text{g/L}$ . Therefore a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2500 \mu\text{g/L} \div 1000 \\ &= 2.5 \mu\text{g/L} \end{aligned}$$

## Marine

There were no toxicity data for marine organisms. Therefore the freshwater TV was adopted for marine waters.

$$\text{LR TV} = 2.5 \mu\text{g/L}$$

## Dichlorobenzidine

### Freshwater

There were no screened toxicity data for freshwater organisms, and therefore no data in the database. There is however, an unscreened USEPA datum of 500  $\mu\text{g/L}$ . Therefore a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 500 \mu\text{g/L} \div 1000 \\ &= 0.5 \mu\text{g/L} \end{aligned}$$

## Marine

There were no toxicity data for marine organisms. Therefore the freshwater TV was adopted for marine waters.

$$\text{LR TV} = 0.5 \mu\text{g/L}$$

## Benzene [CAS No. 71-43-2]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

91446.25	370000	13500	21800	425000	33713.34
31714.09	19865.74	36900.51	12836.78	6786.75	10300
28396.49	8437.14	12900	47766.97	51299.89	

405270.56	111101.2	710000	63268.69	42000	200000
1370000	100000	34000	48000	71000	10000
130000	97274.67	117934.64	970000	34000	74000
29000	370000	190000			

HC1 50%	=	5838
HC5 50%	=	9554
HC10 50%	=	12914
HC20 50%	=	19463

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The fish ACR for benzene was 1.97 — this was the only ACR and therefore was adopted.

$$\text{MR TV} = 9554 \div 1.97 = 4849.746 = 4850 \mu\text{g/L}$$

However, this TV did not provide adequate protection for the most sensitive acute value of 4600  $\mu\text{g/L}$ . Therefore the default AF of 10 was used rather than the ACR.

$$\text{MR TV} = 9554 \div 10 = 955.4$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
583.8	955.4	1291.4	1946.3

These were rounded off to

600	950	1300	2000 $\mu\text{g/L}$
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## **Marine Fails HR MR Calculations**

The data used to derive the TV were:

14142.14	11000	8115.65	22000	40000	88572.03
21000	95247.05	20000	33000	7878.60	924000
196568.55	165000	14832.40			

HC1 50%	=	4740
HC5 50%	=	7192
HC10 50%	=	9282
HC20 50%	=	13136

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The fish ACR for benzene was 1.97 — this was the only ACR and therefore was adopted.

$$\text{MR TV} = 7192 \div 1.97 = 3650.76 = 3650 \mu\text{g/L}$$

However, this TV did not provide adequate protection for the most sensitive chronic value (an Australian species). Therefore the default AF of 10 was used rather than the ACR.

$$\text{MR TV} = 7192 \div 10 = 719.2 \mu\text{g/L}$$

This still did not provide adequate protection so the HC1 50% and the default AF were used to derive the TV.

$$\text{Therefore MR TV} = 4740 \div 10 = 474 = 500 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
474.0	719.2	928.2	1313.6

These were rounded off to

500	700	900	1300 $\mu\text{g/L}$
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## **Toluene [CS No. 108-88-3]**

### **Fresh and Marine water**

#### **Fails HR & MR**

#### **LR (Interim) Calculations using QSAR derived chronic toxicity data**

The data used to derive the TV were:

273000	15400	41400	38700	37900	16100
3340	305000	31600	3690	3440	4950
2660	4250	4330	1730	4700	3300
5220	3200				

HC1 50%	=	1139
HC5 50%	=	1762
HC10 50%	=	2302
HC20 50%	=	3312

$$\text{LR (Interim) TV (HC5 50\%)} = 1762 \div 10 = 175 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
113.9	176.2	230.2	331.2

These were rounded off to

110	180	230	330 $\mu\text{g/L}$
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## **Ethylbenzene [CAS No. 100-41-4]**

### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

1000	9550	8070	1850	1730	2690
1120	1710	2170	862	2310	1330
2520	142000	25700	23100	6142	166000
16800	17000				

HC1 50%	=	488.96
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HC5 50% = 790.88  
 HC10 50% = 1061  
 HC20 50% = 1584

LR (Interim) TV (HC5 50%) =  $790.88 \div 10$  = 80 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
48.896	79.088	106.1	158.4

These were rounded off to

50	80	110	160 µg/L
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## **o-xylene [CAS No. 95-47-6]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

16 100	16 100	16 100	7 821.76	16 299.38
12 000	3 488.08	4 700	73 000	

HC1 50% = 1995  
 HC5 50% = 3533  
 HC10 50% = 4665  
 HC20 50% = 6440

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

MR TV =  $3533 \div 10$  = 353.3 = 355 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
199.5	353.3	466.5	644

These were rounded off to

200	350	470	640 µg/L
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### **Marine**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

291 000	16 700	45 000	41 900	40 900	17 100	3 520
328 000	33 900	3 920	3 660	5 310	2 790	4 430
4 610	1 850	4 990	3 440	5 530		

HC1 50%	=	1196
HC5 50%	=	1882
HC10 50%	=	2484
HC20 50%	=	3625

$$\text{LR (Interim) TV (HC5 50\%)} = 1882 \div 10 = 190 \mu\text{g/L}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{MR TV} = 3533 \div 10 = 353.3 = 355 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
199.5	353.3	466.5	644

These were rounded off to

200	350	470	640 $\mu\text{g/L}$
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## **m-xylene [CAS No. 108-38-3]**

### **Fresh and Marine water**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

129000	8870	23900	21400	20000	7310
4900	151000	15300	1670	1560	2450
995	1510	1970	780	2090	1170
2270					

HC1 50%	=	467.16
HC5 50%	=	762.89
HC10 50%	=	1029.95
HC20 50%	=	1549.62

$$\text{LR (Interim) TV (HC5 50\%)} = 762.89 \div 10 = 76 = 75 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
46.716	76.289	102.995	154.962

These were rounded off to

50	75	100	150 $\mu\text{g/L}$
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## ***p*-xylene [CAS No. 106-42-3]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

2600	8800	8494	3200	88100
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HC1 50% = 1352

HC5 50% = 1964

HC10 50% = 2468

HC20 50% = 3368

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

MR TV =  $1964 \div 10 = 196.4 = 196 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
135.2	196.4	246.8	336.8

These were rounded off to

140	200	250	340 $\mu\text{g/L}$
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### **Marine**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

142 000	9 550	25 700	23 100	21 800	8 070	1 470
166 000	16 800	1 850	1 730	2 690	1 120	1 710
2 170	862	2310	1 330	2 520		

HC1 50% = 493.79

HC5 50% = 799.74

HC10 50% = 1074

HC20 50% = 1605

LR (Interim) TV (HC5 50%) =  $799.74 \div 10 = 80 \mu\text{g/L}$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

LR TV =  $1964 \div 10 = 196.4 = 196 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
135.2	196.4	246.8	336.8

These were rounded off to

140	200	250	340 µg/L
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## **Isopropylbenzene (Cumene, 2-phenyl-propane) [CAS No. 98-82-8]**

### **Freshwater and Marinewater**

**Fails HR and MR**

**LR (Interim) Calculations based on QSAR derived toxicity data**

The data used to derive the TV were:

61500	5100	13700	11800	10600	3330	2600
75000	7450	763	712	1220	375	538
896	351	931	417	991		

HC1 50%	=	178.9
HC5 50%	=	304.6
HC10 50%	=	422.0
HC20 50%	=	657.5

$$\text{LR (Interim) TV (HC5 50\%)} = 305 \div 10 = 30 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
17.89	30.46	42.2	65.75

These were rounded off to

20	30	40	70 µg/L
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## **Naphthalene [CAS No. 91-20-3]**

### **Freshwater**

**Fails HR**

**MR Calculations**

The data used to derive the TV were:

27	33000	5010	7464	2570	13000	2800
14450	3930	67800	2600	2113	5052	

**NOTE:** This contains data greater than the aqueous solubility (Aq sol x 2 = 60 000). Data above the aqueous solubility were removed and recalculated below.

680	2421.58	2223.25	4788.49	2200	1843.91
3930	27	2800	14059.13	5009.99	33000

$$\text{HC1 50\%} = 24.66$$

HC5 50%	=	162.40
HC10 50%	=	370.16
HC20 50%	=	854.09

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 162.40 \div 10 = 16.24 = 16 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2.466	16.24	37.02	85.41

These were rounded off to

2.5	16	37	85 $\mu\text{g/L}$
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## **Marine Fails HR MR Calculations**

The data used to derive the TV were:

5300	750	1124.89	17736.91	1400
2336.77	700	1390	5087.4	1047.12
62833.02	3800			

**NOTE:** The above contains data greater than twice the aqueous solubility (ie. 60 000  $\mu\text{g/L}$ ). Data above the aqueous solubility were removed and recalculated below.

5300	750	1124.89	17736.91	1400
2336.78	2700	1390	5087.40	1047.12
57000	3800			

HC1 50%	=	500.25
HC5 50%	=	724.74
HC10 50%	=	909.32
HC20 50%	=	1238.26

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV (HC1 50\%)} = 500.25 \div 10 = 50.025 = 50.03 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the TV did not provide adequate protection (a chronic crab value was below the TV).

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
50.025	72.474	90.932	123.826

These were rounded off to

50	70	90	120 µg/L
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## **Anthracene [CAS No. 120-12-7]**

### **Fresh and Marinewater**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

0.63	2.94	20500	2360	6350	5070
4240	1030	26900	2580	237	221
436	110	278	107	279	85.2
286					

HC1 50%	=	0.126
HC5 50%	=	3.622
HC10 50%	=	15.55
HC20 50%	=	68.71

NOTE: This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 0.126 \div 10 = 0.013 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because anthracene can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.01256	0.3622	1.5545	6.871

These were rounded off to

0.01	0.4	1.5	7 µg/L
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## **Phenanthrene [CAS No. 85-01-8]**

### **Fresh and Marine water**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

42.33	32	60	150	120	232
216	429	107	272	105	273
83.1	280	20100	2330	6260	4990
4170	1010	26400	2530		

HC1 50%	=	19.88
HC5 50%	=	38.21
HC10 50%	=	56.99
HC20 50%	=	98.20

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 19.88 \div 10 = 1.99\mu\text{g/L}$$

**NOTE:** The data above contains data greater the aqueous solubility cut-off (2 x aq. sol.) was 1632. It was recalculated using this reduced database below.

42.33	32	60	150	120	232	216
429	107	272	105	273	83.1	280

HC1 50%	=	5.73
HC5 50%	=	22.94
HC10 50%	=	41.70
HC20 50%	=	75.79

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value is used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 5.73 \div 10 = 0.6 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.573	2.294	4.17	7.579

These were rounded off to

0.6	2	4	8 $\mu\text{g/L}$
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## **Fluoranthene [CAS No. 206-44-0]**

### **Fresh and Marine water**

#### **Fails Level HR and MR**

#### **LR (Interim) Calculations using QSAR derived chronic toxicity data**

The data used to derive the TV were:

12.32	90	18	30	940	2530
1890	2530	287	27.2	789	65.7
61.3	138	20.9	77.2	29.3	74.4
74.9	16.3	6080	8520		

**NOTE:** The data included toxicity data greater than twice the aqueous solubility. These data were removed and the TV recalculated below.

12.32	90	18	30	287	27.2
65.7	61.3	138	20.9	77.2	29.3
74.9	16.3	74.4			

HC1 50%	=	10.01
HC5 50%	=	13.75
HC10 50%	=	16.70

$$\text{HC20 50\%} = 21.75$$

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 10.01 \div 10 = 1 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
1.001	1.375	1.67	2.175

These were rounded off to

1	1.4	1.7	2 $\mu\text{g/L}$
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## **Benzo[a]pyrene [CAS No. 50-32-8]**

### **Fresh and Marine water**

#### **Fails HR and MR**

#### **LR (Interim) calculations using QSAR derived toxicity data**

The data used to derive the TV were:

1650	356	957	664	483	72.1	10.4
2480	222	16.5	15.4	40.3	3.11	3.42
19.4	7.21	18.1	2.66	17.3	6.3	5.00

HC1 50%	=	1.18
HC5 50%	=	2.44
HC10 50%	=	3.82
HC20 50%	=	7.02

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 1.18 \div 10 = 0.1 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.118	0.244	0.382	0.702

These were rounded off to

0.1	0.2	0.4	0.7 $\mu\text{g/L}$
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## **Nitrobenzene [CAS No. 98-95-3]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

6000	43000	106359.05	29849.62	18000	22234.80
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142800

HC1 50% = 2662  
HC5 50% = 6314  
HC10 50% = 9431  
HC20 50% = 14749

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (crustaceans) was 11.48.

MR TV =  $6314 \div 11.48 = 550 = 550 \mu\text{g/L}$

The other levels of protection are:

99%	95%	90%	80%
231.8815331	550	821.5156794	1284.756098

These were rounded off to

230	550	820	1300 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were only acute toxicity data for 2 species which belonged to 2 taxonomic group2 (fish and alga).

Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV = lowest value  $\div$  1000  
=  $10\ 300 \mu\text{g/L} \div 1000$   
=  $10.3 \mu\text{g/L}$

However, the MR TV for freshwater could be adopted as a LR TV.

LR TV =  $6314 \div 11.48 = 550 = 550 \mu\text{g/L}$

The other levels of protection are:

99%	95%	90%	80%
231.8815331	550	821.5156794	1284.756098

These were rounded off to

230	550	820	1300
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## **1,2-dinitrobenzene [CAS No. 528-29-0] Freshwater Fails HR and MR**

There were only acute toxicity data for 2 species, a fish and a protozoan.

ThereforeOnly a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 600 \mu\text{g/L} \div 1000 \\
 &= 0.6 \mu\text{g/L}
 \end{aligned}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted as the LR TV for marine waters.

$$\text{Therefore LR (ECL) TV} = 0.6 \mu\text{g/L}$$

## 1,3-dinitrobenzene [CAS No. 99-65-0]

### Freshwater

#### Fails HR and MR

There were only chronic data for 3 species which belonged to 3 taxonomic groups (fish, crustacea and alga). Therefore a LR (interim) TV could be derived using chronic data.

There were only acute toxicity data for 6 species which belonged to 3 taxonomic groups (fish, crustacea and alga). Therefore a LR (interim) TV could be derived using acute data.

$$\begin{aligned}
 \text{LR (interim) TV} &= \text{lowest value} \div 20 \\
 &= 260 \div 20 \\
 &= 13 \mu\text{g/L}
 \end{aligned}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR TV was adopted for marine waters.

$$\text{LR TV} = 13 \mu\text{g/L}$$

## 1,4-dinitrobenzene (p dinitrobenzene) [CAS No. 100-25-4]

### Freshwater

#### Fails HR and MR

There were only acute toxicity data for 4 species, which belonged to 3 taxonomic group.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 603 \mu\text{g/L} \div 1000 \\
 &= 0.603 \mu\text{g/L}
 \end{aligned}$$

This was rounded to 0.6  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 0.6 \mu\text{g/L}$$

## Marine

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{ECL} = 0.6 \mu\text{g/L}$$

## **1,3,5-trinitrobenzene**

### **Freshwater**

#### **Fails HR and MR**

There were only chronic data for 3 species which belonged to 3 taxonomic groups (fish, crustacea and alga). Therefore a LR (interim) TV could be derived using chronic data.

There were only acute toxicity data for 6 species which belonged to 3 taxonomic groups (fish, crustacea and alga). Therefore a LR (interim) TV could be derived using acute data.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 20 \\ &= 80 \div 20 \\ &= 4 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 4 \mu\text{g/L}$$

## **1-methoxy-2-nitrobenzene [CAS No. 91-23-6]**

### **Freshwater**

#### **Fails HR and MR**

There were only chronic toxicity data for 1 species, a crustacean. There were only acute toxicity data for 2 species, a fish and a green alga. By combining the data there were values for a fish, a crustacean and green alga.

Therefore Only a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (Interim) TV} &= \text{lowest value} \div 100 \\ &= 13,000 \mu\text{g/L} \div 100 \\ &= 130 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater interim WQG was adopted as the LR TV for marine waters.

$$\text{Therefore LR TV} = 130 \mu\text{g/L}$$

## **1-methoxy-4 nitrobenzene [CAS No. 100-17-4]**

### **Freshwater**

#### **Fails HR and MR**

There were only toxicity data for 2 species, 1 green alga and 1 crustacean.

Therefore Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div \text{AF} \\ &= 3200 \mu\text{g/L} \div 200 \\ &= 16 \mu\text{g/L}\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR TV was adopted as the LR TV for marine waters.

Therefore LR TV = 16 µg/L

## 1-chloro-2-nitrobenzene [CAS No. 88-73-3]

### Freshwater

#### Fails HR and MR

There were chronic toxicity data for 1 species, a crustacean. There were acute toxicity data for 2 species, a crustacean and an alga

Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV = lowest value ÷ 1000  
= 3000 µg/L ÷ 200  
= 15 µg/L

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) was adopted for marine waters.

ECL = 15 µg/L

## 1-chloro-3-nitrobenzene [CAS No. 121-73-3]

### Freshwater

#### Fails HR and MR

There were chronic toxicity data for 1 species — a green alga. There were acute toxicity data for 3 species that belonged to 2 taxonomic groups (fish and crustacea). By combining the data there were data for 4 species that belonged to 3 taxonomic groups (alga, crustacea and fish). Therefore a LR (interim) TV could be derived.

LR (interim) TV = lowest value ÷ 100  
= 1200 ÷ 100  
= 12 µg/L

## Marine

### Fails HR and MR

There were no toxicity data for marine species. Therefore the freshwater LR TV was adopted for marine waters.

LR TV = 12 µg/L

## **1-chloro-4-nitrobenzene [CAS No. 100-00-5]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, which belonged to 2 taxonomic groups — an crustacean and an alga. There was a chronic toxicity value for a crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest chronic value} \div 200 \\ &= 190 \div 200 \\ &= 0.95 \\ &\approx 1 \mu\text{g/L}\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

### **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR TV} = 1 \mu\text{g/L}$$

## **1-chloro-2,4-dinitrobenzene [CAS No. 97-00-7]**

### **Freshwater**

#### **Fails HR and MR**

There were only toxicity data for 2 species, 1 crustacean and 1 alga.

Therefore Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 800 \mu\text{g/L} \div 200 \\ &= 4 \mu\text{g/L}\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR TV was adopted as the LR TV for marine waters.

$$\text{Therefore LR TV} = 4 \mu\text{g/L}$$

## **1,2-dichloro-3-nitrobenzene [CAS No. 3209-22-1]**

### **Freshwater**

#### **Fails HR and MR**

There were only toxicity data for 2 species, 1 crustacean and 1 alga.

Therefore Only a LR (ECL) could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 2900 \mu\text{g/L} \div 200 \\ &= 14.5 \mu\text{g/L} \\ &\approx 15 \mu\text{g/L}\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR TV was adopted as the LR TV for marine waters.

Therefore LR TV = 15 µg/L

## **1,3-dichloro-5-nitrobenzene [CAS No. 618-62-2]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, which belonged to 2 taxonomic groups (crustacea and a green algae).

Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV = lowest value ÷ 200  
= 600 µg/L ÷ 200  
= 3 µg/L

An AF of 200 was used as the lowest toxicity value was chronic.

## **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

ECL = 3 µg/L

## **1,4-dichloro-2-nitrobenzene [CAS No. 89-61-2]**

### **Freshwater**

#### **Fails HR and MR**

There were only toxicity data for 2 species, which belonged to 2 taxonomic groups (crustacea and green algae).

Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV = lowest value ÷ 200  
= 2100 µg/L ÷ 200  
= 10 µg/L

An AF of 200 was used as the lowest toxicity value was chronic.

## **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

LR TV = 10 µg/L

## **2,4-dichloro-2-nitrobenzene [CAS No. 611-06-3]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, which belonged to 2 taxonomic groups (crustacea and green algae).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 2400 \mu\text{g/L} \div 200 \\ &= 12 \mu\text{g/L}\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

### **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{ECL} = 12 \mu\text{g/L}$$

## **1, 2, 4, 5-tetrachloro-3-nitrobenzene [CAS No. 117-18-0]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 6 species, 3 fish, 2 crustaceans and 1 mollusc.

Therefore only a LR (environmental concern level) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 270 \mu\text{g/L} \div 1000 \\ &= 0.27 \mu\text{g/L} \\ &\approx 0.3 \mu\text{g/L}\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR TV was adopted as the LR TV for marine waters.

$$\text{Therefore LR TV} = 0.3 \mu\text{g/L}$$

## **1,5-dichloro-2,4-dinitrobenzene [3698-83-7]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 5 species of fish

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 26 \mu\text{g/L} \div 1000 \\ &= 0.026 \mu\text{g/L}\end{aligned}$$

Which was rounded up to 0.03 µg/L

$$\text{LR (ECL) TV} = 0.03 \text{ } \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.03 \text{ } \mu\text{g/L}$$

## **,3,5-trichloro-2,4-dinitrobenzene**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic toxicity data. There were only acute toxicity data for 1 species — a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 222 \text{ } \mu\text{g/L} \div 1000 \\ &= 0.222 \text{ } \mu\text{g/L} \end{aligned}$$

Which was rounded up to 0.2 µg/L

$$\text{LR (ECL) TV} = 0.2 \text{ } \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.2 \text{ } \mu\text{g/L}$$

## **1-fluoro-4-nitrobenzene [CAS No. 350-46-9]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species, a fish.

Therefore Only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 28400 \text{ } \mu\text{g/L} \div 1000 \\ &= 28.4 \text{ } \mu\text{g/L} \\ &\approx 28 \text{ } \mu\text{g/L} \end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR TV was adopted as the LR TV for marine waters.

$$\text{Therefore LR TV} = 28 \text{ } \mu\text{g/L}$$



## **2-nitrotoluene (1-methyl-2-nitrobenzene) [CAS No. 88-72-2]**

### **Freshwater**

#### **Fails HR and MR**

There were only toxicity data for 3 species, 1 fish (acute), 1 crustacean (acute) and 1 alga (chronic).

Therefore Only a LR (Interim) TV could be derived.

$$\begin{aligned} \text{LR (Interim) TV} &= \text{lowest value} \div 100 \\ &= 11\,000 \mu\text{g/L} \div 100 \\ &= 110 \mu\text{g/L} \end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (interim)TV was adopted as the LR TV for marine waters.

$$\text{Therefore LR TV} = 110 \mu\text{g/L}$$

## **3-nitrotoluene (1-methyl-3-nitrobenzene) [CAS No. 99-08-1]**

### **Freshwater**

#### **Fails HR and MR**

There were only toxicity data for 3 species, 1 fish (acute), 1 crustacean (acute) and 1 alga (chronic).

Therefore Only a LR (Interim) TV could be derived.

$$\begin{aligned} \text{LR (Interim) TV} &= \text{lowest value} \div 100 \\ &= 7500 \mu\text{g/L} \div 100 \\ &= 75 \mu\text{g/L} \end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (interim) TV was adopted as the LR TV for marine waters.

$$\text{Therefore LR TV} = 75 \mu\text{g/L}$$

## **4-nitrotoluene (1-methyl-4-nitrobenzene) [CAS No. 99-99-0]**

### **Freshwater**

#### **Fails HR and MR**

There were only toxicity data for 3 species, 1 fish (acute), 1 crustacean (acute) and 1 alga (chronic).

Therefore Only a LR (Interim) TV could be derived.

$$\begin{aligned} \text{LR (Interim) TV} &= \text{lowest value} \div 100 \\ &= 12\,100 \mu\text{g/L} \div 100 \\ &= 121 \mu\text{g/L} \\ &= 120 \mu\text{g/L} \end{aligned}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (interim) TV was adopted as the LR TV for marine waters.

Therefore ECL = 120 µg/L

## 2,3-dinitrotoluene [CAS No. 602-01-7]

### Freshwater

#### Fails HR and MR

There were no chronic toxicity data. There was only acute toxicity data for 3 species that belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV = lowest value ÷ 1000  
= 330 µg/L ÷ 1000  
= 0.33 µg/L

## Marine

There were no chronic toxicity data. There was only acute toxicity data for 2 species that belonged to 2 taxonomic groups (fish, and crustacea).

Therefore the freshwater LR (ECL) TV was adopted for marine waters.

Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV = lowest value ÷ 1000  
= 400 µg/L ÷ 1000  
= 0.4 µg/L

## 2,4-dinitrotoluene [CAS No. 121-14-2]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

17663	6562	23452	33000	31553	9600	1900
6200	1833	3000	1600	3800	255	1006

HC1 50%	=	103.9
HC5 50%	=	426.24
HC10 50%	=	802.2
HC20 50%	=	1581

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The fish ACR was 6.33.

MR TV (HC1 50%) = 103.9 ÷ 6.33 (ACR) = 16.41 = 16 µg/L

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the HC5 50% figure did not provide adequate protection to chronic toxicity data.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
16.42338073	67.33649289	126.7298578	249.7630332

These were rounded off to

16	65	130	250 µg/L
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## Marine

There is no toxicity data for marine species. Therefore the freshwater MR TV was adopted for marinewaters.

$$\text{LR TV (HC1 50\%)} = 16 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
16.42338073	67.33649289	126.7298578	249.7630332

These were rounded off to

16	65	130	250 µg/L
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## 2,6-dinitrotoluene [CAS No. 606-20-2]

### Freshwater

#### Fails HR and MR

There were chronic toxicity data for 2 species that belonged to 2 taxonomic groups (crustacean and algae).

∴ Only a LR (ECL) TV could be derived.

An AF of 200 was used because of chronic data (limited)

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 60 \mu\text{g/L} \div 200 \\ &= 0.3 \mu\text{g/L}\end{aligned}$$

## Marine

There were no chronic or acute toxicity data.

Therefore the freshwater LR (ECL) TV was adopted for marine waters.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 60 \mu\text{g/L} \div 200 \\ &= 0.3 \mu\text{g/L}\end{aligned}$$

## **2,4,6-trinitrotoluene (2-methyl-1, 3, 5-trinitrobenzene) [CAS No. 118-96-7]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

2400	2486.79	1200	2190.82	4451.15	6500
24800	4900	9100	3346.37		

HC1 50%	=	1004
HC5 50%	=	1371
HC10 50%	=	1648
HC20 50%	=	2107

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

MR TV =  $1371 \div 10 = 137.1 = 140 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
100.4	137.1	164.8	210.7

These were rounded off to

100	140	160	210 $\mu\text{g/L}$
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### **Marine**

There were no toxicity data for marine species. Therefore the freshwater MR TV was adopted for marine waters.

LR TV = 140  $\mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
100.4	137.1	164.8	210.7

These were rounded off to

100	140	160	210 $\mu\text{g/L}$
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## **1,2-dimethyl-3-nitrobenzene [CAS No. 83-41-0]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species — a crustacean.

Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV = lowest value  $\div 1000$

$$\begin{aligned} &= 4200 \mu\text{g/L} \div 1000 \\ &= 4.2 \mu\text{g/L} \end{aligned}$$

This was rounded to 4  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 4 \mu\text{g/L}$$

### **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV adopted for marine waters.

$$\text{LR TV} = 4 \mu\text{g/L}$$

## **1,2-dimethyl-4-nitrobenzene [CAS No. 99-51-4]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species — a crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 16\,000 \mu\text{g/L} \div 1000 \\ &= 16 \mu\text{g/L} \end{aligned}$$

### **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR TV} = 16 \mu\text{g/L}$$

## **4-chloro-3-nitrotoluene (1-chloro-4-methyl-2-nitrobenzene) [CAS No. 89-60-1]**

### **Freshwater**

#### **Fails HR and MR**

There were only chronic toxicity data for 1 species, (a crustacea) and acute toxicity data for 1 species (an alga).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL)} &= \text{lowest value} \div 200 \\ &= 300 \mu\text{g/L} \div 200 \\ &= 1.5 \mu\text{g/L} \end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 1.5 \mu\text{g/L}$$

## Chlorobenzene [CAS No. 108-90-7]

### Fresh and Marine water

#### Fails HR and MR

#### LR (Interim) Calculations using QSAR derived toxicity data

The data used to derive the TV were:

4800	2900	3890	320	43588.99	246000
14900	40000	36800	14300	20 310	280000
28800	3280	3060	4540	3480	3850
1540	4150	2700	4570	253.4	

HC1 50%	=	165.61
HC5 50%	=	544.99
HC10 50%	=	970.09
HC20 50%	=	1888.89

$$\text{LR (Interim) TV (HC5 50\%)} = 544.99 \div 10 = 54.49 = 54 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
16.561	54.499	97.009	188.889

These were rounded off to

15	55	100	190 $\mu\text{g/L}$
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## 1,2-dichlorobenzene [CAS No. 95-50-1]

### Freshwater

#### Fails HR

#### MR Calculations

There were chronic toxicity data for 4 species which belonged to 3 taxonomic groups (fish, crustacea and green algae). There were acute toxicity data for 7 species which belonged to 3 taxonomic groups (fish, crustaceans and insects). In this case the toxicity data for the green algae were combined with the acute toxicity data to derive a MR TV using the statistical extrapolation method. The data used to derive the TV were:

6800	9460.48	2294.85	34777.92	4793
1761.14	12000	13500	2200	

HC1 50%	=	1160
HC5 50%	=	1641
HC10 50%	=	2029
HC20 50%	=	2710

**NOTE:** Because this TV is derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There is no ACR.

$$\text{MR TV (HC5 50\%)} = 1641 \div 10 = 164.1 = 164 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
116	164.1	203	271

These were rounded off to

120 160 200 270 µg/L

## Marine

### Fails HR and MR

#### LR (Interim) Calculations using QSAR derived toxicity data

388.99	5000	7600	7600	7600	7600
116000	8750	23600	20700	19000	13 500
2200	139000	13900	1470	1370	2250
1170	1730	681	1820	909	1950
1540					

HC1 50%	=	365.6
HC5 50%	=	620.2
HC10 50%	=	857.0
HC20 50%	=	1331

$$\text{LR (Interim) TV (HC5 50\%)} = 620.2 \div 10 = 62 = 60 \mu\text{g/L}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{Therefore LR TV} = 164 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
116	164.1	203	271

These were rounded off to

120 160 200 270 µg/L

## 1,3-dichlorobenzene [CAS No. 541-73-1]

### Freshwater

#### Fails HR

#### MR Calculations

5000	8044.62	2244.99	30000	114000
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HC1 50%	=	1179
HC5 50%	=	1905
HC10 50%	=	2555
HC20 50%	=	3810

**NOTE:** Because this TV is derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 7.35.

$$\text{MR TV (HC5 50\%)} = 1905 \div 7.35 = 259.18 = 260 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
160.4081633	259.1836735	347.6190476	518.3673469

These were rounded off to

160 260 350 520 µg/L

## **Marine**

### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

1000	454.97	846	1210	1130	1880
911	1420	1480	707	1590	96100
7550	20300	17700	19000	116000	11600
11400					

HC1 50%	=	272.78
HC5 50%	=	464.79
HC10 50%	=	644.03
HC20 50%	=	1003.87

$$\text{LR (Interim) TV (HC5 50\%)} = 464.79 \div 10 = 46.48 = 46 \mu\text{g/L}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{LR TV (HC5 50\%)} = 1905 \div 7.35 = 259.18 = 260 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
160.4081633	259.1836735	347.6190476	518.3673469

These were rounded off to

160 260 350 520 µg/L

## **1,4-dichlorobenzene [CAS No. 106-46-7]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

4250	2512.38	4300	1178.98	8226.14	2896
700	1200	13000	28000		

HC1 50%	=	510.5
HC5 50%	=	764.2
HC10 50%	=	978.2
HC20 50%	=	1369



**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 13.26.

$$\text{MR TV (HC5 50\%)} = 764.2 \div 13.26 = 57.63 = 60\mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
38.5	57.63198	73.77225	103.2338

These were rounded off to

40      60      75      100 µg/L

## **Marine**

### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

114000	8620	23200	20300	18600	6290	570
136000	13700	1440	1350	2210	297.76	1140
1690	320	1780	887	1910	650	31

HC1 50%	=	29.86
HC5 50%	=	125.76
HC10 50%	=	251.44
HC20 50%	=	558.2

$$\text{LR (Interim) TV (HC5 50\%)} = 125.76 \div 10 = 12.5 \mu\text{g/L}$$

However, the freshwater TV was of higher quality than this and should therefore be adopted for marine waters.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
38.5	57.63198	73.77225	103.2338

These were rounded off to

40      60      75      100 µg/L

## **1,2,3-trichlorobenzene [CAS No. 87-61-6]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

3100	710	279.1	1601.97	1700	900
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HC1 50%	=	69.42
HC5 50%	=	222.13
HC10 50%	=	366.73
HC20 50%	=	607.2

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (crustaceans) was 22.44.

$$\text{MR TV (HC1 50\%)} = 69.42 \div 22.44 = 3.0936 = 3.1 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because 1,2,3-trichlorobenzene can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3.093582888	9.898841355	16.34135472	27.05882353

These were rounded off to

3      10      16      30  $\mu\text{g/L}$

## Marine

### Fails HR and MR

### LR (Interim) Calculation using QSAR derived toxicity data

The data used to derive the TV were:

250	34.64	110	25	3790	10200
8390	7210	1940	4640	445	415
775	243	523	532	189	553

HC1 50%	=	9.88
HC5 50%	=	38.94
HC10 50%	=	74.66
HC20 50%	=	156.48

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 9.88 \div 10 = 0.988 = 1 \mu\text{g/L}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{Therefore LR TV} = 3.1 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3.093582888	9.898841355	16.34135472	27.05882353

These were rounded off to

3      10      16      30  $\mu\text{g/L}$

# 1,2,4-trichlorobenzene [CAS No. 120-82-1]

## Freshwater

### Fails HR

#### MR Calculations

The data used to derive the TV were:

1100	6300	1748.44	3268.30	2072.86	2868.15
2668.15	3020	930	3160		

HC1 50%	=	456.3
HC5 50%	=	892.4
HC10 50%	=	1193
HC20 50%	=	1606

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 5.32.

$$\text{MR TV (HC1 50\%)} = 456.3 \div 5.32 = 85.77 = 85 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because 1,2,4-trichlorobenzene can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
85.778	167.735	224.320	301.805

These were rounded off to

85	170	220	300 $\mu\text{g/L}$
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## Marine

### Fails HR

#### MR Calculations

The data used to derive the TV were:

6000	5095.5	1100	2600	540
890	930	8750	2990	3650
2600	3320			

HC1 50%	=	117.89
HC5 50%	=	424.0
HC10 50%	=	736.2
HC20 50%	=	1282

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 5.32.

$$\text{MR TV (HC1 50\%)} = 117.89 \div 5.32 = 22.16 = 22 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
22.15977444	79.69924812	138.3834586	240.9774436

These were rounded off to

20      80      140      240 µg/L

**1,3,5-trichlorobenzene [CAS No. 108-70-3]**  
**Fresh and Marinewater**  
**Fails HR and MR**  
**LR (Interim) Calculation using QSAR derived toxicity data**

The data used to derive the TV were:

1000	34100	3520	9490	7750	6640	1760	228
43700	4230	403	376	709	159	215	474
183	480	167	499				

HC1 50%	=	73.7
HC5 50%	=	129.6
HC10 50%	=	183.1
HC20 50%	=	293.0

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) (HC1 50\%) TV} = 73.7 \div 10 = 7.5 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
7.37	12.96	18.31	29.3

These were rounded off to

8      13      20      30 µg/L

**1, 2, 3, 4-tetrachlorobenzene [CAS No. 634-66-2]**  
**Fresh and Marine water**  
**Fails HR and MR**  
**LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

100	23.45	859	96.4	197	184
376	82.5	231	250	230	64.1
233	2160	5820	4560	3750	2200

HC1 50%	=	20.57
HC5 50%	=	39.74

HC10 50% = 58.16  
 HC20 50% = 95.91

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

LR (Interim) TV (HC1 50%) =  $20.57 \div 10 = 2.06 \mu\text{g/L}$

The other levels of protection are:

99%	95%	90%	80%
2.057	3.974	5.816	9.591

These were rounded off to

2      4      6      10  $\mu\text{g/L}$

## **1,2,3,5-tetrachlorobenzene [CAS No. 634-90-2]**

### **Fresh and Marine water**

#### **Fails HR and MR**

#### **LR (Interim) Calculations using QSAR derived toxicity data**

The data used to derive the TV were:

825	92.1	189	176	363	61.4	78.5
222	85.1	221	60.9	224	2100	4420
3620	2120					

HC1 50% = 31.46  
 HC5 50% = 50.67  
 HC10 50% = 67.82  
 HC20 50% = 100.86

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

LR (Interim) TV (HC1 50%) =  $31.46 \div 10 = 3 \mu\text{g/L}$

The other levels of protection are:

99%	95%	90%	80%
3.146	5.067	6.782	10.086

These were rounded off to

3      5      7      10  $\mu\text{g/L}$

## 1,2,4,5-Tetrachlorobenzene [CAS No. 95-94-3]

### Fresh and Marine water

#### Fails HR and MR

#### LR (Interim) Calculations using QSAR derived toxicity data

The data used to derive the TV were:

90	105.7	212.9	198.7	404	253.7
70.8	91.3	250.2	96.0	249	70.8

HC1 50%	=	53.65
HC5 50%	=	66.01
HC10 50%	=	74.95
HC20 50%	=	89.09

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 53.65 \div 10 = 5.5 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
5.365	6.601	7.495	8.909

These were rounded off to

5	7	8	9 $\mu\text{g/L}$
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## Pentachlorobenzene [CAS No. 608-93-5]

### Fresh and Marinewater

#### Fails HR and MR

#### Calculations for LR (interim) TV using QSAR derived toxicity data

The data used to derive the TV were:

34	31.41	60.73	7260	1130	3040
2270	1770	342	32.3	10200	943
78.3	73.1	165	24.7	92.0	34.8
89.2	19.2	88.4			

**NOTE:** The above data contains a number of data that are greater than twice the aqueous solubility (i.e. 480  $\mu\text{g/L}$ - the solubility cut-off for toxicity data). These data were removed and the remaining data put through the Burr distribution method.

34	31.41	60.73	342	32.3	78.3
73.1	165	24.7	92.0	34.8	
89.2	19.2	88.4			

HC1 50%	=	16.05
HC5 50%	=	21.03
HC10 50%	=	24.82
HC20 50%	=	52.79

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 16.05 \div 10 = 1.6 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
1.605	2.103	2.482	5.279

These were rounded off to

1.5    2    2.5    5  $\mu\text{g/L}$

## **Hexachlorobenzene [118-74-1]**

### **Fresh and Marine water**

#### **Fails HR and MR**

#### **Calculations for LR (interim) TV using QSAR derived data**

The data used to derive the TV were:

2920	572	1540	1090	811
131	10.3	4320	390	30
28	70	6.24	7.06	35.2
13.2	33.3	5.48	32.2	1.8

**NOTE:** The above data contains a number of data that were greater than twice the aqueous solubility (i.e. 12  $\mu\text{g/L}$ - the solubility cut-off for toxicity data). These data were removed and the remaining data put through the Burr distribution method.

10.3            6.24            7.06            5.48            1.8

HC1 50%	=	0.534
HC5 50%	=	1.40
HC10 50%	=	2.125
HC20 50%	=	3.22

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{LR (Interim) TV (HC1 50\%)} = 0.53 \div 10 = 0.05 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0534	0.14	0.2125	0.322

These were rounded off to

0.05    0.1    0.2    0.3  $\mu\text{g/L}$

## **1-Chloronaphthalene [90-13-1]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, a fish and a crustacean.

Therefore Only a LR(ECL) TV could be derived.

$$\begin{aligned}\text{LR(ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1600 \mu\text{g/L} \div 1000 \\ &= 1.6 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were only acute toxicity data for 1 species, a fish.

Therefore Only a LR(ECL) TV could be derived.

$$\begin{aligned}\text{LR(ECL) TV} &= \text{lowest value} \div 1000 \\ &= 690 \mu\text{g/L} \div 1000 \\ &= 0.69 \mu\text{g/L}\end{aligned}$$

This was rounded off to 0.7  $\mu\text{g/L}$

$$\text{Therefore LR(ECL) TV} = 0.7 \mu\text{g/L}$$

## **Capacitor 21 [CAS No. 66419-38-3]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 8 species which belonged to 2 different taxonomic groups.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1.5 \mu\text{g/L} \div 1000 \\ &= 0.0015 \mu\text{g/L}\end{aligned}$$

This was rounded to 0.002  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 0.002 \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.002 \mu\text{g/L}$$

## **Aroclor 1016 [CAS No. 12674-11-2]**

### **Freshwater**

#### **Fails HR and MR**

After screening there were only acute toxicity data for 14 species which belonged to two different taxonomic groups (fish & amphibia).



Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1.08 \mu\text{g/L} \div 1000 \\ &= 0.00108 \mu\text{g/L}\end{aligned}$$

Which was rounded off to 0.001  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 0.001 \mu\text{g/L}$$

## **Marine**

After screening there were acute toxicity data for 3 species which belonged to 2 different taxonomic groups (crustacea & molluscs).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 9.1 \mu\text{g/L} \div 1000 \\ &= 0.009 \mu\text{g/L}\end{aligned}$$

## **Aroclor 1221 [CAS No. 11104-28-2]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, which belonged to 1 taxonomic group (fish).

$\therefore$  Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1050 \mu\text{g/L} \div 1000 \\ &= 1.05 \mu\text{g/L}\end{aligned}$$

This was rounded off to 1  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 1 \mu\text{g/L}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) was adopted for marine waters.

$$\text{LR (ECL) TV} = 1 \mu\text{g/L}$$

## **Aroclor 1232 [CAS No. 11141-16-5]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, which belonged to 1 taxonomic group (fish).

$\therefore$  Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 320 \mu\text{g/L} \div 1000 \\ &= 0.32 \mu\text{g/L}\end{aligned}$$

This was rounded off to 0.3 µg/L

LR (ECL) TV = 0.3 µg/L

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

LR (ECL) TV = 0.3 µg/L

## Aroclor 1242 [CAS No. 53469-21-9]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

5414.98	15	471.17	10	27.02	400
11.66	39.81	4.08			

HC1 50%	=	1.833
HC5 50%	=	3.662
HC10 50%	=	5.593
HC20 50%	=	9.955

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 5.87.

MR TV (HC1 50%) =  $1.833 \div 5.870 = 0.312 = 0.3 \mu\text{g/L}$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because aroclor-1242 can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.312265758	0.623850085	0.952810903	1.695911414

These were rounded off to

0.3	0.6	1.0	1.7 µg/L
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## Marine

### Fails HR and MR

There were no chronic toxicity data and only acute data for 1 species — a crustacean. Therefore only a LR (ECL) TV could be derived.

LR (ECL) TV	=	lowest value $\div$ 1000
	=	13 µg/L $\div$ 1000
	=	0.013 µg/L

However, the freshwater TV was of higher quality than the marine TV and was therefore adopted for marine waters.

$$\text{LR TV (HC1 50\%)} = 0.3 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because aroclor-1242 can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.312265758	0.623850085	0.952810903	1.695911414

These were rounded off to

0.3	0.6	1.0	1.7 $\mu\text{g/L}$
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## **Aroclor 1248 [CAS No. 12672-29-6]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 5 species, which belonged to 2 different taxonomic groups (fish and crustaceans).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 29 \mu\text{g/L} \div 1000 \\ &= 0.029 \mu\text{g/L} \end{aligned}$$

This was rounded up to 0.03  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 0.03 \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.03 \mu\text{g/L}$$

## **Aroclor 1254 [CAS No. 11097-69-1]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

1.18	145.33	2740	0.53	37110.07	0.32	7.70	1262.93	9
2400	2400	100	200	4.57	11.95	1.90		

HC1 50%	=	0.11
HC5 50%	=	0.39
HC10 50%	=	0.85
HC20 50%	=	2.43

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV is derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (fish) was 11.38.

$$\text{MR TV (HC1 50\%)} = 0.11 \div 11.38 = 0.0097 = 0.01 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because aroclor-1242 can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0097	0.034	0.075	0.214

These were rounded off to

0.01	0.03	0.07	0.2 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were only acute toxicity data for 3 species that belonged to one taxonomic group — fish. Therefore, the data only meet the minimum data requirements of a LR (ECL) TV. However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{MR TV (HC1 50\%)} = 0.11 \div 11.38 = 0.0097 = 0.01 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because aroclor-1242 can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0097	0.034	0.075	0.214

These were rounded off to

0.01	0.03	0.07	0.2 $\mu\text{g/L}$
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## **Aroclor 1260 [CAS No. 11096-82-5] Freshwater Fails HR and MR**

There were only acute toxicity data for 1 species (a fish).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 25000 \mu\text{g/L} \div 1000 \\ &= 25 \mu\text{g/L} \end{aligned}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater ECL was adopted for marine waters.

$$\text{LR (ECL) TV} = 25 \mu\text{g/L}$$

## **Aroclor 1262 [CAS No. 37324-23-5]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species (a fish).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 50000 \mu\text{g/L} \div 1000 \\ &= 50 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 50 \mu\text{g/L}$$

## **Aroclor 1268 [CAS No. 11100-14-4]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species (a fish).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 50000 \mu\text{g/L} \div 1000 \\ &= 50 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 50 \mu\text{g/L}$$

## **2,3,4'-trichlorobiphenyl [CAS No. 38444-85-8]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species (a crustacean).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 70 \mu\text{g/L} \div 1000 \\
 &= 0.07 \mu\text{g/L}
 \end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.07 \mu\text{g/L}$$

## **4,4'-dichlorobiphenyl [CAS No. 2050-68-2]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species (a crustacean).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 100 \mu\text{g/L} \div 1000 \\
 &= 0.1 \mu\text{g/L}
 \end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.1 \mu\text{g/L}$$

## **2,2',4,5,5'-pentachloro-1,1'-biphenyl [CAS No. 37680-73-2]**

### **Freshwater**

#### **Fails HR and MR**

After screening there were only acute toxicity data for one species (crustacea).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 210 \mu\text{g/L} \div 1000 \\
 &= 0.21 \mu\text{g/L}
 \end{aligned}$$

Which was rounded off to 0.02  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 0.2 \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.2 \mu\text{g/L}$$

## 2,4,6,2',4',6'-hexachlorobiphenyl [CAS No. 33979-03-2]

### Freshwater

#### Fails HR and MR

After screening there were only acute toxicity data for one species (a crustacean).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 150 \mu\text{g/L} \div 1000 \\ &= 0.15 \mu\text{g/L}\end{aligned}$$

### Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.15 \mu\text{g/L}$$

## Phenol [CAS No. 108-95-2]

### Fails HR

#### MR Calculations

The data used to derive the TV were:

6734.98	9499.47	14094.33	15499.68	27970.57	46752.47
10600	46000	1555	31500	23595.69	6984.64
30499.84	8000	32196.58	33408.61	16700	36300
32465.37	18435.23	16000	23520.69	10860.49	8410.73
42252.22	34751.20	9000	37229.02	40029.17	7093.66
21794.49	64652.92	103963.09	50000	36000	126000
8800	32000	7337.58	42000	20000	114000
132000	106338.63	7000	16553.55	11714.25	56483.71
39700	130000	22912.88	37400	63029.84	55645.51
18000	21000	57000	6000	37000	16000
50000	30000	190000	190000	16933.69	2000
670820.39	240000	944911.28	346410.16	161961.09	80500
33602.96	28000	50000	287749.89	69800	2000000
16000	200000	1000000	440000	860000	
432666.15	1084634.89	214476.11	500000	2000	30000
2000	7000	50000	7000	450000	100000
400000	2000	24000	1074342.85	280000	
173129.25	22000	30000	70888.67	854634.42	50000
1000000	580000	564621.62	320000	100000	
157590.97	160790.56	265000	125701.75	350000	
368385.17	288444.1	260000	107000	94000	520000
370000	920516.41	1000000	1000000	95394.71	420000
357559.07	120000	460000	1080000	480000	1280000
290000	823771.81	35600	120000	750999.33	340000
59000	230867.93	100000	66675.64	150000	64000
148098.49	370000	102000	72876.27		
HC1 50%	=	1386			
HC5 50%	=	5269			
HC10 50%	=	9843			
HC20 50%	=	19844			

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There ACR for all species was 16.278.

$$\text{MR TV} = 5269 \div 16.278 = 323.688 = 325 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
85.15603883	323.7013	604.6904	1219.047

These were rounded off to

85	320	600	1200 $\mu\text{g/L}$
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## **Marine Fails HR MR Calculations**

The data used to derive the TV were:

10000	10000	11000	16040.57	5200	9500	20459.49
14230	41632.47	56000	56000	21729.47	128048.43	181439.14
10846.35	175000	52800	122250.85	222620.44	49878	13000

HC1 50%	=	4394
HC5 50%	=	6571
HC10 50%	=	8405
HC20 50%	=	11752

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There ACR for all species was 16.278.

$$\text{MR TV} = 4375 \div 16.278 = 268.77 = 270 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
269.954	403.666	516.367	721.931

These were rounded off to

270	400	520	720 $\mu\text{g/L}$
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## **2,4-dimethylphenol [CAS No. 105-67-9] Freshwater Fails Hr and MR**

There were only acute toxicity data for 4 species which belonged to 3 taxonomic groups (a fish, crustacea and protozoa).

$\therefore$  Only a LR (ECL) TV could be derived.



$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 2100 \mu\text{g/L} \div 1000 \\
&= 2.1 \\
&\approx 2 \mu\text{g/L}
\end{aligned}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{Therefore LR (ECL) TV} = 2 \mu\text{g/L}$$

## Nonyl phenols

### Freshwater

#### Fails HR and MR

There were only chronic toxicity data for 1 species, a crustacean. There were only acute toxicity data for 3 species which belonged to 2 taxonomic groups (fish and crustacea).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\
&= 24 \mu\text{g/L} \div 200 \\
&= 0.12 \\
&\approx 0.1 \mu\text{g/L}
\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

## Marine

There were only toxicity data for 1 species, a crustacean.

Only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 1230 \mu\text{g/L} \div 1000 \\
&= 1.23 \mu\text{g/L}
\end{aligned}$$

This was rounded off to 1  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 1 \mu\text{g/L}$$

## 2-monochlorophenol [CAS No. 95-57-8]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

10700	20472.73	8674.24	13458.27	5235.81
6900	170000	50000	70000	67970

HC1 50%	=	3351
HC5 50%	=	4944
HC10 50%	=	6273
HC20 50%	=	8673

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR for this chemical.

$$\text{MR TV (HC1 50\%)} = 3351 \div 10 = 335.1 \approx 340 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the HC5 50% failed to protect *D. magna* from chronic toxicity.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
335.1	494.4	627.3	867.3

These were rounded off to

340	490	630	870 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were only acute toxicity data for 2 marine species which both belonged to 1 taxonomic group — fish. Therefore, the data meets the minimum data requirements of a LR (ECL) TV.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 6290 \div 1000 \\ &= 6.3 \mu\text{g/L}\end{aligned}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{MR TV (HC1 50\%)} = 3351 \div 10 = 335.1 \approx 340 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because 2-chlorophenol can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
335.1	494.4	627.3	867.3

These were rounded off to

340	490	630	870 $\mu\text{g/L}$
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## **3-monochlorophenol [CAS No. 108-43-0] Freshwater Fails Hr and MR**

There were only acute toxicity data for 2 species, a fish and a green alga.

$\therefore$  Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 4,500 \mu\text{g/L} \div 1000 \\ &= 4.5 \mu\text{g/L}\end{aligned}$$

## Marine

There were only acute toxicity data for 1 species, a fish.

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 3990 \mu\text{g/L} \div 1000 \\ &= 3.99 \mu\text{g/L}\end{aligned}$$

This was rounded up to 4  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 4 \mu\text{g/L}$$

## 4-monochlorophenol [CAS No. 106-48-9]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

4900	7836.75	3800	1910	4642.09	9000
3471.31	12856	29000	9005.76	36680	

HC1 50%	=	1569
HC5 50%	=	2245
HC10 50%	=	2764
HC20 50%	=	3631

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 5.74. The HC5 50% figure did not provide adequate protection from chronic toxicity to fish and invertebrates. As the first approach is to use the default ACR (given that there is a degree of uncertainty about ACRs). The resultant HC5 50% figure provided adequate protection from chronic toxicity.

$$\text{MR TV} = 2245 \div 10 = 224.5 = 220 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
156.9	224.5	276.4	363.1

These were rounded off to

160	220	280	360 $\mu\text{g/L}$
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## Marine

### Fails HR and MR

There were chronic toxicity data for only 2 species, which belonged to 2 taxonomic groups (green alga and diatom). There were acute toxicity data for 2 species that belonged to 1 taxonomic group (fish).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1286 \mu\text{g/L} \div 1000 \\ &= 1.3 \mu\text{g/L}\end{aligned}$$

However, the freshwater TV was of higher quality than this and should therefore be adopted for marine waters.

$$\text{LR TV} = 2245 \div 10 = 224.5 = 220 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
156.9	224.5	276.4	363.1

These were rounded off to

160	220	280	360 $\mu\text{g/L}$
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## **2,3-dichlorophenol [CAS No. 576-24-9]**

### **Freshwater**

#### **Fails HR and MR**

There were only chronic toxicity data for 1 species, an alga. There were only acute toxicity data for 2 species that belonged to 2 taxonomic groups (fish and crustacea).

$\therefore$  Only a LR (interim) TV could be derived.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 3100 \mu\text{g/L} \div 100 \\ &= 31 \mu\text{g/L} \end{aligned}$$

### **Marine**

#### **Fails HR and MR**

There were no chronic toxicity data and only acute data for 1 species, a fish.

$\therefore$  Only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 4380 \mu\text{g/L} \div 1000 \\ &= 4.4 \mu\text{g/L} \end{aligned}$$

However, the freshwater TV was of higher quality than this and should therefore be adopted for marine waters.

$$\text{LR TV} = 31 \mu\text{g/L}$$

## **2,4-dichlorophenol [CAS No. 120-83-2]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

6300	2000	2600	8079.75	1911.54	2500
9200	11500	38644.88	15000		

$$\text{HC1 50\%} = 1172$$

HC5 50%	=	1644
HC10 50%	=	2022
HC20 50%	=	2680

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR for this chemical.

$$\text{MR TV (HC1 50\%)} = 1172 \div 10 = 117.2 = 120 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the TV did not provide adequate protection for some of the species from chronic toxicity.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
117.2	164.4	202.2	268

These were rounded off to

120	160	200	270 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were chronic toxicity data for 1 species that belonged to 1 taxonomic group (diatom). There were only acute toxicity data for 2 species that belonged to 1 taxonomic group (fish).

$\therefore$  Only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 815 \mu\text{g/L} \div 1000 \\ &= 0.815 \mu\text{g/L} \end{aligned}$$

However, the freshwater TV was of higher quality than this and should therefore be adopted for marine waters.

$$\text{LR TV (HC1 50\%)} = 120 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the TV did not provide adequate protection to some of the chronic toxicity data.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
117.2	164.4	202.2	268

These were rounded off to

120	160	200	270 $\mu\text{g/L}$
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## **2,5-dichlorophenol [CAS No. 583-78-8]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species which belonged to two taxonomic groups (fish & protozoa).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 3300 \mu\text{g/L} \div 1000 \\ &= 3.3 \mu\text{g/L} \\ &\approx 3 \mu\text{g/L}\end{aligned}$$

### **Marine**

#### **Fails HR and MR**

There were acute toxicity data for 1 species, a fish.

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 3290 \mu\text{g/L} \div 1000 \\ &= 3.29 \mu\text{g/L} \\ &\approx 3 \mu\text{g/L}\end{aligned}$$

## **2,6-dichlorophenol [CAS No. 87-65-0]**

### **Freshwater**

#### **Fails HR and MR**

There were chronic toxicity data for 2 species that belonged to 1 taxonomic group (green alga). There were only acute toxicity data for 2 species that belonged to 2 taxonomic groups (fish and crustacea). By combining the data there were values for 4 species that belonged to 3 taxonomic groups (fish, crustacea and green alga).

∴ Only a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 3400 \mu\text{g/L} \div 100 \\ &= 34 \mu\text{g/L}\end{aligned}$$

### **Marine**

#### **Fails Hr and MR**

There were acute toxicity data for 1 species, a fish.

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 5400 \mu\text{g/L} \div 1000 \\ &= 5.4 \mu\text{g/L} \\ &\approx 5 \mu\text{g/L}\end{aligned}$$

However, the freshwater TV was of higher quality than this and should therefore be adopted for marine waters.

$$\text{LR TV} = 34 \mu\text{g/L}$$

### **3,4-dichlorophenol [CAS No. 95-77-2]**

#### **Freshwater**

##### **Fails HR and MR**

There were only acute toxicity data for 2 species, a fish and a green alga  
∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1900 \mu\text{g/L} \div 1000 \\ &= 1.9 \mu\text{g/L} \\ &\approx 2 \mu\text{g/L} \end{aligned}$$

#### **Marine**

There were acute toxicity data for only 1 species, a fish

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2300 \mu\text{g/L} \div 1000 \\ &= 2.3 \mu\text{g/L} \\ &\approx 2 \mu\text{g/L} \end{aligned}$$

### **3,5-dichlorophenol [CAS No. 591-35-5]**

#### **Freshwater**

##### **Fails HR and MR**

There were acute toxicity data for 1 species that belonged to 1 taxonomic group — a fish. There were chronic toxicity data for 2 species that belonged to 1 taxonomic group — green alga. By combining the data there were toxicity data for 3 species which belonged to 2 different taxonomic groups (fish and green alga).

∴ Only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 2000 \\ &= 890 \mu\text{g/L} \div 200 \\ &= 4.5 \mu\text{g/L} \end{aligned}$$

Which was rounded down to 4  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 4 \mu\text{g/L}$$

#### **Marine**

##### **Fails HR and MR**

There were only acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 3500 \mu\text{g/L} \div 1000 \\
&= 3.5 \\
&\approx 4 \mu\text{g/L}
\end{aligned}$$

## **2,3,4-trichlorophenol [CAS No. 15950-66-0]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species, a fish and there were only chronic toxicity data for 1 species — a green alga.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 1100 \mu\text{g/L} \div 1000 \\
&= 1.1 \\
&\approx 1 \mu\text{g/L}
\end{aligned}$$

### **Marine**

There were acute toxicity data for only 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 4310 \mu\text{g/L} \div 1000 \\
&= 4.3 \\
&= 4 \mu\text{g/L}
\end{aligned}$$

## **2,3,5-trichlorophenol [CAS No. 933-78-8]**

### **Freshwater**

#### **Fails HR and MR**

There were no toxicity data for freshwater species. Therefore the marine LR (ECL) TV was adopted for freshwater.

$$\text{LR (ECL) TV} = 2 \mu\text{g/L}$$

### **Marine**

There were only acute toxicity data for 1 species, a fish

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 2310 \mu\text{g/L} \div 1000 \\
&= 2.3 \\
&\approx 2 \mu\text{g/L}
\end{aligned}$$



## 2,3,6-trichlorophenol [CAS No. 933-75-5]

### Freshwater

#### Fails HR and MR

There were no toxicity data for freshwater species. Therefore the marine LR (ECL) TV was adopted for freshwater.

$$\text{LR (ECL) TV} = 2 \mu\text{g/L}$$

### Marine

There were only acute toxicity data for 2 species, both of which were fish

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2130 \mu\text{g/L} \div 1000 \\ &= 2.1 \mu\text{g/L} \\ &\approx 2 \mu\text{g/L} \end{aligned}$$

## 2,4,5-trichlorophenol [CAS No. 95-95-4]

### Freshwater

#### Fails HR and MR

There were acute toxicity data for 5 species from 2 taxonomic groups, 4 fish and a crustacean. Only one chronic data point was available (361  $\mu\text{g/L}$  NOEC growth for *P. promelas*) but this was not used.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 450 \mu\text{g/L} \div 1000 \\ &= 0.45 \mu\text{g/L} \end{aligned}$$

This was rounded off to 0.5  $\mu\text{g/L}$

### Marine

There were acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 4010 \mu\text{g/L} \div 1000 \\ &= 4 \mu\text{g/L} \end{aligned}$$

## 2,4,6-trichlorophenol [CAS No. 88-06-2]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

643.43	2220.13	1768.94	362.22	646.75	5466.14
779.33	5500	10000	5600	3500	1200
3990					

HC1 50%	=	26.29
HC5 50%	=	179.78
HC10 50%	=	411.46
HC20 50%	=	941.7

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR There was no ACR.

$$\text{MR TV (HC1 50\%)} = 26.29 \div 10 = 2.269 \approx 3 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because 2,4,6-trichlorophenol can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2.629	17.98	41.15	94.17

These were rounded off to

3	20	40	95 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were acute toxicity data for 3 species that belonged to 2 taxonomic groups (fish and crustacea) and there was chronic toxicity data for 1 species — a diatom.

Therefore a LR (interim) TV could be derived.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 1400 \div 100 \\ &= 14 \mu\text{g/L} \end{aligned}$$

However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

$$\text{LR TV (HC1 50\%)} = 3 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because 2,4,6-trichlorophenol can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2.629	17.98	41.15	94.17

These were rounded off to

3	20	40	95 $\mu\text{g/L}$
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## **2,3,4,5-tetrachlorophenol [CAS No. 4901-51-3]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, both of which were fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 205 \mu\text{g/L} \div 1000 \\ &= 0.2 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1500 \mu\text{g/L} \div 1000 \\ &= 1.5 \mu\text{g/L}\end{aligned}$$

This was rounded off to 2  $\mu\text{g/L}$

## **2, 3, 4, 6-tetrachlorophenol [CAS No. 58-90-2]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

834.51	140	620	1030	750	334.96
295.40	300	690	650	10100	1300

$$\begin{aligned}\text{HC1 50\%} &= 112.6 \\ \text{HC5 50\%} &= 177.0 \\ \text{HC10 50\%} &= 226.4 \\ \text{HC20 50\%} &= 308.8\end{aligned}$$

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 2.05.

$$\text{MR TV (HC1 50\%)} = 112.6 \div 2.05 = 54.927 = 55 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
54.92682927	86.34146341	110.4390244	150.6341463

However, this TV did not provide sufficient protection. Therefore, a default AF of 10 was used rather than the ACR.

$$\text{MR TV (HC1 50\%)} = 112.6 \div 10 = 11.26 = 11 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
11.26	17.7	22.64	30.88

These were rounded off to

10	20	25	30 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute data for 3 species which belonged to 3 taxonomic groups (fish, crustacea and mollusca).

Therefore a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 1000 \\ &= 1100 \div 1000 \\ &= 1.1 \mu\text{g/L} \end{aligned}$$

However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

$$\text{LR TV (HC1 50\%)} = 11 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because 2,3,4,6-tetrachlorophenol can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
11.26	17.7	22.64	30.88

These were rounded off to

10	20	25	30 µg/L
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## **2,3,5,6-tetrachlorophenol [CAS No. 935-95-5] Freshwater Fails HR and MR**

There were only acute toxicity data for 2 species, 1 fish, 1 crustacean while there were chronic toxicity data for 1 species, a protozoan.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL)} &= \text{lowest value} \div 1000 \\ &= 170 \mu\text{g/L} \div 1000 \\ &= 0.17 \mu\text{g/L} \\ &\approx 0.2 \mu\text{g/L} \end{aligned}$$

## Marine

There were only acute toxicity data for 3 species, 2 fish and a crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1390 \div 1000 \\ &= 1.390 \\ &\approx 1.4 \mu\text{g/L} \end{aligned}$$

## Pentachlorophenol [CAS No. 87-86-5]

### Freshwater

### HR Calculations

The data used to derive a HR TV were:

41	271	44.9	100	250	50
50	94.87	144.19	20	89.44	

HC1 50%	=	14.56
HC5 50%	=	24.07
HC10 50%	=	30.94
HC20 50%	=	41.67

$$\text{HR TV (HC1 50\%)} = 14.56 = 15 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because pentachlorophenol can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
14.56	24.07	30.94	41.67

However, the above TV was not used as it did not provide adequate protection for even acute toxicity data. Therefore, the MR TV was calculated, given that there was a much larger acute data set.

### MR Calculation

The aqueous solubility of pentachlorophenol is 14mg/L. Therefore the maximum concentration for toxicity data to be included in the calculation of the TV is 28 000 µg/L.

The data used to derive the TV were:

71.75	513.81	511.40	145.54	87	85
482.49	39.47	45	393.32	331.31	68.59
211.18	449.12	84.36	38	603.76	202.37
93.38	284.55	45.91	247.89	797.76	217.30
103.54	54	761.58	70	202.74	253.55
812.16	440	1500	410.24	649.73	701.43
317.49	391.85	700	520	220	68
220.14	170	1521.18	110	250.55	380
1260	1210	149.31	258.07	144.57	492.95
547.72	192.65	172.07	387.64	562.10	1111.06
730	130	489.9	300.33	90	80
183	310	300	100	208.49	260
400	3200	3265.15	9822.56	7200	5900

11000	7000	10 300	21865.86
HC1 50%	=	16.40	
HC5 50%	=	47.18	
HC10 50%	=	75.09	
HC20 50%	=	122.2	

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 4.54.

$$\text{MR TV (HC1 50\%)} = 16.40 \div 4.54 = 3.61 = 3.6 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because pentachlorophenol can bioaccumulate and the HC5 50% did not provide an adequate margin of safety for fish acute toxicity.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3.612	10.392	16.540	26.916

These were rounded off to

3.6	10	17	27 $\mu\text{g/L}$
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## **Marine Fails HR MR Calculations**

The data used to derive the TV were:

272.03	450	728.90	172.51	1495.71	450
4804.98	82	10000	3300	371	541.74
141.53	7500	6145.20	184.39	1200	344
163	482	18000	642.52	67	1039.28
2100	785.94	5500	3600	3000	

HC1 50%	=	51.24
HC5 50%	=	101.16
HC10 50%	=	148.90
HC20 50%	=	245.9

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV is derived using acute toxicity data it is a MRTV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 4.54.

$$\text{MR TV (HC1 50\%)} = 51.24 \div 4.54 = 11.286 = 11.3 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
11.28634361	22.28193833	32.79735683	54.16299559

These were rounded off to

11	22	33	55 $\mu\text{g/L}$
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## **2-nitrophenol [CAS No. 88-75-5]**

### **Freshwater**

#### **Fails HR and MR**

There were acute toxicity data for 3 species which belonged to 2 taxonomic groups: fish and crustacea.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1600 \mu\text{g/L} \div 1000 \\ &= 1.6 \mu\text{g/L} \\ &\approx 2 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were only acute toxicity data for 2 species which belonged to 2 taxonomic groups — fish and crustacea.

Therefore only a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2100 \mu\text{g/L} \div 1000 \\ &= 2.1 \mu\text{g/L} \\ &= 2 \mu\text{g/L}\end{aligned}$$

## **3-nitrophenol [CAS No. 554-84-7]**

### **Freshwater**

#### **Fails HR and MR**

There were acute toxicity data for 1 species, a fish.

Therefore only a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1300 \mu\text{g/L} \div 1000 \\ &= 1.3 \mu\text{g/L} \\ &\approx 1 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{Therefore LR (ECL) TV} = 1 \mu\text{g/L}$$

## **4-nitrophenol [CAS No. 100-02-7]**

### **Freshwater**

#### **Fails HR and MR**

There were chronic toxicity data for 3 species that belong to 3 taxonomic groups (fish, crustacea and green alga). There were acute toxicity data for 13 species that belong to 3 taxonomic groups (fish, crustacea and green algae).

Therefore a LR (interim) TV can be derived.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 20 \\ &= 1160 \div 20 \\ &= 58 \mu\text{g/L} \end{aligned}$$

**Marine  
Fails HR and MR**

There were only chronic toxicity data for 1 species — a fish. There were only acute toxicity data for 5 species that belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2700 \div 1000 \\ &= 2.7 \mu\text{g/L} \end{aligned}$$

However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

$$\text{LR TV} = 58 \mu\text{g/L}$$

**2,4-dinitrophenol [CAS No. 51-28-5]**

**Freshwater**

**Fails HR**

**MR Calculations**

The data used to derive the TV were:

23000	550	6867.36	520	5065.98	1568.88	1165.59
2019.12	11432.49	4394.43	3806.99	6490	26000	

HC1 50%	=	131.7
HC5 50%	=	447.4
HC10 50%	=	776.0
HC20 50%	=	1406

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 447.7 \div 10 = 44.74 = 45 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
13.17	44.743	77.602	140.563

These were rounded off to

13	45	80	140 $\mu\text{g/L}$
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**Marine  
Fails HR and MR**

There were chronic toxicity data for only 1 species, a fish. There were acute toxicity data for 5 species that belong to 2 taxonomic groups (fish and crustacea).



Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 200 \div 1000 \\ &= 0.2 \mu\text{g/L}\end{aligned}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{MR TV} = 447.7 \div 10 = 44.74 = 45 \mu\text{g/L}$$

The other levels of protection are:

99%	95%	90%	80%
13.17	44.743	77.602	140.563

These were rounded off to

13	45	80	140 $\mu\text{g/L}$
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## **2,4,6-trinitrophenol [CAS No. 88-89-1]**

### **Freshwater**

#### **Fails HR and MR**

There were chronic toxicity data for 3 species that belonged to 2 taxonomic groups (crustacea and green alga). There were acute toxicity data for 5 species that belonged to 3 taxonomic groups (fish, crustacea and green alga).

Therefore only a LR (interim) TV could be derived. An Assessment factor of 20 was used as the lowest datum point was chronic.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 20 \\ &= 5000 \div 20 \\ &= 250 \mu\text{g/L}\end{aligned}$$

### **Marine**

#### **Fails HR and MR**

There were only acute toxicity data for 2 species, which belonged to 2 taxonomic groups (fish and mollusca).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 57050 \div 1000 \\ &= 57 \mu\text{g/L}\end{aligned}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{LR TV} = 250 \mu\text{g/L}$$

## **Carbon disulfide [CAS: 75-15-0]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 3 species, 1 fish, 1 crustacean and 1 alga.

Therefore only a LR (Interim) TV could be derived.

$$\begin{aligned}\text{LR (Interim) TV} &= \text{lowest value} \div 100 \\ &= 2100 \mu\text{g/L} \div 100 \\ &= 21 \mu\text{g/L} \\ &\approx 20 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were toxicity data for only 1 marine species. Therefore only a LR (ECL) TV could be derived (would give a value of 65 (65000/1000)). However, the freshwater LR (interim) TV was of higher quality and was therefore adopted as the LR TV for marine waters.

$$\text{Therefore LR TV} = 20 \mu\text{g/L}$$

## **N-propylsulfide [CAS: 111-47-7]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species — a fish

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 21700 \mu\text{g/L} \div 1000 \\ &= 21.7 \mu\text{g/L}\end{aligned}$$

Which was rounded down to 20  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 20 \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 20 \mu\text{g/L}$$

## **Propyl disulfide [CAS: 629-19-6]**

### **Freshwater**

#### **Fails HR and MR**

There were acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\text{LR (ECL) TV} = \text{lowest value} \div 1000$$

$$\begin{aligned}
&= 2620 \mu\text{g/L} \div 1000 \\
&= 2.62 \mu\text{g/L} \\
&= 2.6 \mu\text{g/L} \\
&\approx 3 \mu\text{g/L}
\end{aligned}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{Therefore LR (ECL) TV} = 3 \mu\text{g/L}$$

## Isopropyl disulfide [CAS: 4253-89-8]

### Freshwater

#### Fails HR and MR

There were acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 8310 \mu\text{g/L} \div 1000 \\
&= 8.31 \mu\text{g/L}
\end{aligned}$$

This was rounded off to 8  $\mu\text{g/L}$ .

$$\text{LR (ECL) TV} = 8 \mu\text{g/L}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{Therefore LR (ECL) TV} = 8 \mu\text{g/L}$$

## tert-butyl sulfide [CAS: 107-47-1]

### Freshwater

#### Fails HR and MR

There were acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 29,100 \mu\text{g/L} \div 1000 \\
&= 29.1 \mu\text{g/L} \\
&= 29 \mu\text{g/L} \\
&\approx 30 \mu\text{g/L}
\end{aligned}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{Therefore LR (ECL) TV} = 30 \mu\text{g/L}$$

## **Phenyldisulfide [CAS 882-33-7]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species, a fish

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 110 \mu\text{g/L} \div 1000 \\ &= 0.11 \mu\text{g/L}\end{aligned}$$

Which was rounded up to 0.1  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 0.1 \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.1 \mu\text{g/L}$$

## **Bis(dimethylthiocarbamyl)sulfide [CAS: 97-74-5]**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic toxicity data and only acute data for 3 species, which belonged to 3 taxonomic groups (fish, crustacea and green alga).

Therefore only a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 1000 \mu\text{g/L} \div 100 \\ &= 10 \mu\text{g/L}\end{aligned}$$

### **Marine**

#### **Fails HR and MR**

There were no toxicity data for marine organisms. Therefore the freshwater LR (interim) TV was adopted for marine waters.

$$\text{LR TV} = 10 \mu\text{g/L}$$

## **Bis(diethylthiocarbamyl)disulfide [CAS: 97-77-8]**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic toxicity data and only acute data for 3 species, which belonged to 3 taxonomic groups (fish, crustacea and green alga, i.e. OECD MPD). The data used to derive the TV for this chemical are not in the database. Therefore, the data from the database should not be used to derive any site-specific TVs or to recalculate TVs as more data becomes available. The data used to derive the TV were obtained from AQUIRE but may not have been sufficiently screened. Hence, only a low reliability TV could be calculated, as an interim indicative working level.

Therefore only a LR (interim) TV could be derived.

$$\begin{aligned}
 \text{LR (interim) TV} &= \text{lowest value} \div 100 \\
 &= 120 \mu\text{g/L} \div 100 \\
 &= 1 \mu\text{g/L}
 \end{aligned}$$

## **Marine**

### **Fails HR and MR**

There were no toxicity data for marine organisms. Therefore the freshwater LR (interim) TV was adopted for marine waters.

$$\text{LR TV} = 1 \mu\text{g/L}$$

## **2-methoxy-4H-1,3,2-benzodioxaphosphorium-2-sulfide [CAS: 3811-49-2]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 5 species, which belonged to 2 taxonomic groups (fish and mollusca).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 2000 \mu\text{g/L} \div 1000 \\
 &= 2 \mu\text{g/L}
 \end{aligned}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{Therefore LR (ECL) TV} = 2 \mu\text{g/L}$$

## **Potassium amyl xanthate**

### **Freshwater**

#### **Fails HR and MR**

A compilation of toxicity data by Hawley (1977) came very late during the derivation process and it was not possible to obtain the original references before the guidelines were completed. Some of the values reported by Hawley (1977) were much lower than the screened figures that are in the database. For this reason it was considered appropriate to base the ECL figures on median values of the lowest unpublished ranges reported by Hawley (1977). The median of the values from Hawley (1977) for sodium ethyl xanthate was 500  $\mu\text{g/L}$ .

There were no chronic data and only acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 500 \mu\text{g/L} \div 1000 \\ &= 0.5 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater ECL was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.5 \mu\text{g/L}$$

## **Potassium ethyl xanthate [CAS No. 140-89-6]**

### **Freshwater**

#### **Fails HR and MR**

A compilation of toxicity data by Hawley (1977) came very late during the derivation process and it was not possible to obtain the original references before the guidelines were completed. Some of the values reported by Hawley (1977) were much lower than the screened figures that are in the database. For this reason it was considered appropriate to base the ECL figures on median values of the lowest unpublished ranges reported by Hawley (1977). The median of the values from Hawley (1977) for sodium ethyl xanthate was 50  $\mu\text{g/L}$ .

There were no chronic data and only acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 50 \mu\text{g/L} \div 1000 \\ &= 0.05 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater ECL was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.05 \mu\text{g/L}$$

## **Potassium hexyl xanthate [CAS No. 2720-76-5]**

### **Freshwater**

#### **Fails HR and MR**

A compilation of toxicity data by Hawley (1977) came very late during the derivation process and it was not possible to obtain the original references before the guidelines were completed. Some of the values reported by Hawley (1977) were much lower than the screened figures that are in the database. For this reason it was considered appropriate to base the ECL figures on median values of the lowest unpublished ranges reported by Hawley (1977). The median of the values from Hawley (1977) for sodium ethyl xanthate was 450 000  $\mu\text{g/L}$ .

There were no chronic data and only acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 450\,000 \div 1000 \\
&= 450 \mu\text{g/L} \\
&\approx 500 \mu\text{g/L}
\end{aligned}$$

### **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater ECL was adopted for marine waters.

$$\text{LR (ECL) TV} = 500 \mu\text{g/L}$$

## **Potassium isopropyl xanthate [CAS No. 140-92-1]**

### **Freshwater**

#### **Fails HR and MR**

A compilation of toxicity data by Hawley (1977) came very late during the derivation process and it was not possible to obtain the original references before the guidelines were completed. Some of the values reported by Hawley (1977) were much lower than the screened figures that are in the database. For this reason it was considered appropriate to base the ECL figures on median values of the lowest unpublished ranges reported by Hawley (1977). The median of the values from Hawley (1977) for sodium ethyl xanthate was 14 000  $\mu\text{g/L}$ .

There were no chronic data and only acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 14\,000 \div 1000 \\
&= 14 \mu\text{g/L} \\
&\approx 15 \mu\text{g/L}
\end{aligned}$$

### **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater ECL was adopted for marine waters.

$$\text{LR (ECL) TV} = 15 \mu\text{g/L}$$

## **Sodium ethyl xanthate [CAS No. 140-90-9]**

### **Freshwater**

#### **Fails HR and MR**

A compilation of toxicity data by Hawley (1977) came very late during the derivation process and it was not possible to obtain the original references before the guidelines were completed. Some of the values reported by Hawley (1977) were much lower than the screened figures that are in the database. For this reason it was considered appropriate to base the ECL figures on median values of the lowest unpublished ranges reported by Hawley (1977). The median of the values from Hawley (1977) for sodium ethyl xanthate was 50  $\mu\text{g/L}$ .

There were no chronic data and only acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 50 \mu\text{g/L} \div 1000 \\ &= 0.05 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater ECL was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.05 \mu\text{g/L}$$

## **Sodium iso-butyl xanthate [CAS No. 2530-75-6]**

### **Freshwater**

#### **Fails HR and MR**

A compilation of toxicity data by Hawley (1977) came very late during the derivation process and it was not possible to obtain the original references before the guidelines were completed. Some of the values reported by Hawley (1977) were much lower than the screened figures that are in the database. For this reason it was considered appropriate to base the ECL figures on median values of the lowest unpublished ranges reported by Hawley (1977). The median of the values from Hawley (1977) for sodium sec-butyl xanthate was 4700  $\mu\text{g/L}$ .

There were no chronic toxicity data and only acute toxicity data for 2 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 4700 \mu\text{g/L} \div 1000 \\ &= 4.7 \\ &\approx 5 \mu\text{g/L}\end{aligned}$$

## **Marine**

### **Fails HR and MR**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 5 \mu\text{g/L}$$

## **Sodium isopropylxanthate [CAS No. 140-93-2]**

### **Freshwater**

#### **Fails HR and MR**

A compilation of toxicity data by Hawley (1977) came very late during the derivation process and it was not possible to obtain the original references before the guidelines were completed. Some of the values reported by Hawley (1977) were much lower than the screened figures that are in the database. For this reason it was considered appropriate to base the ECL figures on median values of the lowest unpublished ranges reported by Hawley (1977). The median of the values from Hawley (1977) for sodium isopropyl xanthate was 50  $\mu\text{g/L}$ .



There were no chronic toxicity data and only acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 50 \mu\text{g/L} \div 1000 \\ &= 0.05 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.05 \mu\text{g/L}$$

## **Sodium sec-butyl xanthate [CAS No. 36551-21-0]**

### **Freshwater**

#### **Fails HR and MR**

A compilation of toxicity data by Hawley (1977) came very late during the derivation process and it was not possible to obtain the original references before the guidelines were completed. Some of the values reported by Hawley (1977) were much lower than the screened figures that are in the database. For this reason it was considered appropriate to base the ECL figures on median values of the lowest unpublished ranges reported by Hawley (1977). The median of the values from Hawley (1977) for sodium sec-butyl xanthate was 4700  $\mu\text{g/L}$ .

There were no chronic toxicity data and only acute toxicity data for 2 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 4700 \mu\text{g/L} \div 1000 \\ &= 4.7 \\ &\approx 5 \mu\text{g/L}\end{aligned}$$

## **Marine**

### **Fails HR and MR**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 5 \mu\text{g/L}$$

## **Dimethylphthalate [CAS No. 131-11-3]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

50000      56000      68694.98      45900      377000      142000

HC1 50%	=	30417
HC5 50%	=	37461
HC10 50%	=	42554
HC20 50%	=	50616

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and was divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 37461 \div 10 = 3746.1 = 3750 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3041.7	3746.1	4255.4	5061.6

These were rounded off to

3000	3700	4300	5100 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute data for 2 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 29\,000 \mu\text{g/L} \div 1000 \\ &= 29 \mu\text{g/L} \end{aligned}$$

However, the freshwater TV was of higher quality and was therefore adopted for marine waters.

$$\text{LR TV} = 3750 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3041.7	3746.1	4255.4	5061.6

These were rounded off to

3000	3700	4300	5100 $\mu\text{g/L}$
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## **Diethylphthalate [CAS No. 84-66-2]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

16700	12000	16899.70	86000	13100	16000
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HC1 50%	=	8984
HC5 50%	=	10440
HC10 50%	=	11445
HC20 50%	=	12970

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 10440 \div 10 = 1044 = 1050 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
898.4	1044	1144.5	1297

These were rounded off to

900	1000	1100	1300 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute data for 2 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2900 \mu\text{g/L} \div 1000 \\ &= 2.9 \mu\text{g/L}\end{aligned}$$

However, the freshwater TV was of higher quality and therefore was adopted for marine waters.

$$\text{LR TV} = 1050 \mu\text{g/L}$$

However, this TV did not provide adequate protection to the most sensitive acute toxicity data. Therefore, the HC1 50% TV was adopted.

$$\text{LR TV} = 900 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
898.4	1044	1144.5	1297

These were rounded off to

900	1000	1100	1300 $\mu\text{g/L}$
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## **Dibutylphthalate [CAS No. 84-74-2]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

480	1600	1190.29	2940	6290	400
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Because toxicity data were limited to less than eight species, the Burr Type III distribution was applied with caution (as per the directions in the BurrliOZ software section of the 'TOX-Read Me' File on the CD-ROM and Internet site). The fit of the log-logistic and the selected Burr Type III distributions to

the data were compared. This showed that the log-logistic distribution fitted the data better than the selected Burr Type III distribution. Therefore, the Trigger Value and other levels of protection were calculated using the log-logistic distribution.

HC1 50%	=	91.97
HC5 50%	=	241.54
HC10 50%	=	373.46
HC20 50%	=	600.13

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for crustaceans was 9.29.

$$\text{MR TV (HC1 50\%)} = 91.97 \div 9.29 = 9.89 = 10 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because dibutylphthalate can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
9.89	26.0	40.2	64.59

These were rounded off to

10	26	40	65 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute data for 1 species, which was a crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 500 \mu\text{g/L} \div 1000 \\ &= 0.5 \mu\text{g/L} \end{aligned}$$

However, the freshwater TV was of higher quality and was therefore adopted for marine waters.

$$\text{LR TV (HC1 50\%)} = 26 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
26.16361679	37.3196986	46.39397201	62.36813778

These were rounded off to

25	35	45	60 $\mu\text{g/L}$
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## **Bis(2-ethylhexyl)phthalate [CAS No. 117-81-7] Freshwater Fails Hr and MR**

There were chronic toxicity data for 1 species, a fish. There were only acute toxicity data for 3 species, 1 fish, 1 crustacean and 1 green alga. Quite some number of the toxicity data exceeded twice reliable literature values for the aqueous solubility of this chemical. The highest concentration toxicity datum used to derive the TV was 610.

Therefore only a LR (Interim) TV could be derived.

$$\begin{aligned}\text{LR (Interim) TV} &= \text{lowest value} \div 100 \\ &= 133 \mu\text{g/L} \div 100 \\ &= 1.3 \mu\text{g/L} \\ &\approx 1 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (interim) TV was adopted for marine waters.

$$\text{Therefore LR TV} = 1 \mu\text{g/L}$$

## **Acetonitrile [CAS No. 75-05-8]**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic toxicity data and only acute toxicity data for 1 species.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest acute value} \div 1000 \\ &= 160\,000 \mu\text{g/L} \div 1000 \\ &= 160 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no marine toxicity data for this chemical. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 160 \mu\text{g/L}$$

## **Acrylonitrile [CAS No. 107-13-1]**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic toxicity data. There were only acute toxicity data for 9 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 7600 \mu\text{g/L} \div 1000 \\ &= 7.6 \mu\text{g/L}\end{aligned}$$

Which was rounded up to 8  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 8 \mu\text{g/L}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

LR (ECL) TV = 8 µg/L

## Poly(acrylonitrile-co-butadiene-co-styrene) [CAS No. 9003-56-9]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

13900	14215.10	19364.92	19500	19933.11
34484.25	7600	32000	12804.75	34000
29786.39	8717.80	34200	7883.74	

HC1 50%	=	2026.74
HC5 50%	=	5259.74
HC10 50%	=	7931.14
HC20 50%	=	11961.35

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (crustaceans) was 10.

MR TV =  $5259.74 \div 10 = 525.97 = 525 \mu\text{g/L}$

The other levels of protection are:

99%	95%	90%	80%
202.674	525.97	793.114	1196.135

These were rounded off to

200	530	800	1200 µg/L
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## Marine

### Fails HR

#### MR Calculations

The data used to derive the TV were:

2900	3349.63	3546.83	6855.65	13057.56	20000
3098.39	6993.57	11618.95	14124.45	3200	3400

HC1 50%	=	1963.62
HC5 50%	=	2461.12
HC10 50%	=	2825.88
HC20 50%	=	3410.69

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (crustaceans) was 10.

MR TV =  $2461.12 \div 10 = 246.1 = 245 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
196.362	246.112	282.588	341.069

These were rounded off to

200	250	280	340 µg/L
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## **Dimethylformamide [CAS No. 68-12-2]**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic toxicity data and only acute toxicity data for 9 species belonging to 3 different taxonomic groups (fish, crustacea and insects).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1000000 \mu\text{g/L} \div 1000 \\ &= 1000 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 1000 \mu\text{g/L}$$

## **1,2-diphenylhydrazine [CAS No. 122-66-7]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species, a crustacean

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2180 \mu\text{g/L} \div 1000 \\ &= 2.2 \mu\text{g/L} \\ &\approx 2 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 2 \mu\text{g/L}$$

## Diphenylnitrosamine [CAS No. 86-30-6]

### Freshwater

#### Fails HR and MR

There were no chronic toxicity data and only acute toxicity data for 2 species, a fish and a crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 5800 \mu\text{g/L} \div 1000 \\ &= 5.8 \mu\text{g/L} \\ &\approx 6 \mu\text{g/L}\end{aligned}$$

### Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 6 \mu\text{g/L}$$

## Hexachlorobutadiene [CAS No. 87-68-3]

### Freshwater

#### Fails HR and MR

There were no chronic toxicity data and only acute toxicity data for 1 species, a fish. There was an unscreened chronic toxicity value of 9.3  $\mu\text{g/L}$  for *Pimephales promelas* that was cited in the USEPA water quality guidelines of 1980. This datum was used in the calculation of the LR TV but was not included in the database.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div \text{AF} \\ &= 9.3 \mu\text{g/L} \div 200 \\ &= 0.04 \mu\text{g/L}\end{aligned}$$

An AF of 200 was used as the lowest toxicity value was chronic.

### Marine

#### Fails HR and MR

There were no chronic toxicity data and only acute toxicity data for 2 species, a fish and a crustacean. There was an unscreened acute toxicity value of 32  $\mu\text{g/L}$  for *Pimephales promelas* that was cited in the USEPA water quality guidelines of 1980. This datum was used in the calculation of the LR TV but was not included in the database.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 32 \mu\text{g/L} \div 1000 \\ &= 0.03 \mu\text{g/L}\end{aligned}$$



## **Hexachlorocyclopentadiene [CAS No. 77-47-4]**

### **Freshwater**

#### **Fails HR and MR**

There was only chronic toxicity datum for 1 species (crustacea) and acute data for 1 species (green alga).

Therefore only a LR (ECL) TV could be derived. An AF of 200 was used as the lowest toxicity value was chronic).

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 9 \mu\text{g/L} \div 200 \\ &= 0.045 \mu\text{g/L}\end{aligned}$$

Which was rounded up to 0.05  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 0.05 \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.05 \mu\text{g/L}$$

## **Isophorone [CAS No. 78-59-1]**

### **Freshwater**

#### **Fails HR an MR**

There were no chronic toxicity data and only acute toxicity data for 3 species, 2 fish and 1 crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 120\,000 \mu\text{g/L} \div 1000 \\ &= 120 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were no chronic toxicity data and only acute toxicity data for 3 species, a fish, a crustacean and a diatom.

Therefore only a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 12\,900 \div 100 \\ &= 129 \mu\text{g/L}\end{aligned}$$

This was rounded off to 130  $\mu\text{g/L}$ .

$$\text{Therefore LR (interim) TV} = 130 \mu\text{g/L}$$

## **Aldrin [CAS No. 309-00-2]**

### **Freshwater**

#### **Fails HR and MR**

The available toxicity data included much data that were above the aqueous solubility cut-off of 20 µg/L (ie. twice reliable literature aqueous solubility values). When these data were removed the remaining data no longer meet the minimum requirements of the Burr Type III method and therefore this method could not be used.

There were no chronic data but there was acute toxicity data for 19 species of fish, 11 crustaceans, 6 insects, 1 mollusc and 2 amphibians.

Therefore only a LR (interim) TV could be derived. This could be done as it is a pesticide and not very toxic to plants.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 0.097 \div 100 \\ &= 0.001 \mu\text{g/L} \end{aligned}$$

### **Marine**

#### **Fails HR and MR**

There were chronic toxicity data for 2 species, which belonged to 2 taxonomic groups (fish and mollusca). There were acute toxicity data for 11 species, which belonged to 3 taxonomic groups (fish, crustacea and mollusca).

Therefore only a LR (interim) TV could be derived. This could be done as it is a pesticide and not very toxic to plants.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 0.32 \div 100 \\ &= 0.003 \mu\text{g/L} \end{aligned}$$

## **Chlordane [CAS No. 12789-03-6]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

There was a marked outlier in the dataset (ie. the value of 9731). This data point was removed and the TV calculated using the data below:

27	12	14.49	7.21	6.37	108.15
50.89	3	11.8	24.92	14.49	19.86
9.6	45.33	11.05	60.85	46.43	27.23
40	37.82	50	10.64	4.8	0.4
63.2	20.94	20.76	530.71	970.37	1440
1250	1414.21	360	17	6.4	

$$\begin{aligned} \text{HC1 50\%} &= 0.85 \\ \text{HC5 50\%} &= 2.48 \\ \text{HC10 50\%} &= 4.24 \\ \text{HC20 50\%} &= 8.02 \end{aligned}$$

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 29.88.

$$\text{MR TV (HC1 50\%)} = 0.85 \div 29.88 = 0.028 = 0.03 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because Chlordane can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.028	0.083	0.142	0.268

These were rounded off to

0.03	0.08	0.14	0.27 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were chronic toxicity data for 2 species — a fish and a crustacean. There were only acute data for 12 species, which belonged to 3 taxonomic groups (fish, crustacea and mollusca).

Therefore only a LR (interim) TV could be derived. This could be done as it is a pesticide and not very toxic to plants (ie. Low algal toxicity assumed). An assessment factor of 20 was used as the lowest toxicity value was chronic.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 20 \\ &= 0.015 \div 20 \\ &= 0.00075 \mu\text{g/L} \\ &\approx 0.001 \mu\text{g/L} \end{aligned}$$

The freshwater TV was of higher quality than this and should normally have been adopted for marine waters.

$$\text{LR TV (HC1 50\%)} = 0.85 \div 29.88 = 0.028 = 0.03 \mu\text{g/L}$$

The HC1 50% would have been adopted for slight to moderately modified ecosystem protection because Chlordane can bioaccumulate.

The other levels of protection would be:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.028	0.083	0.142	0.268

These were rounded off to

0.03	0.08	0.14	0.27 $\mu\text{g/L}$
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However, neither the HC5 50% TV nor the HC1 50% TV provided adequate protection to 1 out of 2 species for which there was chronic toxicity data. Therefore the marine LR (interim) TV was adopted.

$$\text{LR (interim) TV} = 0.001 \mu\text{g/L}$$

## DDE [CAS No. 72-55-9]

### Freshwater

#### Fails HR and MR

There were no chronic toxicity data and only acute toxicity data for 4 species, which belonged to 2 taxonomic groups (fish and platyhelmenthes).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 32 \mu\text{g/L} \div 1000 \\ &= 0.032 \mu\text{g/L}\end{aligned}$$

This was rounded down to 0.03  $\mu\text{g/L}$ .

$$\text{Therefore LR (ECL) TV} = 0.03 \mu\text{g/L}$$

### Marine

There were chronic toxicity data for 1 species a crustacean. There were acute toxicity data for 3 species, which belong to 2 taxonomic groups (crustacea and mollusca).

Therefore only a LR (ECL) TV could be derived. An AF of 200 was used as the lowest toxicity value was chronic.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 200 \\ &= 0.1 \mu\text{g/L} \div 200 \\ &= 0.0005 \mu\text{g/L}\end{aligned}$$

## DDT [CAS No. 50-29-3]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

14.16	122.8	16.85	3.97	38.68	2.31
13.87	34.10	4.95	12.78	8.89	6.00
8.66	1.53	3.93	15.56	7.22	11.5
40.59	2.84	18.94	5.60	1.8	1.8
3.65	2.9	10.67	123.29	15.56	4.16
945.46	1.04	15	0.88	0.84	1.66
2.08	5.35	3.76	74.98	28	2.65
5.8	59.53	17	7.4	23	1
3.5	1.2	1.2	20	32	1.5
1.9	134.76	1.6	30	3162.41	6400
2277	8700	20845	15000	4624.93	6400

HC1 50%	=	0.41
HC5 50%	=	0.87
HC10 50%	=	1.37
HC20 50%	=	2.55

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 70.85.

$$\text{MR TV (HC1 50\%)} = 0.41 \div 70.85 = 0.00578 = 0.006 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because DDT can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00578	0.0123	0.0193	0.0360

These were rounded off to

0.006	0.01	0.02	0.04 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute toxicity data for 20 species that belonged to 3 different taxonomic groups (fish, crustacea and mollusca). As DDT is a pesticide it will most probably be relatively non-toxic to alga. The data therefore, meets the minimum data requirements for the LR (interim) TV.

$$\begin{aligned} \text{MR (AF) TV} &= \text{lowest value} \div 100 \text{ or } \text{ACR} \times 10 \\ &= 0.26 \div (70.85 \times 10) \\ &= 0.0004 \mu\text{g/L} \end{aligned}$$

## **Dicofol [CAS No. 115-32-2] Freshwater Fails HR and MR**

There were no chronic toxicity data but acute toxicity data for 18 species which belonged to 3 different taxonomic groups (fish, insecta and mollusca).

As dicofol is a pesticide a LR (interim) TV guideline could be derived (because it would be relatively non-toxic to alga).

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 53 \mu\text{g/L} \div 100 \\ &= 0.53 \mu\text{g/L} \end{aligned}$$

Which was rounded off to 0.5  $\mu\text{g/L}$

$$\text{Therefore LR (interim) TV} = 0.5 \mu\text{g/L} .$$

## **Marine**

There were no chronic toxicity data and only acute toxicity data for 3 species which all were crustaceans.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 138 \mu\text{g/L} \div 1000 \\ &= 0.138 \\ &\approx 0.1 \mu\text{g/L} \end{aligned}$$

## **Dieldrin [CAS No. 60-57-1]**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic toxicity data. There were toxicity data for 16 species that belonged to 3 taxonomic groups (fish, crustacea and insecta).

As dieldrin is a pesticide a LR (interim) TV guideline could be derived (because it would be relatively non-toxic to alga).

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div (10 \times \text{ACR}) \\ &= 0.58 \mu\text{g/L} \div (10 \times 6.164) \\ &= 0.0094 \mu\text{g/L} \\ &\approx 0.01 \mu\text{g/L} \end{aligned}$$

### **Marine**

#### **Fails HR and MR**

There were no chronic toxicity data. There were acute toxicity data for 9 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div (10 \times 10 \times \text{ACR}) \\ &= 0.4 \mu\text{g/L} \div (100 \times 6.164) \\ &= 0.0006 \mu\text{g/L} \\ &\approx 0.001 \mu\text{g/L} \end{aligned}$$

However, the freshwater LR (interim) TV was of better quality and was therefore adopted for marine waters.

$$\text{LR (interim) TV} = 0.01 \mu\text{g/L}$$

## **Endosulfan [CAS No. 115-29-7]**

### **Freshwater**

#### **HR calculations**

The data used to derive the TV were:

700	100	2.7	0.2	10	20	6.79
HC1 50%	=	0.0288				
HC5 50%	=	0.238				
HC10 50%	=	0.630				
HC20 50%	=	1.842				

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV.

$$\text{HR TV (HC1 50\%)} = 0.029 = 0.03 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because endosulfan can bioaccumulate and the HC5 50% did not provide adequate protection from even acute toxicity.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0288	0.238	0.63	1.842

These were rounded off to

0.03	0.2	0.6	1.8 µg/L
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## **Marine Fails HR MR calculations**

The data used to derive the TV were:

1.3	1.1	1.38	1.15	0.3	0.26	1.5	0.1
1.55	0.6	2.1	0.14	19	15	0.50	
0.98	0.69	0.24	0.04	0.28	17.73	261.08	
17.38	65	52.25	15.37	16.01	1.96	1082.13	
196.60							

HC1 50%	=	0.0397
HC5 50%	=	0.0954
HC10 50%	=	0.163
HC20 50%	=	0.339

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV (HC1 50\%)} = 0.0397 \div 7.295 = 0.0054 = 0.005 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because endosulfan can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.005440713	0.01307608	0.022357779	0.046470185

These were rounded off to

0.005	0.01	0.02	0.05 µg/L
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## **Alpha-endosulfan [CAS No. 959-98-8] Freshwater Fails HR and MR**

There were no chronic toxicity data. There were acute toxicity data for 4 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 0.16 \div 1000 \\
&= 0.00016 \\
&\approx 0.0002 \mu\text{g/L}
\end{aligned}$$

## Marine

### Fails HR and MR

There were no toxicity data for marine organisms. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR TV} = 0.0002 \mu\text{g/L}$$

## Beta-endosulfan [CAS No. 33213-65-9]

### Freshwater

#### Fails HR and MR

There were no chronic toxicity data. There were acute toxicity data for 4 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 6.6 \div 1000 \\
&= 0.0066 \mu\text{g/L} \\
&\approx 0.007 \mu\text{g/L}
\end{aligned}$$

## Marine

### Fails HR and MR

There were no toxicity data for marine organisms. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR TV} = 0.007 \mu\text{g/L}$$

## Endrin [CAS No. 72-20-8]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

0.70	0.98	6.72	4.30	1.58	0.55
0.45	0.57	0.85	0.83	0.95	0.14
0.53	1.05	1.2	0.15	1.14	0.46
1.62	1.5	1.8	3.7	3	2.95
0.35	4.6	0.9	0.34	0.44	2.3
0.72	1.22	0.76	2.51	0.40	6.34
24	27.50	20	14.85	32.03	62
12	10	56	18	10	120
180	228.47	34	3178.63	20	

$$\begin{aligned}
\text{HC1 50\%} &= 0.12 \\
\text{HC5 50\%} &= 0.24
\end{aligned}$$



HC10 50% = 0.37  
 HC20 50% = 0.64

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 5.79.

$$\text{MR TV (HC1 50\%)} = 0.12 \div 5.79 = 0.0207 = 0.02 \mu\text{g/L}$$

However, this figure did not provide an adequate margin of safety for acute toxicity to several species and the default ACR of 10 was used instead.

$$\text{MR TV (HC1 50\%)} = 0.12 \div 10 = 0.012 = 0.01 \mu\text{g/L}$$

The HC1 50% was adopted because endrin can bioaccumulate.

This TV did not provide adequate protection even against acute toxicity. Therefore the default AF of 10 was used to derive the TV rather than the ACR.

$$\text{MR TV (HC1 50\%)} = 0.1236 \div 10 = 0.01236 = 0.01 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because endrin can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.012	0.024	0.037	0.064

These were rounded off to

0.01	0.02	0.04	0.06
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## **Marine Fails HR MR Calculations**

The data used to derive the TV were:

0.60	0.39	0.39	0.92	0.40	0.30
0.31	1.29	0.48	0.06	1.3	0.09
0.32	2.60	1.2	0.63	3.1	0.17
15	2	1.05	0.4	6.38	0.65
2.78	0.2	0.04	65.71	360	

HC1 50%	=	0.0363
HC5 50%	=	0.0775
HC10 50%	=	0.119
HC20 50%	=	0.2079

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 5.79.

MR TV (HC1 50%) = 0.0363 ÷ 5.79 = 0.0063 = 0.006 μg/L. However, this did not provide an adequate margin of safety for acute toxicity and the default ACR of 10 was used.

$$\text{MR TV (HC1 50\%)} = 0.0363 \div 10 = 0.00363 = 0.004 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because endrin can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00363	0.00775	0.0119	0.02079

These were rounded off to

0.004	0.008	0.01	0.02 $\mu\text{g/L}$
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## Heptachlor [CAS No. 76-44-8]

### Freshwater

### Fails HR

### MR Calculations

The data used to derive the TV were:

63	185	6.20	161.72	163.71	19.55
17.88	10	13.53	17	30.94	42
44.13	39.52	1.97	1.8	53.68	2.8
0.9	1.1	32.78			

HC1 50%	=	0.063
HC5 50%	=	0.67
HC10 50%	=	1.87
HC20 50%	=	5.23

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (fish) was 7.5.

$$\text{MR TV (HC1 50\%)} = 0.063 \div 7.5 (\text{ACR}) = 0.0084 = 0.01 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because heptachlor can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0084	0.089	0.249	0.697

These were rounded off to

0.01	0.09	0.25	0.7 $\mu\text{g/L}$
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## Marine Fails HR and MR

There was 1 chronic toxicity datum, which was for a crustacean. There were acute toxicity data for 15 species, which belonged to 3 taxonomic groups (fish, crustacea and mollusca).

As heptachlor is a pesticide a LR (interim) TV guideline could be derived (because it would have relatively low toxicity to alga).

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div (10 \times \text{ACR}) \\ &= 0.03 \mu\text{g/L} \div (10 \times 7.5) \\ &= 0.0004 \mu\text{g/L} \end{aligned}$$

The freshwater TV was of higher quality than the TV for marine waters and would normally be adopted for marine waters. However, it did not provide adequate protection against acute toxicity for 1 species of crustacean and marginal protection for another. Therefore the marine LR(interim) TV was adopted.

$$\text{LR (interim) TV} = 0.0004 \mu\text{g/L}$$

## Lindane [CAS No. 58-89-9]

### Freshwater HR Calculations

There were chronic toxicity data for *Jordanella floridae* but these were not used to derive the TV as they were greater than the aqueous solubility cut-off of 34 000  $\mu\text{g/L}$  (ie. twice reliable literature values for aqueous solubility).

The data used to derive the TV were:

150	2.67	12	55	1264.99
1400	634.51			

$$\begin{aligned} \text{HC1 50\%} &= 0.0171 \\ \text{HC5 50\%} &= 0.859 \\ \text{HC10 50\%} &= 4.64 \\ \text{HC20 50\%} &= 25.07 \end{aligned}$$

$$\text{HR TV (HC5 50\%)} = 0.86 = 0.9 \mu\text{g/L}$$

### MR Calculations:

However, this TV did not provide adequate protection from even acute toxicity. So a MR TV was derived using acute toxicity data.

64	650	321.61	473.10	10069.76	1.5
114.08	146.19	131.94	19.5	25.71	196.15
524.63	507.17	73.5	1012.87	184.39	146.20
432.03	153.78	84.12	32	7.3	116.65
38.78	32.78	274.28	51.86	77.35	58.13
9.13	29.07	461.50	141.97	38.16	375
10	1100	3.2	904.7	460	13.38
75.63	8.62	619.67	5.02	27.26	19.17
207	330	150	9.6	130	3.08
3.9	2685	2331	6233	2545.58	2500
3200	5210.9	1773.41			

HC1 50%	=	0.671
HC5 50%	=	4.14
HC10 50%	=	9.58
HC20 50%	=	24.27

$$\text{MR TV (HC5 50\%)} = 4.14 \div 25.10 \text{ (ACR)} = 0.164 \approx 0.2 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0671	0.165	0.3817	0.977

These were rounded off to

0.07	0.2	0.4	1 $\mu\text{g/L}$
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## Marine

### Fails HR

### MR Calculations

There were no chronic data for marine species. There were acute toxicity data for 14 species that belonged to 3 taxonomic groups (fish, crustacea and mollusca). Lindane is a pesticide and is therefore likely to have relatively low toxicity to plants and algae. Therefore, a LR (interim) TV could be derived for Lindane using an AF of 100.

Therefore only a LR (interim) TV could be derived.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 0.66 \mu\text{g/L} \div 100 \\ &= 0.0066 \mu\text{g/L} \\ &\approx 0.007 \mu\text{g/L} \end{aligned}$$

## Methoxychlor [CAS No. 72-43-5]

### Freshwater

### Fails HR and MR

There were only acute toxicity data for 28 species, which belonged to 3 taxonomic groups (fish, crustacea and insecta). Methoxychlor is a pesticide therefore a LR (interim) TV does not require alga toxicity data.

Therefore only a LR (interim) TV could be derived.

$$\begin{aligned} \text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 0.5 \mu\text{g/L} \div 100 \\ &= 0.005 \mu\text{g/L} \end{aligned}$$

## Marine

There were no chronic toxicity data and only acute toxicity data for 21 species, which belonged to 3 taxonomic groups (fish, crustacea and mollusca).

Therefore Can derive an LR (interim) TV.

$$\begin{aligned}
\text{LR (interim) TV} &= \text{lowest value} \div 100 \\
&= 0.42 \mu\text{g/L} \div 100 \\
&= 0.0042 \mu\text{g/L}
\end{aligned}$$

This was rounded off to 0.004  $\mu\text{g/L}$

$$\text{Therefore LR (interim) TV} = 0.004 \mu\text{g/L}$$

## **Mirex [CAS No. 2385-85-5]**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic data. There were acute toxicity data for 4 species, which belonged to 3 taxonomic groups (crustacea, insecta and hydra).

Therefore a LR (ECL) TV could be derived.

$$\begin{aligned}
\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
&= 40 \mu\text{g/L} \div 1000 \\
&= 0.04 \mu\text{g/L}
\end{aligned}$$

### **Marine**

#### **Fails HR and MR**

There were no toxicity data for marine organisms. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR TV} = 0.04 \mu\text{g/L}$$

## **Toxaphene [CAS No. 8001-35-2]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

5.54	28.92	9.39	16.94	8.10	10.32
13	3.90	2	5.59	9.12	7.10
12	11.13	3.05	18.55	1.4	10.42
10.92	17.61	24	15.34	40	73.48
1.76	3.33	18	740	380	76
107.83	34	115.12	195		

HC1 50%	=	1.16
HC5 50%	=	2.17
HC10 50%	=	3.10
HC20 50%	=	4.91

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 9.80.

$$\text{MR TV (HC1 50\%)} = 1.16 \div 9.80 = 0.0118 = 0.1 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because toxaphene can bioaccumulate.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.118367347	0.221428571	0.316326531	0.5

These were rounded off to

0.1	0.2	0.3	0.5 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data. There were acute toxicity data for 13 species, which belonged to 3 taxonomic groups (fish, crustacea and mollusca). As toxaphene is a pesticide a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div (10 \times \text{ACR}) \\ &= 0.054 \div (10 \times 8.65) \\ &= 0.0006 \mu\text{g/L}\end{aligned}$$

The freshwater TV was of higher quality than the TV for marine waters and would normally be adopted for marine waters. However, it did not provide adequate protection against acute toxicity for 1 species of crustacean. Therefore the marine LR(interim) TV was adopted.

$$\text{LR (interim) TV} = 0.0006 \mu\text{g/L}$$

## **Guthion (azinphosmethyl) [CAS No. 86-50-0]**

### **Freshwater**

#### **Fails HR**

#### **MR calculations**

The data used to derive the TV were:

3500	2107.32	695	0.36	3272.36	52
13.41	4.87	6.32	6.83	8.52	268.42
3.0	2.1	4.01	6.22	21.0	1.57
0.15	0.29	0.46	56	0.37	12.28
11.21	899.91				

$$\begin{aligned}\text{HC1 50\%} &= 0.089 \\ \text{HC5 50\%} &= 0.25 \\ \text{HC10 50\%} &= 0.47 \\ \text{HC20 50\%} &= 1.12\end{aligned}$$

Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 0.25 \div 10 = 0.025 = 0.025 \mu\text{g/L}$$

However, this TV was too close to the acute data and therefore did not provide adequate protection. Therefore, the HC1 50% was adopted as the MR TV.

$$\text{MR TV} = 0.089 \div 10 = 0.0089 = 0.009 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0089	0.025	0.047	0.112

These were rounded off to

0.01	0.02	0.05	0.1 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data. There were acute toxicity data for 5 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore, only a LR (ECL) TV could be derived. However, the freshwater TV was of better quality and therefore was adopted for marine waters.

$$\text{LR TV (HC1 50\%)} = 0.025 \text{ µg/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the difference between the TV and the most sensitive acute toxicity data was not deemed to be adequate (i.e. < 3).

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0089	0.025	0.047	0.112

These were rounded off to

0.01	0.02	0.05	0.1 µg/L
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## **Chlorpyrifos [CAS No. 2921-88-2] Freshwater HR Calculations**

The data used to derive the TV were:

0.57	0.075	0.065	0.5	200
10	100	100	100	10
100	330			

HC1 50%	=	0.00004369
HC5 50%	=	0.01067
HC10 50%	=	0.1139
HC20 50%	=	1.216

$$\text{HR TV (HC5 50\%)} = 0.0107 = 0.01 \text{ µg/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00004369	0.01067	0.1139	1.216

These were rounded off to

0.00004	0.01	0.11	1.2 µg/L
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## **Marine HR Calculations**

The data used to derive the TV were:

0.25	0.75	0.28	0.38	1.4	0.003	2000	10000	10000	600
150	2000								

HC1 50%	=	0.00049
HC5 50%	=	0.0089
HC10 50%	=	0.040
HC20 50%	=	0.26

$$\text{HR TV (HC1 50\%)} = 0.00049 = 0.0005 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00049	0.0089	0.04	0.26

These were rounded off to

0.0005	0.009	0.04	0.3 µg/L
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## **Demeton-S [CAS No. 8065-48-3] Freshwater Fails HR and MR**

There were only acute toxicity data for 4 species which belonged to 1 taxonomic group (fish).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 40 \mu\text{g/L} \div 1000 \\ &= 0.04 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were only toxicity data for 2 marine species, which belonged to 2 different taxonomic groups (fish and mollusca).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\therefore \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 320 \mu\text{g/L} \div 1000 \\ &= 0.32 \mu\text{g/L} \\ &= 0.3 \mu\text{g/L}\end{aligned}$$



## Demeton-S-methyl [CAS No. 919-86-8]

### Freshwater

#### Fails HR and MR

There were only acute toxicity data for 4 species which belonged to 1 taxonomic group, mollusca.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 3700 \mu\text{g/L} \div 1000 \\ &= 3.7 \mu\text{g/L}\end{aligned}$$

This was rounded to 4  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 4 \mu\text{g/L}$$

### Marine

There were no toxicity data for marine species. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 4 \mu\text{g/L}$$

## Diazinon [CAS No. 333-41-5]

### Freshwater

#### Fails HR

#### MR calculations

The data used to derive the TV were:

1897.37	6160	21	250	0.46	1.1
0.65	0.2	237.96	2.88	11.97	537
1.52	3200	8000	94.12	2800	6328.77
3584.65	7935.17	7354.13	642.24	3186.77	1273
2461.80	8000	1628.65	171.43	224.07	2354.06
515.93	6472.57	2165.46	602	734.51	1492.5
83.50	36.33	0.22	7.8	50	140
79.43	37.00	16000	11000	20000	4800
2500	48	9500	11000		

HC1 50%	=	0.00058
HC5 50%	=	0.21
HC10 50%	=	2.74
HC20 50%	=	34.96

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species for which data were available was 17.5.

$$\text{MR TV (HC5 50\%)} = 0.21 \div 17.5 = 0.012 = 0.01 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3.31E-05	0.012	0.156	1.998

These were rounded off to

0.00003	0.01	0.2	2 $\mu\text{g/L}$
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## Marine Fails HR and MR

There were no chronic toxicity data and only acute toxicity data for 2 species, which belonged to 1 taxonomic group (crustacea).

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of a higher quality than this and therefore it was adopted for marine waters.

LR TV (HC5 50%) = 0.01 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3.31E-05	0.012	0.156	1.998

These were rounded off to

0.00003	0.01	0.2	2 µg/L
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## Dimethoate [CAS No. 60-51-5] Freshwater Fails HR MR Calculations

The data used to derive the TV were:

4 784	30 431.1	10 500	10 100	65	4 650
8 851.26	10 200	6 546.82	2.3	22 000	7 327.59
117 716.84	42 569.97	29 853.35	5.20	2	2.6
1 074.87	237.84	2.2	3 016.15	68.95	3.10
2.9	24.5	35.8	5 358	407 524.24	7.82

The above data that would normally have been used to derive the MR TV. However, the data had a marked bi-modal distribution. Therefore, only the data that belonged to the more sensitive group (shown below) were used to derive the MR TV.

65	2.3	5.20	2	2.6	2.2
68.95	3.10	2.9	24.5	35.8	7.82

HC1 50%	=	0.96
HC5 50%	=	1.44
HC10 50%	=	1.86
HC20 50%	=	2.62

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

MR TV = 1.44 ÷ 10 = 0.144 = 0.15 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.096	0.144	0.186	0.262

These were rounded off to

0.1	0.15	0.2	0.3 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute toxicity data for 4 species that belonged to 2 taxonomic groups (fish and diatoms).

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

LR TV = 0.15 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.096	0.144	0.186	0.262

These were rounded off to

0.1	0.15	0.2	0.3 µg/L
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## **Fenitrothion [CAS No. 122-14-5]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The acute toxicity data that would normally have been used to derive the MR TV had a marked bi-modal distribution. Therefore, only the data that belonged to the more sensitive group (shown below) were used to derive the MR TV. Despite this all the acute toxicity data are in the database.

203.28	7.96	2.70	18	11.40	8.85	3
4.43	0.92	2.08	37.76	35.16	269	346.41
1.77	1.5	1.6	3.22	4.21	6.14	21
89.64	61.85	55	39	5.87	6.36	177.51
82	148	9.27	11.03	10.27	17.94	800

HC1 50%	=	0.769
HC5 50%	=	1.438
HC10 50%	=	2.109
HC20 50%	=	3.552

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (algae) was 8.

MR TV =  $1.438 \div 8 = 0.179 = 0.18 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0960875	0.17975	0.263625	0.444

These were rounded off to

0.1	0.2	0.3	0.4 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data. However, there were acute toxicity data for 14 species that belonged to 3 taxonomic groups (fish, crustacea and mollusca).

As there were 3 taxonomic groups and Fenitrothion is a pesticide then toxicity data for plants was not required to derive a LR (interim) TV.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 0.1 \mu\text{g/L} \div 100 \\ &= 0.001 \mu\text{g/L}\end{aligned}$$

The freshwater TV was of higher quality than the marine TV and would therefore, normally be adopted for marine waters. Given the high sensitivity of the lobster (0.1 µg/L) it was preferable to derive a low reliability TV using a high AF than to adopt the FW figure. Low algal toxicity was assumed, allowing for use of an AF of 100.

$$\text{LR TV} = 0.001 \mu\text{g/L}$$

## **Malathion [CAS No. 121-75-5] Freshwater Fails HR MR Calculations**

The data used to derive the TV were:

7523.79	8178.59	14163.22	1420	4594	13290.14
269.49	51.94	77	311.61	166.77	76.96
263	14173.40	1376.94	455	6000	4100
126.83	76	64	1007.47	2259.69	16200
2	1.75	2	2	1	1457.02
117.446	7862.22	37.80	4.23	15.13	1.94
39.98	49.80	126270	12445.88	31.1	37.40
2449.40	29933.26	0.61			

HC1 50%	=	0.032
HC5 50%	=	0.89
HC10 50%	=	3.96
HC20 50%	=	19.75

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (fish) was 17.46.

$$\text{MR TV} = 0.89 \div 17.46 = 0.0510 = 0.05 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00183	0.051	0.227	1.131

These were rounded off to

0.002	0.05	0.2	1.1 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute data for 4 species that belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

$$\text{LR TV} = 0.05 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00183	0.051	0.227	1.131

These were rounded off to

0.002	0.05	0.2	1.1 µg/L
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## **Parathion [CAS No. 56-38-2] Freshwater Fails HR MR Calculations**

The data used to derive the TV were:

5640	2104.81	271.93	28896.18	2957.19	305.18
262.43	699.60	4900	2946.65	2081.0	1495.44
1799.65	1920	18.67	648.09	0.23	0.85
0.6	1.19	5.90	0.04	1.5	0.43
2.2	3.37	7.25	2.89	64.69	1.99
2.23	1.1	15	6.84	5.10	4.62
19.55	7.14	29	7079.30	22313.44	7100
2900	15000	4624.93	20845.12		

HC1 50%	=	0.050
HC5 50%	=	0.28
HC10 50%	=	0.73
HC20 50%	=	2.64

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 71.2.

$$\text{MR TV} = 0.276 \div 71.21 = 0.0038 = 0.004 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00070	0.0039	0.010	0.037

These were rounded off to

0.0007	0.004	0.01	0.04 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute toxicity data for 2 species — a fish and an annelid.

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

$$\text{LR TV} = 0.004 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00070	0.0039	0.010	0.037

These were rounded off to

0.0007	0.004	0.01	0.04 µg/L
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## **Profenofos [CAS No. 41198-08-7] Freshwater Fails HR and MR**

There were chronic toxicity data for 2 species — a crustacean and a green alga. There were only acute toxicity data for 8 species, 6 fish and 2 crustaceans.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 21 \mu\text{g/L} \div 1000 \\ &= 0.02 \mu\text{g/L}\end{aligned}$$

The toxicity value of 21 was used as the crustacean toxicity data although lower had not been published.

## **Marine**

There were no chronic toxicity data and only acute toxicity data for 2 species, both crustaceans.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 2.4 \div 1000 \\ &= 0.002 \mu\text{g/L}\end{aligned}$$

## Temephos [CAS No. 3383-96-8]

### Freshwater

#### Fails HR and MR

There were no chronic toxicity data and only acute data for 30 species that belonged to 3 taxonomic groups (fish, crustacea and insecta).

As there were toxicity data for 3 taxonomic groups and Temephos is a pesticide, toxicity data for alga were not required to derive a LR (interim) TV.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 100 \\ &= 8 \div 100 \\ &= 0.08 \mu\text{g/L} \end{aligned}$$

NOTE: The value of 8 used to derive the TV was not the lowest. The lowest value was of 0.092 for a mosquito — one of the target organisms of the pesticide. Therefore toxicity data for that type of organism were not used to derive the TV.

However, the TV for marine waters was of higher quality than that for freshwater and therefore it was adopted for freshwaters.

$$\text{LR TV} = 0.05 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00036	0.051	0.428	3.626

These were rounded off for

0.0004	0.05	0.4	3.6
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### Marine

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

7500	1200	5037.9	40	11400	1000
23	600	320	130	3000	45
4100	10	8.58	1	45	8
58000	8600	1500			

HC1 50%	=	0.0036
HC5 50%	=	0.51
HC10 50%	=	4.28
HC20 50%	=	36.26

NOTE: Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 0.51 \div 10 = 0.051 = 0.05 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00036	0.051	0.428	3.626

These were rounded off for

0.0004	0.05	0.4	3.6
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## **Carbofuran [CAS No. 1563-66-2]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

908.45	7900	5100	268.63	1105.44	1045.87
604.33	570.18	248.66	4800	164.92	269.74
193.16	353.67	1442	530	633.54	176.15
1106.72	3400	424.40	162.66	893.54	309.84
0.33	2.45	64.29	35	157.3	46052.16
1.56	4.6	500	56	3808	5294
15874.51	20020.92	22308.89	204480		

HC1 50%	=	0.31
HC5 50%	=	5.73
HC10 50%	=	20.39
HC20 50%	=	75.12

Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 4.901.

$$\text{MR TV} = 5.73 \div 4.901 = 1.169 = 1.2 \mu\text{g/L}$$

The above TV did not provide adequate protection from acute toxicity to crustaceans, therefore, the default ACR, of 10, was then used to derive the MR TV. However, this also did not reduce the MR TV so that it was below the LC<sub>50</sub> for the most sensitive crustacean species.

Therefore the HC1 50% and the ACR was used to derive the MR TV.

$$\text{MR TV} = 0.31 \div 4.901 = 0.06325 = 0.06 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0633	1.169	4.160	15.327

These were rounded off to

0.06	1.2	4	15 $\mu\text{g/L}$
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## Marine Fails HR and MR

There were chronic toxicity data for only 2 species — a fish and a crustacean. There were acute data for 5 species that belonged to 2 taxonomic groups (fish and crustaceans).

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality and therefore was adopted for marine waters.

LR TV = 0.06 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0633	1.169	4.160	15.327

These were rounded off to

0.06	1.2	4	15 µg/L
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## Methomyl [CAS No. 16752-77-5]

There were a number of methomyl toxicity data which did not state the type of media that was used (ie. freshwater or marine). These data were not used to derive TVs.

## Freshwater Fails HR MR Calculations

The data used to derive the TV were:

1700	1892.51	366.97	863.72	974.68	750
4050	1516.49	1983.04	1013.16	1590.83	1291.05
190	220	37.05	886.01	760	32
60	29	1100	870	6600	18000
12000					

HC1 50%	=	4.54
HC5 50%	=	34.25
HC10 50%	=	92.64
HC20 50%	=	234.19

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR for this chemical.

MR TV =  $34.25 \div 10 = 3.425 = 3.5 \mu\text{g/L}$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.454	3.425	9.264	23.419

These were rounded off to

0.5	3.5	9.5	23 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute data for 10 species which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality and therefore was adopted for marine waters.

$$\text{LR TV} = 3.5 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.454	3.425	9.264	23.419

These were rounded off to

0.5	3.5	9.5	23 $\mu\text{g/L}$
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## **S-methoprene [CAS No. 40596-69-8] Freshwater Fails HR and MR**

There were only chronic toxicity data for 1 species — a fish. There were acute data for 6 species which belonged to 3 taxonomic groups (fish, crustacea and mollusca).

As there were data for 3 taxonomic groups and S-methoprene is a pesticide with a specific mode of action, toxicity data for alga were not needed to derive a LR (interim) TV.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 20 \div 100 \\ &= 0.2 \mu\text{g/L}\end{aligned}$$

## **Marine Fails HR and MR**

There were no chronic toxicity data and only acute data for 4 species that belonged to 2 taxonomic groups (fish and crustacea). As S-methoprene is a pesticide it was expected to have relatively low toxicity to plants and therefore a LR (interim) TV could be derived without algae.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 2000 \mu\text{g/L} \div 100 \\ &= 20 \mu\text{g/L}\end{aligned}$$

## **Deltamethrin [CAS No. 52918-63-5] Freshwater Fails HR and MR**

There were no chronic toxicity data. There were only acute toxicity data for 7 species, 3 fish, 1 crustacean, 1 insect and 2 molluscs. However, some of these exceeded two times reliable literature values for the aqueous solubility (ie. 8  $\mu\text{g/L}$ ). The remaining acute toxicity data consisted of 1 fish, 1 crustacean, and 1 insect.

Therefore only an LR (Interim) TV could be derived.

$$\begin{aligned} \text{LR (Interim) TV} &= \text{lowest value} \div 100 \\ &= 0.01 \mu\text{g/L} \div 100 \\ &= 0.0001 \mu\text{g/L} \end{aligned}$$

NOTE: the lowest value was not used as it was much lower than other data for the same species, and was considered anomalous. Therefore the next lowest value was used.

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted.

$$\text{Therefore LR (ECL) TV} = 0.0001 \mu\text{g/L}$$

## **Esfenvalerate [CAS No.**

### **Freshwater**

#### **Fails HR and MR**

There were insufficient chronic toxicity data to derive a HR TV and there were only acute data for 6 species that belonged to 3 taxonomic groups (fish, crustacea and amphibia).

As there were data for 3 taxonomic groups and Esfenvalerate is a pesticide, toxicity data for alga was not needed to derive a LR (interim) TV.

There were sufficient multiple species toxicity data obtained from mesocosm studies. Therefore, a MS HR TV could be derived.

$$\begin{aligned} \text{HR TV} &= \text{lowest value} \div 10 \\ &= 0.01 \mu\text{g/L} \div 10 \\ &= 0.001 \mu\text{g/L} \end{aligned}$$

## **Marine**

### **Fails HR and MR**

There were no data for marine organisms. Therefore the freshwater MS HR TV was adopted for marine waters.

$$\text{HR TV} = 0.001 \mu\text{g/L}$$

## **Diquat [CAS No. 85-00-7]**

### **Freshwater**

#### **Fails HR**

#### **MR calculations**

The data used to derive the TV were:

89250.57	41402.96	84000	1895799.57	289000
79241.81	10297.72	9055.07	10805.87	56635.98
28500	43899.22	28557.96	16800	20600
54947.91	2051.55	13800	3000	19
19	46600	3400	73	19
42	65			

HC1 50%	=	0.12
HC5 50%	=	13.76
HC10 50%	=	106.10
HC20 50%	=	818.8

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 13.76 \div 10 = 1.376 = 1.4 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.012	1.376	10.61	81.882

These were rounded off to

0.01	1.4	10	80 $\mu\text{g/L}$
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## **Marine Fails HR and MR**

There were no data for marine organisms. Therefore the freshwater LR (interim) TV was adopted for marine waters.

$$\text{LR TV} = 1.4 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.012	1.376	10.61	81.882

These were rounded off to

0.01	1.4	10	80 $\mu\text{g/L}$
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## **Paraquat [CAS No. 1910-42-5] Freshwater Fails HR and MR**

There were no chronic toxicity data. There were acute toxicity for 21 species, which belonged to 3 taxonomic groups (fish, crustacea and amphibia). As Paraquat is a herbicide it must have toxicity data for alga in order to derive an LR (Interim) TV.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 500 \mu\text{g/L} \div 1000 \\ &= 0.5 \mu\text{g/L} \end{aligned}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{Therefore LR (ECL) TV} = 0.5 \mu\text{g/L}$$

## **MCPA [CAS No. 94-74-6]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 8 species, 6 fish, 1 crustacean and 1 insect.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 1440 \mu\text{g/L} \div 1000 \\ &= 1.4 \mu\text{g/L} \end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted.

$$\text{Therefore LR (ECL) TV} = 1.4 \mu\text{g/L}$$

## **2,4-D [CAS No. 94-75-7]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

342484.29	160000	1296382.63	39368.23	83494.73
7000	3800	26061.06	105788.37	92101.27
3100	163033.06	43909.00	70149.98	64000
70913.84	4800	2780000	46692.45	2000000
3100000	6170.90	45000	18063.84	236000
63815.66	17614	144100	2771.28	4900
1850	6538.93	6602.89	117000	224588.51

HC1 50%	=	1392
HC5 50%	=	2911
HC10 50%	=	4572
HC20 50%	=	8454

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (fish) was 10.22.

$$\text{MR TV} = 2911 \div 10.22 = 284.8 = 285 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
136.2035225	284.8336595	447.3581213	827.2015656

These were rounded off to

140	280	450	830 $\mu\text{g/L}$
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## Marine Fails HR and MR

There were no chronic toxicity data and only acute data for 4 species that belonged to 3 taxonomic groups (fish, crustacea and mollusca).

Despite being a herbicide 2,4-D seemed to have very low toxicity to alga. Therefore because there were 3 taxonomic groups a LR (interim) TV could be derived.

$$\begin{aligned}\text{LR (interim) TV} &= \text{lowest value} \div 100 \\ &= 1500 \div 100 \\ &= 15 \mu\text{g/L}\end{aligned}$$

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{LR TV} = 2911 \div 10.22 = 284.8 = 285 \mu\text{g/L}$$

The other levels of protection are:

99%	95%	90%	80%
136.2035225	284.8336595	447.3581213	827.2015656

These were rounded off to

140	280	450	830 $\mu\text{g/L}$
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## 2,4,5-T [CAS No. Freshwater Fails HR MR Calculations

The data used to derive the TV were:

1: 13000	2: 58033.39	3: 105028.63	4: 51672.72	5: 6048.14	6: 2900
7: 34134.33	8: 30651.88	9: 15062.94	10: 23410.03	11: 20652.34	12: 600
13: 1762.10	14: 19400	15: 1000	16: 32823.80	17: 9400	18: 8300
19: 120	20: 88000	21: 5000	22: 2700	23: 118357.07	
24: 112904.87	25: 3297.56				

HC1 50%	=	31.92
HC5 50%	=	359.14
HC10 50%	=	1020
HC20 50%	=	2917

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR for this chemical.

$$\text{MR TV} = 359.14 \div 10 = 35.914 = 36 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3.192	35.914	102	291.7

These were rounded off to

3	36	100	290 µg/L
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## **Marine Fails HR and MR**

There were no toxicity data for marine organisms. Therefore the freshwater MR TV was adopted for marine waters.

$$\text{LR TV} = 36 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
3.192	35.914	102	291.7

These were rounded off to

3	36	100	290 µg/L
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## **Bensulfuron [CAS No. Fresh and Marinewater**

There were no toxicity data. So no TV was derived.

## **Metsulfuron Fresh and Marinewater**

There were no toxicity data. So no TV was derived.

## Molinate [CAS No. 2212-67-1]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

20510	1114.09	17980.36	34000	36879.34	4701.78
9696.97	3535.39	13000	400	430	180
600	673.16	5848.08	2400	5600	8698.11
9263.91	25533.33	461.61	34000	19798.99	

HC1 50%	=	2.82
HC5 50%	=	74.67
HC10 50%	=	306.1
HC20 50%	=	1254

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all freshwater species for which data were available was 21.82.

$$\text{MR TV} = 74.67 \div 21.82 = 3.42 = 3.4 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.129	3.422	14.028	57.470

These were rounded off to

0.1	3.4	14	57 $\mu\text{g/L}$
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### Marine

#### Fails HR and MR

There were chronic data for 1 species — a crustacean. There were acute toxicity data for 2 species — a fish and a mollusc.

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality and therefore was adopted for marine waters.

$$\text{LR TV} = 74.67 \div 21.82 = 3.42 = 3.4 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.129	3.422	14.028	57.470

These were rounded off to

0.1	3.4	14	57 $\mu\text{g/L}$
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## Thiobencarb [CAS No. 28249-77-6]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

1500	890	1510	1016.40	1164	2450
2184.24	1598.08	2540	709.36	1138.06	760
1990	1658.8	510	1200	896.28	3470
2000	1244.98	5800	15000	67069.31	5200
5000	3523.25	23.86			

HC1 50%	=	91.54
HC5 50%	=	270.0
HC10 50%	=	438.4
HC20 50%	=	737.2

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species (crustaceans) was 95.

$$\text{MR TV} = 270 \div 95 = 2.84 = 2.8 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.963578947	2.842105263	4.614736842	7.76

These were rounded off to

1	2.8	4.6	8 $\mu\text{g/L}$
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### Marine

There were chronic toxicity data for 1 crustacean. However, there were acute data for 1 species of fish, 2 crustaceans and 1 diatom. Therefore only an interim TV can be derived.

$$\begin{aligned}\text{Interim TV} &= \text{lowest value} \div 20 \\ &= 3.2 \div 20 \\ &= 0.16 \mu\text{g/L}\end{aligned}$$

An AF of 20 was used as the lowest toxicity value was chronic.

However, the freshwater TV was of higher quality than this and was therefore adopted for marine waters.

$$\text{LR TV} = 270 \div 95 = 2.84 = 2.8 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.963578947	2.842105263	4.614736842	7.76

These were rounded off to

1	2.8	4.6	7.8 $\mu\text{g/L}$
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## Thiram [CAS No. 137-26-8]

### Freshwater

#### Fails HR

#### MR calculations

The data used to derive the TV were:

3700	277.56	9.2	34.64	7.04
7500	0.74	254.95	7500	270
210	283.14	4300	103.17	173.21
5500	1000	16.86		

HC1 50%	=	0.0777
HC5 50%	=	1.88
HC10 50%	=	7.52
HC20 50%	=	31.6

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV (HC1 50\%)} = 0.0777 \div 10 = 0.00777 = 0.01 \mu\text{g/L}$$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the TV did not provide adequate protection from acute toxicity to fish.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00777	0.188	0.752	3.16

These were rounded off to

0.01	0.2	0.8	3.0 $\mu\text{g/L}$
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### Marine

#### Fails HR and MR

There were no toxicity data for marine organisms. Therefore the freshwater TV was adopted for marine waters.

$$\text{LR TV} = 0.01 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.00777	0.188	0.752	3.16

These were rounded off to

0.01	0.2	0.8	3.2 $\mu\text{g/L}$
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## **Amitrole [CAS No. 61-82-5]**

### **Freshwater**

#### **Fails HR and MR**

There were no chronic toxicity data. However, there were acute toxicity data for 7 species, which belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 22,100 \mu\text{g/L} \div 1000 \\ &= 22.1 \mu\text{g/L}\end{aligned}$$

This was rounded off to 22  $\mu\text{g/L}$ .

$$\text{Therefore LR (ECL) TV} = 22 \mu\text{g/L}$$

### **Marine**

There were no toxicity for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{Therefore LR (ECL) TV} = 22 \mu\text{g/L}$$

## **Atrazine [CAS No. 1912-24-9]**

### **Freshwater**

#### **Fails HR**

#### **MR Calculations**

The data used to derive the TV were:

16733.20	91258.05	33778.26	258000	18900	12862.46
33603.16	55497.75	14074.80	63245.55	15000	41324.10
5253.57	5328.16	18300	19302.85	35600	5700
14900	1000	720	48.06	287.21	

This data contained one marked outlier — the value of 258 000. This value was removed and the TV recalculated below.

$$\begin{aligned}\text{HC1 50\%} &= 14.29 \\ \text{HC5 50\%} &= 254.26 \\ \text{HC10 50\%} &= 878.41 \\ \text{HC20 50\%} &= 3035\end{aligned}$$

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. The ACR for all species was 20.21.

$$\text{MR TV} = 254.26 \div 20.21 = 12.58 = 13 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.707	12.581	43.464	150.173

These were rounded off to

0.7	13	45	150 µg/L
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## **Marine Fails HR and MR**

There were chronic toxicity data for 1 species, a crustacean. There were only acute data for 6 species that belonged to 3 taxonomic groups (fish and crustacea). Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div (100 \times \text{ACR}) \\ &= 50 \div (100 \times 20.22) \\ &= 0.0247 \\ &\approx 0.025 \mu\text{g/L}\end{aligned}$$

However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

$$\text{LR TV} = 254.26 \div 20.21 = 12.58 = 13 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.707075705	12.58090054	43.46412667	150.1731816

These were rounded off to

0.7	13	45	150 µg/L
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## **Hexazinone [CAS No. 51235-04-2] Freshwater Fails HR and MR**

There were no chronic toxicity data. There were only acute toxicity data for 8 species all of which were fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 75000 \mu\text{g/L} \div 1000 \\ &= 75 \mu\text{g/L}\end{aligned}$$

## **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine species.

$$\text{Therefore LR (ECL) TV} = 75 \mu\text{g/L}$$

## Simazine

### Freshwater

#### Fails HR

#### MR Calculations

A number of the acute toxicity data for simazine were greater than the maximum acceptable solubility of 7000 µg/L (ie. twice reliable literature aqueous solubility values). These data were removed and those used to derive the TV are presented below.

3535.53	3674.23	331.66	6600	90	3420.51
3100	3440.93	1048.81	3580	1900	2.24

HC1 50%	=	1.99
HC5 50%	=	32.36
HC10 50%	=	107.1
HC20 50%	=	354.5

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 32.36 \div 10 = 3.236 = 3.2 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.2	3.236	10.712	35.453

These were rounded off to

0.2	3.2	11	35 µg/L
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## Marine

### Fails HR and MR

There were no toxicity data for marine organisms. Therefore the freshwater TV was adopted for marine waters.

$$\text{LR TV} = 3.2 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.2	3.236	10.712	35.453

These were rounded off to

0.2	3.2	11	35 µg/L
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## Diuron [CAS No. 330-54-1]

### Freshwater

#### Fails HR and MR

There were only chronic data for 1 species — a fish. There were only acute toxicity data for 23 species belonging to 3 different taxonomic groups (fish, crustacea, insecta).

Therefore only a LR (ECL) TV could be derived. An AF of 200 was used because the lowest value was chronic.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 200 \\
 &= 33.4 \mu\text{g/L} \div 200 \\
 &= 0.15 \\
 &\approx 0.2 \mu\text{g/L}
 \end{aligned}$$

## Marine

There were no chronic data but there were acute toxicity data for 2 species, which belonged to 2 taxonomic groups (fish, mollusca).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 1800 \mu\text{g/L} \div 1000 \\
 &= 1.8 \mu\text{g/L}
 \end{aligned}$$

## Tebuthiuron [CAS No. 34014-18-1]

### Freshwater

#### HR Calculations

The data used to derive the TV were:

26000	9300	21800	21.52	56	310
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HC1 50%	=	0.151
HC5 50%	=	2.20
HC10 50%	=	18.79
HC20 50%	=	160.6

$$\text{HR TV} = 2.20 = 2.2 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0151	2.2	18.79	160.6

These were rounded off to

0.02	2.2	20	160 $\mu\text{g/L}$
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## Marine

### Fails HR and MR

There was a chronic datum for 1 species — a diatom. There was an acute datum for 1 species — a crustacean.

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

$$\text{LR TV} = 2.20 = 2.2 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
0.0151	2.2	18.79	160.6

These were rounded off to

0.02	2.2	20	160 µg/L
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## **Acrolein [CAS No. 107-02-8]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 7 species belonging to three taxonomic groups (fish, crustacea and amphibia) none of which included alga.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest acute value} \div 1000 \\ &= 7 \mu\text{g/L} \div 1000 \\ &= 0.007 \mu\text{g/L}\end{aligned}$$

This was rounded to 0.01 µg/L

$$\text{LR (ECL) TV} = 0.01 \mu\text{g/L}$$

### **Marine**

There were only marine toxicity data for 4 species that belonged to 2 taxonomic groups (fish and crustacea).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest acute value} \div 1000 \\ &= 100 \mu\text{g/L} \div 1000 \\ &= 0.1 \mu\text{g/L}\end{aligned}$$

## **Bromacil [CAS No. 314-40-9]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species, a fish. There were no chronic toxicity data.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 182000 \mu\text{g/L} \div 1000 \\ &= 182 \mu\text{g/L}\end{aligned}$$

Which was rounded off to 180 µg/L

$$\text{LR (ECL) TV} = 180 \mu\text{g/L}$$

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

LR (ECL) TV = 180 µg/L

## Glyphosate [CAS No. 1071-83-6]

### Freshwater

#### Fails HR

#### MR Calculations

The data used to derive the TV were:

3 321	149.87	91 959.6	130 000	184 721.21	97 918.33
100	328.88	116 259.46	26 700	106 124.67	97 000
3000	51 029.40	34 945.15	641 232.41	77 722.09	116 017.81

HC1 50%	=	3726
HC5 50%	=	12210
HC10 50%	=	20781
HC20 50%	=	36760

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR for this chemical.

MR TV (HC1 50%) =  $3726 \div 10 = 372.6 = 370 \mu\text{g/L}$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because the HC5 50% TV was too close to the acute toxicity data (i.e. it did not provide adequate protection).

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
372.6	1221	2078.1	3676

These were rounded off to

370	1200	2000	3600 µg/L
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## Marine

### Fails HR and MR

There were no toxicity data for marine organisms. Therefore, the freshwater TV was adopted for marine waters.

LR TV (HC1 50%) = 370 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
372.6	1221	2078.1	3676

These were rounded off to

370	1200	2000	3600 µg/L
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## **Imazethapyr [CAS No.**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 3 species, all of which were a fish

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 240000 \mu\text{g/L} \div 1000 \\ &= 240 \mu\text{g/L}\end{aligned}$$

### **Marine**

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 240 \mu\text{g/L}$$

## **Ioxynil [CAS No. 1689-83-4]**

### **Freshwater**

#### **Fails HR and MR**

There were only acute toxicity data for 1 species.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 350 \mu\text{g/L} \div 1000 \\ &= 0.35 \mu\text{g/L}\end{aligned}$$

This was rounded to 0.4  $\mu\text{g/L}$

$$\text{LR (ECL) TV} = 0.4 \mu\text{g/L}$$

### **Marine**

There were no toxicity data for marine species. Therefore, the freshwater LR (ECL) TV was adopted for marine waters.

$$\text{LR (ECL) TV} = 0.4 \mu\text{g/L}$$

## **Metolachlor [CAS No. 51218-45-2]**

### **Freshwater**

#### **Fails HR and MR**

There were acute toxicity data for 2 species, a fish and a crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}\text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 20.6 \mu\text{g/L} \div 1000 \\ &= 0.0206 \mu\text{g/L}\end{aligned}$$

This was rounded down to 0.02 µg/L

Therefore LR (ECL) TV = 0.02 µg/L

## Marine

There were no toxicity data for marine species. Therefore the freshwater LR (ECL) TV was adopted for marine waters.

Therefore LR (ECL) TV = 0.02 µg/L

## Trifluralin [CAS No. 1582-09-8]

### Freshwater

### Fails HR

### MR Calculations

The data used to derive the TV were:

250	261.45	812.40	3633.18	270	577.55
47.48	75	41.42	105	600	60
2000	60	250	193	387.30	80
50	1734.12	3509.99	50000	210.71	15947.75
636.40	1000	3385.16	35000	30000	30000
8000	130.38				

**NOTE:** The above data contained values that were greater than the twice the aqueous solubility. These data were removed and the TV recalculated below.

250	261.45	812.40	1100	270	577.55
47.48	75	41.42	105	600	60
2000	60	250	193	387.3	80
50	1734.12	3509.99	210.71	636.4	1000
3385.16	8000	130.38			

HC1 50%	=	26.22
HC5 50%	=	44.13
HC10 50%	=	60.69
HC20 50%	=	93.60

**NOTE:** This chemical has a log Kow value greater than 4, therefore it has the potential to bioaccumulate. To account for this the HC1 50% value was used to calculate the TV. Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR for this chemical.

MR TV (HC1 50%) =  $26.22 \div 10 = 2.622 = 2.6 \mu\text{g/L}$

The HC1 50% was adopted for slight to moderately modified ecosystem protection because trifluralin can bioaccumulate and also because the 95% figure is too close to the acute toxicity figures.

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2.622	4.413	6.069	9.36

These were rounded off to

2.6	4.4	6	9 µg/L
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## **Marine Fails HR and MR**

There were no chronic toxicity data but there were acute toxicity data for 1 species — a crustacean.

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality than this and therefore was adopted for marine waters.

LR TV (HC1 50%) = 2.6 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
2.622	4.413	6.069	9.36

These were rounded off to

3	4.4	6	9 µg/L
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## **LAS (normalised NOECs) Freshwater HR Calculations**

There is no CAS No. as the term LAS represents a group of chemicals.

The data used to derive the TV for LAS are not in the database. Therefore, the data from the database should not be used to derive any site-specific TVs or to recalculate TVs as more data becomes available. The data used to derive the TV were obtained from the MHSPE (1994) document. These data were all normalised to an alkyl chain length of 11.6 in order for the toxicity data to be consistent. This consisted of chronic toxicity data for 5 species of algae, 2 crustaceans, 1 insect and 5 fish. Therefore the statistical distribution method could be used.

12000	3500	800	15000	7700	3800
3200	1400	2800	3400	2300	870
3200	340	250			

HC1 50%	=	64.05
HC5 50%	=	278.0
HC10 50%	=	525.3
HC20 50%	=	1006

HR TV = 278 = 280 µg/L

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
64.05	278	525.3	1006

These were rounded off to

65	280	520	1000 µg/L
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## Marine

The data used to derive the TV for LAS are not in the database. Therefore, the data from the database should not be used to derive any site-specific TVs or to recalculate TVs as more data becomes available. The data used to derive the TV were obtained from the MHSPE (1994) document. These data were all normalised to an alkyl chain length of 11.6 in order for the toxicity data to be consistent.

These data consisted of chronic values for 1 crustacean, 2 molluscs and 1 fish. Therefore only an LR (ECL) TV could be derived. However, the freshwater MR TV was of higher quality and could therefore be adopted as an LR TV. But, the freshwater MR TV value of 280 was much greater than the available marine data. Therefore a marine LR (ECL) TV was calculated. An assessment factor of 200 was used as the lowest toxicity value was chronic.

$$\begin{aligned} \text{LR (ECL) TV} &= 25 \div 200 \\ &= 0.125 \\ &= 0.1 \mu\text{g/L} \end{aligned}$$

The other levels of protection could not be calculated as the TV was derived using the AF method.

## AES (normalised NOECs)

### Freshwater

#### HR Calculations

There is no CAS No. as the term AES represents a group of chemicals.

The data used to derive the TV for LAS are not in the database. Therefore, the data from the database should not be used to derive any site-specific TVs or to recalculate TVs as more data becomes available. The data used to derive the TV were obtained from the MHSPE (1994) document. These data were all normalised to an alkyl chain length of 17 in order for the toxicity data to be consistent. The data consisted of chronic values for 5 species that belonged to 4 taxonomic groups (green alga, fish, protozoa and fish).

2400	2400	800	1600	1200
HC1 50%	=	335.8		
HC5 50%	=	643.6		
HC10 50%	=	851.9		
HC20 50%	=	1129.1		
HR TV =	643.6	=	645 µg/L	

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
335.8	643.6	851.9	1129

These were rounded off to

340	650	850	1100 µg/L
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## **Marine Fails HR and MR**

There were no data for marine organisms. Therefore the freshwater TV was adopted for marine waters.

$$\text{LR TV} = 643.6 = 645 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
335.8	643.6	851.9	1129

These were rounded off to

340	650	850	1100 µg/L
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## **AE (normalised NOECs) Freshwater HR Calculations**

There is no CAS No. as the term AE represents a group of chemicals.

The data used to derive the TV for LAS are not in the database. Therefore, the data from the database should not be used to derive any site-specific TVs or to recalculate TVs as more data becomes available. The data used to derive the TV were obtained from the MHSPE (1994) document. These data were all normalised to an alkyl chain length of 13.3 and so the number of alcohol ethoxylate groups was 8.2 in order for the toxicity data to be consistent. There were chronic data for 13 species that belonged to 7 taxonomic groups (fish, crustacea, blue alga, diatoms, green alga, protozoa, and worms).

1900	930	8700	740	1300
200	1300	860	590	1500
720	170	170		

HC1 50%	=	51.98
HC5 50%	=	142.69
HC10 50%	=	224.2
HC20 50%	=	363.9

$$\text{HR TV} = 142.69 = 143 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
51.98	142.69	224.2	363.9

These were rounded off to

50	140	220	360 µg/L
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## **Marine Fails HR and MR**

There were chronic toxicity data for 4 species that belonged to 3 taxonomic groups (fish, crustacea and mollusca).

Therefore only a LR (ECL) TV could be derived. However, the freshwater TV was of higher quality and was therefore adopted for marine waters.

$$\text{LR TV} = 142.69 = 143 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
51.98	142.69	224.2	363.9

These were rounded off to

50	140	220	360 µg/L
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## **BP1100X Freshwater Fails HR and MR**

There were no toxicity data for freshwater species. Therefore the marine LR (ECL) TV was adopted for freshwaters.

$$\text{Therefore LR (ECL) TV} = 25 \mu\text{g/L}$$

## **Marine**

There were only acute toxicity data for 6 species, 1 fish, 3 crustaceans and 2 molluscs.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned} \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\ &= 25\,000 \mu\text{g/L} \div 1000 \\ &= 25 \mu\text{g/L} \end{aligned}$$

## **Corexit 7664 [CAS No. 12774-30-0] Freshwater Fails HR and MR**

There were only acute toxicity data for 1 species, a fish.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 15800 \mu\text{g/L} \div 1000 \\
 &= 15.8 \mu\text{g/L}
 \end{aligned}$$

This was rounded off to 16  $\mu\text{g/L}$ .

$$\text{Therefore LR (ECL) TV} = 16 \mu\text{g/L}$$

## Marine

There were only acute toxicity data for 6 species, which belong to 3 taxonomic groups (fish, crustacea and mollusca).

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 1000 \mu\text{g/L} \div 1000 \\
 &= 1 \mu\text{g/L}
 \end{aligned}$$

## Corexit 8667 [CAS No. 95312-90-6]

### Freshwater

#### Fails HR and MR

There were no toxicity data for freshwater species. Therefore the marine LR (ECL) TV was adopted for freshwater species.

$$\text{Therefore LR (ECL) TV} = 1200 \mu\text{g/L}$$

## Marine

There were only acute toxicity data for 1 species, a crustacean.

Therefore only a LR (ECL) TV could be derived.

$$\begin{aligned}
 \text{LR (ECL) TV} &= \text{lowest value} \div 1000 \\
 &= 1225000 \mu\text{g/L} \div 1000 \\
 &= 1225 \mu\text{g/L}
 \end{aligned}$$

This was rounded down 1200  $\mu\text{g/L}$

$$\text{Therefore LR (ECL) TV} = 1200 \mu\text{g/L}$$

## Corexit 9527 [CAS No. 60617-06-3]

### Freshwater

#### Fails HR and MR

There was a toxicity datum for 1 species — a fish.

Therefore only a LR (ECL) TV could be derived. However, the marine water TV was of higher quality than this and therefore it was adopted for freshwaters.

$$\text{LR TV} = 11038 \div 10 = 1103.8 = 1100 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
233.3	1103.8	2177.3	4403.7

These were rounded off to

230	1100	2200	4400 µg/L
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## **Marine Fails HR MR Calculations**

There were no chronic data. There were acute toxicity data for 11 species that belonged to 4 taxonomic groups (fish, crustacea, mollusca and brown alga).

The data used to derive the TV were:

34734.97	100000	169715.20	162000
6023.38	733212.11	78094.73	965489.38
100000	200000		

HC1 50%	=	2333
HC5 50%	=	11038
HC10 50%	=	21773
HC20 50%	=	44037

**NOTE:** Because this TV was derived using acute toxicity data it is a MR TV and must be divided by either a default AF of 10 or an ACR. There was no ACR.

$$\text{MR TV} = 11038 \div 10 = 1103.8 = 1100 \mu\text{g/L}$$

The other levels of protection are:

<b>99%</b>	<b>95%</b>	<b>90%</b>	<b>80%</b>
233.3	1103.8	2177.3	4403.7

These were rounded off to

230	1100	2200	4400 µg/L
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## **Corexit 9500 Fresh and Marine waters combined Fails HR Meets MR**

There were no chronic toxicity data. There were acute toxicity data for 15 species that belonged to 5 taxonomic groups (fish, crustacea, mollusca, diatom and brown alga).

However, the data for this chemical arrived extremely late in the derivation process and so they could not be screened (i.e. have their quality assessed). Therefore, even though a MR TV could have been calculated (and this method was used) the TV was classed as a Low reliability LR TV because of the greater uncertainty associated with the toxicity data.

Normally toxicity data based on 24 hour exposure were not used to derive TVs but in this case it was included.



HC1 50% = 140  
 HC5 50% = 1450  
 HC10 50% = 3930  
 HC20 50% = 10720

LR TV = 1450 ÷ 10 = 140 µg/L

The other levels of protection are:

99%	95%	90%	80%
14	145	393	1072

These were rounded off to

15	150	400	1100 µg/L
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