

**‘NITRATES’ DIRECTIVE  
(91/676/CEE)**

**Status and trends of aquatic environment and agricultural  
practice**

**Development guide for Member States’ reports**

**ANNEX**

**Reporting templates and formats for  
Geographical information and summary tables  
on water quality**

**2008**

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## 1 Preamble

This annex is part of the development guide for Member States' reports and contains the technical specifications for spatial information and summary tables.

In order to analyze water quality data provided by 27 Member States<sup>1</sup> for the 4<sup>th</sup> Reporting period we intend to adapt both the data infrastructure as well as the way of data delivery (via Reportnet) as much as possible to WISE (Water Information System Europe).

The purpose of this document is to support countries in reporting good quality data. This document contains detailed specifications in a structured format for the geographical information (part 1) and summary tables (part 2) on water quality. The summary tables can help to summarize water quality data in the Member States at national level. Furthermore the tables can help as a control of the results once a (geo) database has been compiled.

For the data delivery on water quality and Nitrate Vulnerable Zone areas, the MS can make use of the automatically generated technical specifications and table definitions which will be available on Reportnet. The templates (XML schemas or Excel) and the specifications will guide in formatting and collating the data delivery. All will be available for download from the Data Dictionary in Reportnet.

Suggestions from users on how to improve the document are welcome.

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<sup>1</sup> In the reporting period 2000-2003 for which 15 Member States had the obligation to submit a report data from over 40.000 monitoring were submitted. This number will increase substantially in 2008, when the obligation to report will apply to 25 Member States

## 2 Data for the evaluation of water quality under the Nitrates Directive

The data required for the evaluation of water quality for Nitrates Directive are the following:

### Monitoring networks

- groundwater sampling points - types: phreatic shallow, phreatic deep, captive and karstic groundwater.
- surface (fresh) water sampling points - types: rivers and lakes/reservoirs
- transitional, coastal and marine water sampling points - types transitional (=estuarine) water, coastal water and marine water.

### Groundwater quality data linked to the monitoring stations

- data per station on average annual nitrate concentration
- data per station on maximum nitrate concentration
- trends per station on average nitrate concentration between the current and previous reporting period.

### Surface water quality data for river and lakes linked to the monitoring stations

- data per station on average (annual and winter) nitrate concentration
- data per station on the maximum nitrate concentration
- trends in average nitrate concentration between the current and previous reporting period
- trophic state / eutrophication parameters per station
- trends on trophic state / eutrophication parameters between the current and previous reporting period

### Surface water quality data for transitional/coastal/marine water linked to the monitoring stations

- data per station on average (annual and winter) nitrate concentration
- data per station on the maximum nitrate concentration
- trends in average nitrate concentration between the current and previous reporting period
- trophic state / eutrophication parameters per station
- trends on trophic state / eutrophication parameters between the current and previous reporting period



# **Part 1**

**Reporting templates  
for geographical data  
on water quality**

### 3 Definition of ND Groundwater dataset

#### 3.1 General information for ND Groundwater dataset

Short name	Nitrates Directive groundwater
Version	1
Definition	Data on groundwater monitoring stations are collected for each reporting period (4 year period). Full details of the data requested on groundwater are presented in this specification by tables and include characteristics on the groundwater monitoring stations as well as values for the concentrations of NO <sub>3</sub> for each station.
Methodology	<p>The data requested for Nitrates Directive should be derived from existing national and/or regional monitoring networks within each Member State. The combination of the fields CountryCode, NationalStationCode and StationType must create a unique record in the table. No duplicate records should exist with this combination.</p> <p>Please consider the following when compiling your data delivery:</p> <ol style="list-style-type: none"> <li>1. Provide information on the monitoring stations. Station location must represent a point location.</li> <li>2. Submit NO<sub>3</sub> concentrations sampled during a period of one or more years.</li> <li>3. Submit data for each sample site (no aggregation of stations).</li> </ol> <p><u>Filling out the tables:</u>  All elements are required to be filled out unless “Optional” has been indicated or unless the element is not applicable (e.g. if a monitoring station is not used for reporting for WFD, the element EU_CD cannot be filled out.)  If “mandatory” is indicated, the element shall always be filled in. and after submitting the table in Reportnet, the QA in Reportnet will give an error message if the content of the cell will be empty.</p>
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#### 3.2 Overview of ND Groundwater dataset tables

Name	Definition
List of groundwater monitoring stations	Detailed information on the characteristics of the monitoring stations
NO <sub>3</sub> concentrations in groundwater	NO <sub>3</sub> concentrations measured in each groundwater monitoring station.

### 3.3 Tables

#### 3.3.1 List of groundwater monitoring stations table

Column name	Column definition	Methodology	Data specifications
Country Code (CountryCode)	Two letter code for Country, as defined in the code list.	ISO 3166-alpha-2 code elements See code list 7.1.	Data type: string Size: 2
National station code (NationalStationCode)	Nationally assigned, unique identifier of the groundwater monitoring station.	This is a mandatory element.	Data type: string Min. size: 0 Max. size: 50
Station Type (StationType)	Station Type as defined in code list.	This is a mandatory element. For station types see code list 7.2.	Data type: string Size: 2
National station name (NationalStationName)	National name of the groundwater monitoring station.	Optional.	Data type: string Min. size: 0 Max. size: 255
Water Body ID (WaterBodyID)	National identification code of water body (if available) in which station is located.	Water body ID as required/defined by the WFD.	Data type: string Min. size: 0 Max. size: 255
Water Body Name (WaterBodyName)	Name of groundwater body in which monitoring station is located.	Water body Name as required/defined by the WFD	Data type: string Min. size: 0 Max. size: 255
Depth <sup>2</sup> (Depth)	Depth in meters below soil surface	This is a mandatory element. Indicate at which depth in meters samples are taken.	Data type: float Size: 5 Decimal precision: 1
National station code Nitrates Directive (NationalStationCodeND)	Nationally assigned, unique identifier of the groundwater monitoring station used for previous ND reporting.	Only to fill in if another code for this station have been used for the 3 <sup>rd</sup> reporting period of ND.	Data type: string Min. size: 0 Max. size: 50

<sup>2</sup> It is referred to paragraph 3.1.2.2 on sampling site selection of the Guidelines for the Monitoring required under the Nitrates Directive (EC, 2003). The paragraph gives clarification on monitoring depth for groundwater bodies. The paragraph is copied at the end of this annex. Exact depth figures must be indicated. The station type refers only to depth classes but does not indicate the exact depth.

WFD station code (EU_CD)	Station (code) already in WFD database	Only to fill in if another code for this station has been reported to WFD.	Data type: string Min. size: 0 Max. size: 50
Waterbase station code (WaterbaseID)	Station (code) already in WB (WaterBase)	Only to fill in if another code for this station has been reported under the Eionet/Water or Waterbase.	Data type: string Min. size: 0 Max. size: 50
Drinking water station (Drinking)	Station in use for Drinking water	Indicate "True" if site is in use for drinking water.	Data type: boolean Size: 1 True/False
Longitude (Longitude)	(X) International geographical co-ordinates in decimal degrees format.	This is a required, not NULL field. Provide Longitude using the common geodetic datum ETRS89 (rivers, lakes, groundwater) or WGS84 (transitional,coastal, marine) <i>Negative values should be used for co-ordinates west of the Greenwich Meridian (0 degrees).</i> <i>Please do not round co-ordinate values</i>	Data type: float Maximum size: 10 Minimum value: -180 Maximum value: 180 Decimal precision: 7 Unit: decimal degrees
Latitude (Latitude)	(Y) International geographical co-ordinates in decimal degrees format.	This is a required, not NULL field. Provide Latitude using the common geodetic datum ETRS89 (rivers, lakes, groundwater) or WGS84 (transitional,coastal, marine) <i>Negative values should be used for co-ordinates west of the Greenwich Meridian (0 degrees).</i> <i>Please do not round co-ordinate values.</i>	Data type: float Maximum size: 10 Minimum value: -90 Maximum value: 90 Decimal precision: 7 Unit: decimal degrees

### 3.3.2 NO<sub>3</sub> concentrations in groundwater table

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the groundwater monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of the groundwater water monitoring stations	Data type: string Min. size: 0, Max size.: 50
Beginning Date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10, Max. size: 10
End Date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10, Max. size: 10
Unit of measurement (MeasurementUnit)	Unit of measurement for NO <sub>3</sub> .	This is a mandatory element. See codelist	Data type: string Maximum.size: 10
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period	This is a mandatory element. The total number of samples taken within the measurement period	Data type: integer Maximum size: 4 Minimum value: 1
Average annual value (AverageAnnualValue)	Average(mean) concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Maximum value (MaximumValue)	Maximum concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Maximum concentration of NO <sub>3</sub> in mg/L measured in the measurement period.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Trend annual value* (TrendAnnualValue)	Trend between the current and previous reporting periods based on annual average(mean) values	The difference between the average NO <sub>3</sub> concentration of the current reporting period and the average of the previous reporting period (average current RP – average 3rd RP).	Data type: float Maximum. size: 6 Decimal precision: 2

\* Trends can only be calculated for monitoring stations at the same location (X,Y) and measurements at the same depth

## 4 Definition of ND surface water dataset

### 4.1 General information for ND surface water datasets for rivers and lakes

Short name	Nitrates Directive Surface Water
Version	1
Definition	Data on surface water monitoring stations are collected for each reporting period (4 year period). Full details of the data requested on surface water are presented in this specification by tables and include characteristics on the surface water monitoring stations, values for the concentrations of NO <sub>3</sub> for each station as well as values for eutrophication parameters for each station. Data on lakes refer both to natural and artificial basins. The eutrophication parameters used for rivers and lakes/reservoirs can be different.
Methodology	The data requested for Nitrates Directive should be derived from existing national and/or regional monitoring networks within each Member State. The combination of the fields CountryCode, NationalStationCode and StationType must create a unique record in the table. No duplicate records should exist with this combination. Please consider the following when compiling your data delivery: <ol style="list-style-type: none"> <li>1. Provide information on the monitoring stations. Station location must represent a point location.</li> <li>2. Submit NO<sub>3</sub> concentrations sampled during a period of one or more years.</li> <li>3. Submit data on trophic state and/or eutrophication parameters</li> <li>4. Submit data for each sample site (no aggregation of stations).</li> </ol> Measuring period: <ol style="list-style-type: none"> <li>1. Annual: data sampled over periods of 12 months.</li> <li>2. Winter: data sampled for the months October to March.</li> <li>3. Summer: data sampled for the months April up to and including September.</li> </ol>
Contact Information	

### 4.2 Overview of ND Surface water dataset tables

Name	Definition
List of river monitoring stations.	Detailed information on the characteristics of the river monitoring stations.
NO <sub>3</sub> concentrations in rivers.	NO <sub>3</sub> concentrations measured in each river monitoring station.
Trophic state in rivers.	Trophic state measured in each river monitoring station.
Concentrations of eutrophication parameters in rivers.	Concentrations of eutrophication parameters measured in each river monitoring station.
List of lake monitoring stations.	Detailed information on the characteristics of the lake monitoring stations.
NO <sub>3</sub> concentrations in lakes.	NO <sub>3</sub> concentrations measured in each lake monitoring station.
Trophic state in lakes.	Trophic state measured in each lake monitoring station.
Concentrations of eutrophication parameters in lakes.	Concentrations of eutrophication parameters measured in each lake monitoring station.

## 4.3 Tables

### 4.3.1 List of river monitoring stations table

Column name	Column definition	Methodology	Data specifications
Country Code (CountryCode)	Two letter code for Country, as defined in the code list.	ISO 3166-alpha-2 code elements See code list 7.1.	Data type: string Size: 2
National station code (NationalStationCode)	Nationally assigned, unique identifier of the river monitoring station.	This is a mandatory element.	Data type: string Min.size: 0 Max. size: 50
Station Type (StationType)	Station Type as defined in code list 7.2.	This is a mandatory element. Code for river = 4	Data type: string Size: 2
National station name (NationalStationName)	National name of the monitoring station	Optional	Data type: string Min.size: 0 Max. size: 255
Water Body ID (WaterBodyID)	National identification code of water body (if available) in which station is located.	Water body ID as required/defined by the WFD.	Data type: string Min. size: 0 Max. size: 255
Water Body Name (WaterBodyName)	Name of Water body in which monitoring station is located.	Water body Name as required/defined by the WFD	Data type: string Min. size: 0 Max. size: 255
Name of a water entity (WaterEntityName)	National name of river.		Data type: string Min. size: 0 Max. size: 255
Altitude (Altitude)	Altitude of River station in meters above sea level.	Altitude of station in meters above sea level	Data type: float Max. size: 8 Decimal precision: 2 Unit: meters
National station code Nitrates Directive (NationalStationCodeND)	Nationally assigned, unique identifier of the river monitoring station used for previous ND reporting.	Only to fill in if another code for this station have been used for the 3 <sup>rd</sup> reporting period of ND.	Data type: string Min. size: 0 Max. size: 50
WFD station code (EU_CD)	Station (code) already in WFD database	Only to fill in if another code for this station has been reported to WFD.	Data type: string Min. size: 0 Max. size: 50

Waterbase station code (WaterbaseID)	Station (code) already in WB (WaterBase)	Only to fill in if another code for this station has been reported under the Eionet/Water or Waterbase.	Data type: string Min. size: 0 Max. size: 50
Longitude(Longitude)	(X) International geographical co-ordinates in decimal degrees format.	This is a required, not NULL field. Provide Longitude using the common geodetic datum ETRS89 (rivers, lakes, groundwater) or WGS84 (transitional,coastal, marine) <i>Negative values should be used for co-ordinates west of the Greenwich Meridian (0 degrees).</i> <i>Please do not round co-ordinate values</i>	Data type: float Maximum size: 10 Minimum value: -180 Maximum value: 180 Decimal precision: 7 Unit: decimal degrees
Latitude (Latitude)	(Y) International geographical co-ordinates in decimal degrees format.	This is a required, not NULL field. Provide Latitude using the common geodetic datum ETRS89 (rivers, lakes, groundwater) or WGS84 (transitional,coastal, marine) <i>Negative values should be used for co-ordinates west of the Greenwich Meridian (0 degrees).</i> <i>Please do not round co-ordinate values.</i>	Data type: float Maximum size: 10 Minimum value: -90 Maximum value: 90 Decimal precision: 7 Unit: decimal degrees

#### 4.3.2 NO<sub>3</sub> concentrations in rivers table

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the river monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of river monitoring stations	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
End date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10

Unit of measurement (MeasurementUnit)	Unit of measurement for NO <sub>3</sub> .	This is a mandatory element. For unit see code list	Data type: string Max. size: 10
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period	This is a mandatory element. The total number of samples taken within the measurement period	Data type: integer Maximum size: 4 Minimum value: 1
Average annual value (AvgAnnualValue)	Average(mean) annual concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Average value for NO <sub>3</sub> sampled over 1 or more years.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Average winter value (AvgWinterValue)	Average (mean) winter concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Average value for NO <sub>3</sub> sampled over the winter periods October to March.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Maximum value (MaximumValue)	Maximum concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Maximum concentration of NO <sub>3</sub> in mg/L measured in the measurement period..	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Trend annual value * (TrendAnnualValue)	Trend between the current and previous reporting period based on annual average (mean) values.	The difference between the average annual NO <sub>3</sub> concentration of the current reporting period and the average of the previous reporting period (average current RP – average 3rd RP).	Data type: float Maximum. size: 6 Decimal precision: 2
Trend winter value * (TrendWinterValue)	Trend between the current and previous reporting period based on winter average (mean) values.	The difference between the average winter NO <sub>3</sub> concentration of the current reporting period and the average of the previous reporting period (average current RP – average 3rd RP).	Data type: float Maximum. size: 6 Decimal precision: 2

\* Trends can only be calculated for monitoring stations at the same location (X,Y) and measurements at the same depth.

### 4.3.3 Trophic state in rivers table

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the river monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of the river monitoring stations.	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
End date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period.	This is a mandatory element. The total number of samples taken within the measurement period	Data type: integer Maximum size: 4 Minimum value: 1
Trophic state (TrophicState)	Name for trophic status as defined in the code list.	This is a mandatory element. For trophic status of rivers see code list 7.3.1.	Data type: string Min. size: 0 Max. size: 32

#### 4.3.4 Eutrophication parameters in rivers table \*

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the river monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of river monitoring stations	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
End date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
Name of parameter (ParameterName)	Name of nutrient or other parameter determinand, as defined in the code list for rivers.	This is a mandatory element. For nutrient or other parameter determinand for rivers see code list 7.3.2.	Data type: integer Min. size: 1 Max. size: 50
Unit of measurement (MeasurementUnit)	Unit of measurement of parameter, as defined in the code lists	This is required, not NULL field. Units of measurement depend on the nutrient or other parameter determinand measured, see code lists 7.3.2	Data type: string Min.size: 0 Max. size: 10
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period	This is a mandatory element.. The total number of samples taken within the measurement period	Data type: integer Maximum size: 4 Minimum value: 1
Average value (AverageValue)	Average (mean) annual ** concentration of the nutrient or other parameter determinand for the measurement period.	This is a mandatory element.	Data type: float Maximum. size: 8 Minimum value: 0 Decimal precision: 4

\* For each parameter a separate table has to be used

\*\* For Chl-a summer average has to be indicated



#### 4.3.5 List of lake monitoring stations table

Column name	Column definition	Methodology	Data specifications
Country Code (CountryCode)	Two letter code for Country, as defined in the code list.	ISO 3166-alpha-2 code elements See code list 7.1.	Data type: string Size: 2
National station code (NationalStationCode)	Nationally assigned, unique identifier of the lake monitoring station.	This is a mandatory element.	Data type: string Min.size: 0 Max. size: 50
Station type (StationType)	Station Type as defined in code list 7.2.	This is a mandatory element. Code for lake = 5	Data type: string Size: 2
National station name (NationalStationName)	National name of the monitoring station	Optional	Data type: string Min.size: 0 Max. size: 255
Water Body ID (WaterBodyID)	National identification code of water body (if available) in which station is located.	Water body ID as required/defined by the WFD.	Data type: string Min. size: 0 Max. size: 255
Water Body Name (WaterBodyName)	Name of Water body in which monitoring station is located.	Water body Name as required/defined by the WFD	Data type: string Min. size: 0 Max. size: 255
Name of a water entity (WaterEntityName)	National name of lake.		Data type: string Min. size: 0 Max. size: 255
Altitude (Altitude)	Altitude of Lake station in meters above sea level.	Altitude of lake above sea level in meters	Data type: float Max. size: 8 Decimal precision: 2 Unit: meters
National station code Nitrates Directive (NationalStationCodeND)	Nationally assigned, unique identifier of the lake monitoring station used for previous ND reporting.	Only to fill in if another code for this station have been used for the 3 <sup>rd</sup> reporting period of ND.	Data type: string Min. size: 0 Max. size: 50
WFD station code (EU_CD)	Station (code) already in WFD database	Only to fill in if another code for this station has been reported to WFD.	Data type: string Min. size: 0 Max. size: 50
Waterbase station code (WaterbaseID)	Station (code) already in WB (WaterBase)	Only to fill in if another code for this station has been reported under the Eionet/Water or Waterbase.	Data type: string Min. size: 0 Max. size: 50

Longitude(Longitude)	(X) International geographical co-ordinates in decimal degrees format.	This is a required, not NULL field. Provide Longitude using the common geodetic datum ETRS89 (rivers, lakes, groundwater) or WGS84 (transitional,coastal, marine) <i>Negative values should be used for co-ordinates west of the Greenwich Meridian (0 degrees).</i> <i>Please do not round co-ordinate values</i>	Data type: float Maximum size: 10 Minimum value: -180 Maximum value: 180 Decimal precision: 7 Unit: decimal degrees
Latitude (Latitude)	(Y) International geographical co-ordinates in decimal degrees format.	This is a required, not NULL field. Provide Latitude using the common geodetic datum ETRS89 (rivers, lakes, groundwater) or WGS84 (transitional,coastal, marine) <i>Negative values should be used for co-ordinates west of the Greenwich Meridian (0 degrees).</i> <i>Please do not round co-ordinate values.</i>	Data type: float Maximum size: 10 Minimum value: -90 Maximum value: 90 Decimal precision: 7 Unit: decimal degrees

#### 4.3.6 NO<sub>3</sub> concentrations in lakes table

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the lake monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of lake monitoring stations	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
End date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
Unit of measurement (MeasurementUnit)	Unit of measurement for NO <sub>3</sub>	This is a mandatory element. For unit see code list	Data type: string <b>Max. size: 10</b>
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period	This is a mandatory element.. The total number of samples taken within the	Data type: integer Maximum size: 4

		measurement period	Minimum value: 1
Average annual value (AvgAnnualValue)	Average(mean) annual concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Average value for NO <sub>3</sub> sampled over 1 or more years.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Average winter value (AvgWinterValue)	Average (mean) winter concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Average value for NO <sub>3</sub> sampled over the winter periods October to March.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Maximum value (MaximumValue)	Maximum concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Maximum concentration of NO <sub>3</sub> in mg/L measured in the measurement period.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Trend annual value * (TrendAnnualValue)	Trend between the current and previous reporting period based on annual average(mean) values.	The difference between the average NO <sub>3</sub> concentration of the current reporting period and the average of the previous reporting period. (avg. current RP – avg. previous RP)	Data type: float Maximum. size: 6 Decimal precision: 2
Trend winter value * (TrendWinterValue)	Trend between the current and previous reporting period based on winter average(mean) values.	The difference between the average winter NO <sub>3</sub> concentration of the current reporting period and the average of the previous reporting period. (avg. winter current RP – avg. winter previous RP)	Data type: float Maximum. size: 6 Decimal precision: 2

\* Trends can only be calculated for monitoring stations at the same location (X,Y) and measurements at the same depth

#### 4.3.7 Trophic state in lakes table \*

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the lake monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of the lake monitoring stations.	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
End date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period.	This is a mandatory element.	Data type: integer Maximum size: 4 Minimum value: 1
Trophic state (TrophicState)	Name for trophic status as defined in the code list.	This is a mandatory element. For trophic status of lakes see code list 7.3.1.	Data type: string Min. size: 0 Max. size: 32

#### 4.3.8 Eutrophication parameters in lakes table \*

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the lake monitoring station.	This is a mandatory element Must be the code of a station, which appears in the list of lake monitoring stations	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
End date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10

Name of parameter (ParameterName)	Name of nutrient or other parameter determinand, as defined in the code list for lakes.	This is a mandatory element. For nutrient or other parameter determinand for lakes see code list 7.3.3.	Data type: integer Min. size: 1 Max. size: 50
Unit of measurement (MeasurementUnit)	Unit of measurement of parameter, as defined in the code lists	This is required, not NULL field. Units of measurement depend on the nutrient or other parameter determinand measured, see code list 7.3.3.	Data type: string <b>Min.size: 0 Max. size: 10</b>
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period	This is a mandatory element.. The total number of samples taken within the measurement period	Data type: integer Maximum size: 4 Minimum value: 1
Average value (AvgValue)	Average (mean) annual ** concentration of the nutrient or other parameter determinand for the measurement period.	This is a mandatory element.	Data type: float Maximum. size: 8 Minimum value: 0 Decimal precision: 4

\* For each parameter a separate table has to be used

\*\* For Chl-a summer average has to be indicate

## 5 Definition of ND transitional/coastal and marine water dataset

### 5.1 General information for ND transitional/coastal/marine water dataset

Short name	Nitrates Directive transitional/coastal and marine water
Version	1
Definition	<p>Data on transitional/coastal and marine water monitoring stations are collected for each reporting period (4 year period).</p> <p>Full details of the data requested on transitional/coastal and marine water are presented in this specification by tables and include characteristics on the transitional/coastal and marine water monitoring stations, values for the concentrations of NO<sub>3</sub> for each station as well as values for eutrophication parameters for each station.</p> <p>The table formats of the stations and the sampling data for transitional/coastal and marine water are the same. The code lists for the eutrophication parameters are different.</p>
Methodology	<p>The data requested for Nitrates Directive should be derived from existing national and/or regional monitoring networks within each Member State.</p> <p>The combination of the fields CountryCode, NationalStationCode and StationType must create a unique record in the table. No duplicate records should exist with this combination.</p> <p>Please consider the following when compiling your data delivery:</p> <ol style="list-style-type: none"> <li>1. Provide information on the monitoring stations. Station location must represent a point location.</li> <li>2. Submit NO<sub>3</sub> concentrations sampled during a period of one or more years.</li> <li>3. Submit data on trophic state and/or eutrophication parameters</li> </ol> <p>Measuring period:</p> <ol style="list-style-type: none"> <li>1. Annual: data sampled over periods of 12 months.</li> <li>2. Winter: data sampled (October to March)</li> <li>3. Summer: data sampled (April up to and including September)</li> </ol>
Contact Information	

### 5.2 Overview of ND transitional/coastal /marine dataset tables

Name	Definition
List of transitional/coastal /mar transitional, coastal or marine monitoring Stations	Detailed information on the characteristics of the transitional, coastal or marine monitoring stations.
NO <sub>3</sub> concentrations in transitional, coastal or marine water.	NO <sub>3</sub> concentrations measured in each transitional, coastal or marine water monitoring station.
Trophic state in transitional, coastal or marine water	Trophic state measured in each transitional, coastal or marine monitoring station.
Concentrations of eutrophication parameters in transitional, coastal or marine water.	Concentrations of eutrophication parameters measured in each transitional, coastal or marine water monitoring station.

## 5.3 Tables

### 5.3.1 List of transitional, coastal and marine monitoring stations table

Column name	Column definition	Methodology	Data specifications
Country Code (CountryCode)	Two letter code for Country, as defined in the code list.	ISO 3166-alpha-2 code elements See code list 7.1.	Data type: string Size: 2
National station code (NationalStationCode)	Nationally assigned, unique identifier of the transitional, coastal or marine monitoring station.	This is a mandatory element.	Data type: string Min.size: 0 Max. size: 50
Station type (StationType)	Station Type as defined in code list 7.2.	This is a mandatory element. Code for transitional water = 6 Code for coastal water = 7 Code for marine water = 8	Data type: string Size: 2
National station name (NationalStationName)	National name of the monitoring station	Optional	Data type: string Min.size: 0 Max. size: 255
Water Body ID (WaterBodyID)	National identification code of water body (if available) in which station is located.	Water body ID as required/defined by the WFD.	Data type: string Min. size: 0 Max. size: 255
Water Body Name (WaterBodyName)	Name of Water body in which monitoring station is located.	Water body Name as required/defined by the WFD	Data type: string Min. size: 0 Max. size: 255
Name of a water entity (WaterEntityName)	Name Transitional, coastal, marine or sea area in which monitoring station is located		Data type: string Min. size: 0 Max. size: 255
National station code Nitrates Directive (NationalStationCodeND)	Nationally assigned, unique identifier of the transitional, coastal or marine monitoring station used for the previous ND reporting.	Only to fill in if another code for this station have been used for the 3 <sup>rd</sup> reporting period of ND.	Data type: string Min. size: 0 Max. size: 50
WFD station code (EU_CD)	Station (code) already in WFD database	Only to fill in if another code for this station has been reported to WFD.	Data type: string Min. size: 0 Max. size: 50

Waterbase station code (WaterbaseID)	Station (code) already in WB (WaterBase)	Only to fill in if another code for this station has been reported under the Eionet/Water or Waterbase.	Data type: string Min. size: 0 Max. size: 50
Longitude(Longitude)	(X) International geographical co-ordinates in decimal degrees format.	This is a required, not NULL field. Provide Longitude using the common geodetic datum ETRS89 (rivers, lakes, groundwater) or WGS84 (transitional,coastal, marine) <i>Negative values should be used for co-ordinates west of the Greenwich Meridian (0 degrees).</i> <i>Please do not round co-ordinate values</i>	Data type: float Maximum size: 10 Minimum value: -180 Maximum value: 180 Decimal precision: 7 Unit: decimal degrees
Latitude (Latitude)	(Y) International geographical co-ordinates in decimal degrees format.	This is a required, not NULL field. Provide Latitude using the common geodetic datum ETRS89 (rivers, lakes, groundwater) or WGS84 (transitional,coastal, marine) <i>Negative values should be used for co-ordinates west of the Greenwich Meridian (0 degrees).</i> <i>Please do not round co-ordinate values.</i>	Data type: float Maximum size: 10 Minimum value: -90 Maximum value: 90 Decimal precision: 7 Unit: decimal degrees

### 5.3.2 NO<sub>3</sub> concentrations in Transitional, Coastal or Marine water table

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the transitional, coastal or marine monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of transitional, coastal or marine monitoring stations	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
End date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10

Unit of measurement (MeasurementUnit)	Unit of measurement for NO <sub>3</sub>	This is a mandatory element. For unit see code list	Data type: string Max. size: 10
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period	This is a mandatory element.. The total number of samples taken within the measurement period	Data type: integer Maximum size: 4 Minimum value: 1
Average annual value (AvgAnnualValue)	Average (mean) annual concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Average value for NO <sub>3</sub> sampled over periods of 12 months.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Average winter value (AvgWinterValue)	Average (mean) winter concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Average value for NO <sub>3</sub> sampled over the winter periods October to March.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Maximum value (MaximumValue)	Maximum concentration of NO <sub>3</sub> for the measurement period.	This is a mandatory element. Maximum concentration of NO <sub>3</sub> in mg/L measured in the measurement period.	Data type: float Maximum. size: 6 Minimum value: 0 Decimal precision: 2
Trend annual value * (TrendAnnualValue)	Trend between the current and previous reporting period based on annual average(mean) values.	The difference between the average NO <sub>3</sub> concentration of the current reporting period and the average of the previous reporting period. (avg. current RP – avg. previous RP)	Data type: float Maximum. size: 6 Decimal precision: 2
Trend winter value * (TrendWinterValue)	Trend between the current and previous reporting period based on winter average(mean) values.	The difference between the average winter NO <sub>3</sub> concentration of the current reporting period and the average of the previous reporting period. (avg. winter current RP – avg. winter previous RP)	Data type: float Maximum. size: 6 Decimal precision: 2

\* Trends can only be calculated for monitoring stations at the same location (X,Y) and measurements at the same depth.



### 5.3.3 Trophic state in Transitional, Coastal or Marine water table

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the transitional, coastal or marine monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of the transitional, coastal or marine monitoring stations.	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
End date (EndDate)	Last date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the end date of the period for which samples were taken	Data type: date Min. size: 10 Max. size: 10
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period.	This is a mandatory element.. The total number of samples taken within the measurement period	Data type: integer Min. size: 1 Max. size: 4
Trophic state (TrophicState)	Name for trophic status as defined in the code list.	This is a mandatory element. For trophic status of transitional, coastal or marine see code list 7.3.1.	Data type: string Min. size: 0 Max. size: 32

### 5.3.4 Eutrophication parameters in transitional, coastal or marine water table \*

Column name	Column definition	Methodology	Data specifications
National station code (NationalStationCode)	Nationally assigned, unique identifier of the transitional, coastal or marine monitoring station.	This is a mandatory element. Must be the code of a station, which appears in the list of transitional, coastal or marine monitoring stations.	Data type: string Min. size: 0 Max. size: 50
Beginning date (BeginDate)	Beginning date of measurement period in format YYYY-MM-DD.	This is a mandatory element. Indicate the beginning date of the period for which samples were taken.	Data type: date Min. size: 10 Max. size: 10
End date	Last date of measurement period in	This is a mandatory element.	Data type: date

(EndDate)	format YYYY-MM-DD.	Indicate the end date of the period for which samples were taken.	Min. size: 10 Max. size: 10
Name of parameter (ParameterName)	Name of nutrient or other parameter determinand, as defined in the code list for transitional, coastal or marine waters.	This is a mandatory element. For nutrient or other parameter determinand for transitional or coastal water see table 7.3.4, for marine water see code list 7.3.5.	Data type: integer Min. size: 1 Max. size: 50
Unit of measurement (MeasurementUnit)	Unit of measurement of parameter, as defined in the code lists	This is required, not NULL field. Units of measurement depend on the nutrient or other parameter determinand measured, see code lists 7.3.4 or 7.3.5.	Data type: string Maximum size: 10
Number of samples (NumberOfSamples)	Number of samples taken within the measurement period	This is a mandatory element.	Data type: integer Maximum size: 4 Minimum value: 1
Average value (AvgValue)	Average (mean) annual ** concentration of the nutrient or other parameter determinand for the measurement period.	This is a mandatory element.	Data type: float Maximum. size: 8 Minimum value: 0 Decimal precision: 4

\* For each parameter a separate table has to be used

\*\* For Chl-a summer average has to be indicated

## 6 Definition of Nitrate Vulnerable Zones dataset<sup>3</sup>

### 6.1 General information for Nitrate Vulnerable Zones dataset

The database on the geographical information of Nitrate Vulnerable is hosted by JRC. Templates have been developed by JRC based on the recommendations made in the Water Framework Directive<sup>4</sup>.

Shapefiles according to the templates are requested for the Nitrate Vulnerable Zones and Potential Vulnerable Zones.

For the Member States that apply a whole territory approach (according to article 3 §5 of the directive), a table has been included to supply information on legal acts.

If Member States applying a whole territory approach want to supply GIS information on the risk areas with their country boundaries, the Data Dictionary will provide a template for this.

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<sup>3</sup> Member States that have chosen not to designate specific vulnerable zones as referred to in article 3 § 5 of the directive, but to implement an action programme on the whole territory have to indicate in the following table the date of approval of the action programme

Separate table (see table 6.2.3) to be included for MS that apply a whole territory approach containing 3 fields: WTA (yes/no), Beginning Date (start date of legal act), end date (eventual end date of legal act)

<sup>4</sup> Common Implementation Strategy for the WFD (2000/60/EC); Guidance document n°9 'Implementing the GIS elements of the WFD (EC 2003 ISBN 92-894-5129-7)



## 6.2 Templates for Nitrate Vulnerable zones (from NVZ database JRC)

### 6.2.1 Nitrate Vulnerable Zones

Column name	Column definition	Methodology	Data specifications
NAME	Name Nitrate Vulnerable Zone		Data type: string Max. size: 50
COUNTRY	ISO Code of Country (2 characters)		Data type: string Size: 2 - see annex codelist 7.1
ZONEID	ID Zone number (if present)		Data type: string Max. size: 50
TYPE	Designated year or drafted zone		Data type: string Max. size: 50
NAMECOHER	Name of coherent group of vulnerable areas	To be filled in if relevant	Data type: string Max. size: 50
BEGINDATE	Beginning date of validity		Data type: date Min. size: 10 Max. size: 10
ENDDATE	Ending date of validity		Data type: date Min. size: 10 Max. size: 10
INSERTEDWHEN	Timestamp of edition		Data type: date Min. size: 10 Max. size: 10
INSERTEDBY	Editor		Data type: string Max. size: 15
VALIDITY	Validity *		Data type: Long integer Size 1: see Code list below this table
AREAKM	Area computed by the GIS software		Data type: Double
AREA_DECLARED	Area declared by the Member State Authorities		Data type: Double
SHAPE_Length			Data type: Double
SHAPE_Area			Data type: Double

\* code table for validity

VALUE	DEFINITION
1	Valid
2	Non valid
3	Valid drafted Zone
4	Obsolete drafted zone

### 6.2.2 Potential Vulnerable Zones

Column name	Column definition	Methodology	Data specifications
VALIDITY	Validity *		Data type: Long integer Size 1: see Code list below this table
SHAPE			Data type: Geometry
SHAPE_Length			Data type: Double
SHAPE_Area			Data type: Double

\* code table for validity

VALUE	DEFINITION
1	Valid
2	Non valid

### 6.2.3 Whole Territory Approach (WTA)

Column name	Column definition	Methodology	Data specifications
COUNTRY	ISO Code of Country (2 characters)		Data type: string Size: 2 - see annex codelist 7.1
WTA	Whole territory approach		Data type: string Size: 1 Y/N
BEGINDATE	Start date of legal act		Data type: date Min. size: 10 Max. size: 10
ENDDATE	Eventual end date of legal act		Data type: date Min. size: 10 Max. size: 10
INSERTEDWHEN	Timestamp of edition		Data type: date Min. size: 10 Max. size: 10
INSERTEDBY	Editor		Data type: string Max. size: 15



## 7 Code lists

### 7.1 Country Code code list

Value	Definition	
AT	Austria	
BE	Belgium	
BG	Bulgaria	
CY	Cyprus	
CZ	Czech Republic	
DE	Germany	
DK	Denmark	
EE	Estonia	
ES	Spain	
FI	Finland	
FR	France	
GB	United Kingdom	
GR	Greece	
HU	Hungary	
IE	Ireland	
IT	Italy	
LT	Lithuania	
LU	Luxembourg	
LV	Latvia	
MT	Malta	
NL	Netherlands	
PL	Poland	
PT	Portugal	
RO	Romania	
SE	Sweden	
SI	Slovenia	
SK	Slovakia	

## 7.2 Station type code list

Value	Definition	Short description
0	Phreatic groundwater (shallow): 0-5 m (inclusive phreatic springs)	
1	Phreatic groundwater (deep)	
1a	5-15 m	
1b	15-30 m	
1c	>30 m	
2	Captive groundwater	
3	Karstic groundwater (inclusive Karstic springs)	
4	River water	
5	Lake/reservoir water	
6	Transitional water	
7	Coastal water	
8	Marine water	

## 7.3 Code lists for Eutrophication parameters

### 7.3.1 Code list for trophic status

Value	Definition	
Ultra-oligotrophic	Ultra-oligotrophic	
Oligotrophic	Oligotrophic	
Mesotrophic	Mesotrophic	
Eutrophic	Eutrophic	
Hypertrophic	Hypertrophic	

### 7.3.2 Eutrophication parameters in rivers

Value	Definition	Measuring unit
P-tot	Total Phosphorus	mg/l P
P-PO <sub>4</sub> <sup>-</sup>	Orthophosphate	mg/l PO <sub>4</sub> <sup>-</sup>
N-tot	Total Nitrogen	mg/l N
NO <sub>3</sub>	Nitrate	mg/l NO <sub>3</sub>
NO <sub>2</sub>	Nitrite	mg/l NO <sub>2</sub>
Chl-a	Chlorophyll-a (average summer period)	µg/l
BOD	Biochemical Oxygen Demand (BOD <sub>5</sub> is preferred)	mg/l
DO	Dissolved Oxygen	mg/l

### 7.3.3 Eutrophication parameters in lakes

Value	Definition	Measuring unit
P-tot	Total Phosphorus	mg/l P
P-PO <sub>4</sub> <sup>-</sup>	Orthophosphate	mg/l PO <sub>4</sub> <sup>-</sup>
N-tot	Total Nitrogen	mg/l N
NO <sub>3</sub>	Nitrate	mg/l NO <sub>3</sub>
NO <sub>2</sub>	Nitrite	mg/l NO <sub>2</sub>
Secchi depth	Secchi Depth Transparency	m (meter)
Chl-a	Chlorophyll-a (average summer period)	µg/l
BOD	Biochemical Oxygen Demand (BOD <sub>5</sub> is preferred)	mg/l
DO	Dissolved Oxygen	mg/l

### 7.3.4 Eutrophication parameters in transitional and coastal water

Value	Definition	Measuring unit
P-tot	Total Phosphorus	mg/l P
P-PO <sub>4</sub> <sup>-</sup>	Orthophosphate	mg/l PO <sub>4</sub> <sup>-</sup>
N-tot	Total Nitrogen	mg/l N
NO <sub>3</sub>	Nitrate	mg/l NO <sub>3</sub>
NO <sub>2</sub>	Nitrite	mg/l NO <sub>2</sub>
Chl-a	Chlorophyll-a (average summer period)	µg/l
DO	Dissolved Oxygen	mg/l

### 7.3.5 Eutrophication parameters in marine water

Value	Definition	Measuring unit
P-tot	Total Phosphorus	mg/l P
P-PO <sub>4</sub> <sup>-</sup>	Orthophosphate	mg/l PO <sub>4</sub> <sup>-</sup>
N-tot	Total Nitrogen	mg/l N
NO <sub>3</sub>	Nitrate	mg/l NO <sub>3</sub>
NO <sub>2</sub>	Nitrite	mg/l NO <sub>2</sub>
Chl-a	Chlorophyll-a (average summer period)	µg/l
DO	Dissolved Oxygen	mg/l
DIN	Dissolved inorganic Nitrogen	µg/l
DIP	Dissolved inorganic Phosphorus	µg/l



## **Part 2**

**Reporting templates  
for summary tables  
on water quality**

## 8 Summary tables on water quality

### 8.1 Groundwater monitoring network:

#### Number of groundwater monitoring points

	Previous reporting period	Current reporting period	Common points
Phreatic groundwater (0-5m)			
Phreatic groundwater (5-15 m)			
Phreatic groundwater deep (15-30 m)			
Phreatic groundwater > 30m			
Captive groundwater			
Karstic groundwater			

#### Quality classes for average nitrate concentrations (mg NO<sub>3</sub>/L) in groundwater (% of sampling points)

	% of points mg nitrate / L			
	< 25	25-39.99	40-50	>50
Phreatic groundwater (0-5m)				
Phreatic groundwater (5-15 m)				
Phreatic groundwater deep (15-30 m)				
Phreatic groundwater > 30m				
Captive groundwater				
Karstic groundwater				

#### Quality classes for maximum nitrate concentrations (mg NO<sub>3</sub>/L) in groundwater (% of sampling points)

	% of points mg nitrate / L			
	< 25	25-39.99	40-50	>50
Phreatic groundwater (0-5m)				
Phreatic groundwater (5-15 m)				
Phreatic groundwater deep (15-30 m)				
Phreatic groundwater > 30m				
Captive groundwater				
Karstic groundwater				

#### Trend classes between previous and current monitoring period for NO<sub>3</sub>

(NO <sub>3</sub> ) Trend	Change in concentration
Strong increase	> +5 mg/l
Weak increase	+1 to +5 mg/l
Stable	-1 to +1 mg/l
Weak decrease	-1 to -5 mg/l
Strong decrease	< -5 mg/l

Trends in groundwater for NO<sub>3</sub> concentrations based on average values.  
(% of sampling points)

	% of points (mg/L)				
	< - 5	-5 to -1	-1 to + 1	+1 to +5	> +5
Phreatic groundwater (0-5m)					
Phreatic groundwater (5-15 m)					
Phreatic groundwater deep (15-30 m)					
Phreatic groundwater > 30m					
Captive groundwater					
Karstic groundwater					

Trends in groundwater for NO<sub>3</sub> concentrations based on maximum values.  
(% of sampling points)

	% of points (mg/L)				
	< - 5	-5 to -1	-1 to + 1	+1 to +5	> +5
Phreatic groundwater (0-5m)					
Phreatic groundwater (5-15 m)					
Phreatic groundwater deep (15-30 m)					
Phreatic groundwater > 30m					
Captive groundwater					
Karstic groundwater					

## 8.2 Surface water monitoring network rivers and lakes:

### Number of monitoring stations for NO<sub>3</sub> concentrations

Water bodies	Previous reporting period	Current reporting period	Common points
Rivers			
Lakes			

### Quality classes for nitrate concentrations (mg NO<sub>3</sub>/L) in rivers and lakes (% of sampling points)

	Quality classes (mg NO <sub>3</sub> /L)					
	0- 1.99	2- 9.99	10-24.99	25-39.99	40-50	> 50
Rivers annual average						
Rivers winter average						
Rivers maximum						
Lakes annual average						
Lakes winter average						
Lakes maximum						

### Trends classes between previous and current monitoring periods for NO<sub>3</sub>

(NO <sub>3</sub> ) Trend	Change in concentration for rivers and lakes
Strong increase	> +5 mg/l
Weak increase	+1 to +5 mg/l
Stable	-1 to +1 mg/l
Weak decrease	-1 to -5 mg/l
Strong decrease	< -5 mg/l

### Trends in surface water NO<sub>3</sub> concentrations based on, winter and annual average data, and maxima (% of common sampling points)

Water bodies	% of points (mg/L)				
	< - 5	-5 to -1	-1 to + 1	+1 to +5	> +5
Rivers annual average					
Rivers winter average					
Rivers maximum					
Lakes annual average					
Lakes winter average					
Lakes maximum					

### Number of stations where eutrophication phenomena are noted

Water bodies	Monitoring period	
	Previous period	Current period
Rivers		
Lakes		

**Quality classes on the trophic state for rivers and lakes (% of sampling points)**

	% of points				
	Ultra-Oligotrophic	Oligotrophic	Mesotrophic	Eutrophic	Hypertrophic
<b>Rivers</b>					
<b>Lakes</b>					

**Trends in surface water for Eutrophication \* (% of common sampling points)**

	% of points (mg/L)				
	strong increase	weak increase	stable	weak decrease	strong decrease
<b>Rivers</b>					
<b>Lakes</b>					

\* Indicate which parameters and which classification have been used for this table.

### 8.3 Surface water monitoring network for transitional, coastal and marine waters.

#### Number of monitoring stations for NO<sub>3</sub> concentrations

Water bodies	Previous reporting period	Current reporting period	Common points
Transitional			
Coastal			
Marine			

#### Quality classes\* for nitrate concentrations (mg NO<sub>3</sub>/L) in transitional, coastal and marine waters (% of sampling points)

	Quality classes (mg NO <sub>3</sub> /L) *					
Transitional annual average						
Transitional winter average						
Transitional maximum						
Coastal annual average						
Coastal winter average						
Coastal maximum						
Marine annual average						
Marine winter average						
Marine maximum						

\* Reference values for NO<sub>3</sub> differ for the Mediterranean Sea area, the Baltic sea area and the North sea area. Please indicate the classification values which have been used.

#### Trends classes\* between previous and current monitoring periods for NO<sub>3</sub> (\*\*)

(NO <sub>3</sub> -) Trend	Change in concentration for transitional, coastal and marine water
Strong increase	*1
Weak increase	*2
Stable	*3
Weak decrease	*4
Strong decrease	*5

\* Indicate the values for the trend classes which have been used for NO<sub>3</sub> in transitional, coastal and marine water

\*\* If the classification can not be applied for all the various water bodies (transitional, coastal and marine water), make separate tables.

**Trends in surface water NO<sub>3</sub> concentrations based on, winter and annual average data, and maxima (% of common sampling points)(\*\*)**

Water bodies	% of points (mg/L)				
	*1	*2	*3	*4	*5
Transitional annual average					
Transitional winter average					
Transitional maximum					
Coastal annual average					
Coastal winter average					
Coastal maximum					
Marine annual average					
Marine winter average					
Marinemaximum					

\* Indicate the % of stations based on the trend classes you used in the previous table.

\*\* If different classification classes have been used for the various water bodies, split the table.

**Number of stations where eutrophication phenomena are noted**

Water bodies	Monitoring period	
	Previous	Current
Transitional		
Coastal		
Marine		

**Quality classes on the trophic state for transitional, coastal and marine water (% of sampling points)**

	% of points				
	Ultra-Oligotrophic	Oligotrophic	Mesotrophic	Eutrophic	Hypertrophic
Transitional					
Coastal					
Marine					

**Trends in transitional, coastal and marine water for Eutrophication \* (% of common sampling points)**

Water bodies	% of points (mg/L)				
	strong increase	weak increase	stable	weak decrease	strong decrease
Transitional					
Coastal					
Marine					

\*Indicate which parameters and which classification have been used for this table

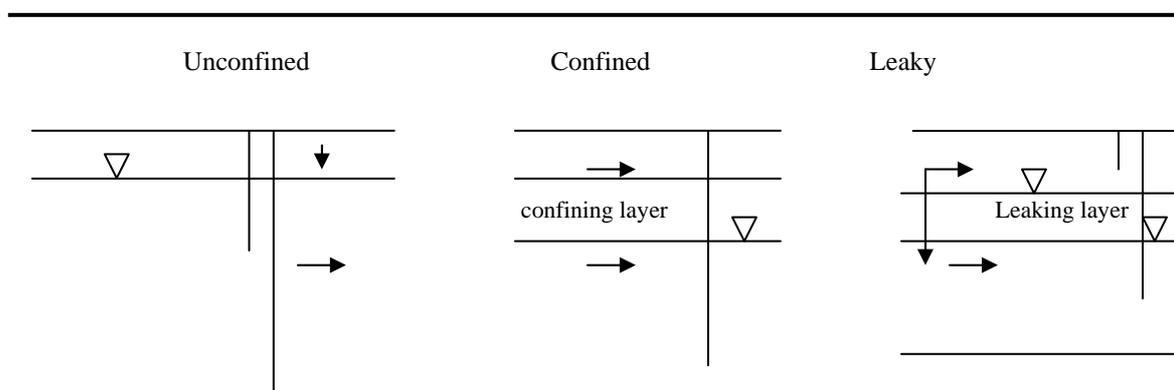
**Reference to paragraph 3.1.2.1 of the guidelines for the monitoring required under the Nitrates Directive for the as referred to in table 3.1 of this annex**

**3.1.2.1. Sampling Site Selection**

Member States should choose their groundwater sampling points so as to get a representative picture of nitrate concentrations in their groundwaters. The selection of sampling points will depend on land use and hydrogeological conditions (i.e., pressures and groundwater vulnerability). Both shallow and deep groundwater should be included in the monitoring network. However, shallow groundwater is more susceptible to changes in solute concentrations than deeper groundwater.

The design and operation of the monitoring programme should be appropriate to the land use, physical conditions and the type of aquifer, i.e. based on a conceptual model. For example, both the upper and lower parts of the aquifers that are connected to the soil should be sampled, as the upper parts (the first 5 metres of the saturated zone) will tend to respond quickest to changes in agricultural practice, especially where there is a shallow unsaturated zone. A large variability in nitrate concentrations is expected in the upper parts than in deeper parts of the aquifer, indicating that at least three observation wells could be needed to obtain an average nitrate concentration. It is also important to monitor nitrate concentrations in the upper saturated zone of aquifers where they drain directly into rivers and other surface waters, as this groundwater can be a major source of nitrates to these surface waters. In addition to sampling from boreholes, monitoring of springflows and stream baseflow (low flow) can be appropriate in certain hydrogeological settings. Samples from the deeper parts of aquifers can give an indication of long term trends. Captive groundwater that is not in direct contact with the upper soil can be sampled at one single point, selected so that it represents the aquifer water quality (e.g., a large spring).

It is important for deep groundwater that the sampling is carried out along the flowpath from recharge areas to discharge areas and not only at possible groundwater extraction points. The number of wells from recharge areas to groundwater will depend on the complexity of the hydrogeology of the recharge areas. As a basis for planning sampling sites and monitoring schemes in general, it would be advisable to establish a conceptual model including the recharge and discharge areas for important groundwater bodies. The most vulnerable areas for pollution are the recharge areas, and areas with thin soil cover (e.g. unconfined groundwater) (**Fig. 1**).



**Fig. 1.** Conceptual model of flow in unconfined, confined and leaky aquifers with suggested location of observation wells and possible direction of flowlines. The unconfined aquifer receives water directly from the saturated zone, the confined aquifer does not receive the water from the upper soil zone, and leaky aquifer receives part of the water from the uppermost soil layer.

Existing groundwater monitoring network in Member States could be used as far as possible. The sampling should, if possible, be connected to other monitoring programmes (e.g. WFD). For deep groundwater, it makes sense to make use of existing public supply boreholes and supplement these with additional points where it is necessary to do so to obtain a representative coverage. Care should be taken when sampling from non public water supply boreholes which low abstraction levels and limited lateral movement in the aquifer. In observation wells with limited or no groundwater extraction, water samples should be taken after 3-4 hours pumping or when the water quality reaches a constant value (e.g. a constant electrical conductivity, pH or oxygen).