



VIETNAM MINISTRY OF NATURAL RESOURCES AND ENVIROMENT



WATER QUALITY MONITORING STANDARDS

PHAN MAI LINH

Department of Water Resources Management

linhphanmai@yahoo.com.vn



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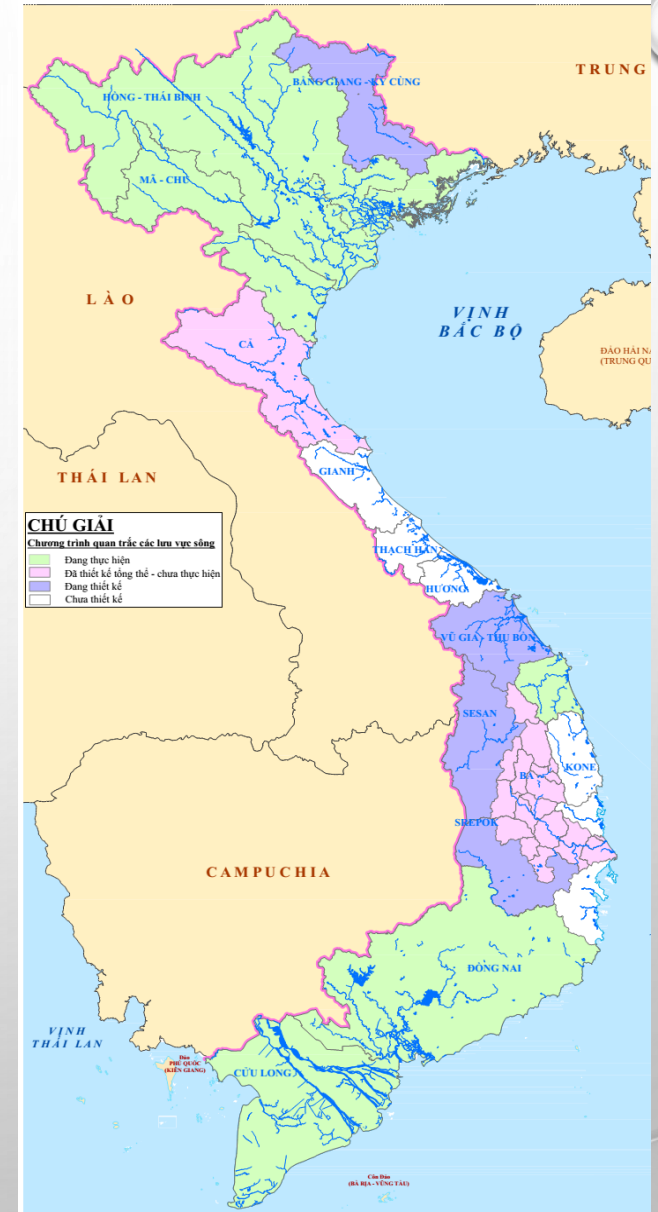


OVERVIEW ON WATER QUALITY MONITORING NETWORK IN VIETNAM

1. SURFACE WATER QUALITY MONITORING NETWORK

1.1. central level - MONRE

- VEPA – VIETNAM ENVIRONMENTAL PROTECTION AGENCY
- **PERIODIC ENVIRONMENTAL MONITORING** IN MAIN RIVER BASINS: CAU, NHUE DAY, HONG-THAI BINH, DA, MA, VU GIA – THU BON, DONG NAI, EAST-SOUTHERN REGION.
- 224 MONITORING STATIONS
- FREQUENCY: 3-6 TIMES/YEAR
- PARAMETER: 21 priority parameters and 05 supplement parameters (pesticides, grease, cyanua, Hg, as)



1. SURFACE WATER QUALITY MONITORING NETWORK

1.1. central level - MONRE

- **AUTOMATIC AND CONTINUOUS WATER quality MONITORING:**
7 stations (hanoi, ha nam, thai nguyen, bac ninh, hue, binh duong)
- Setting up more 17 stations in nhue – day and dong nai river basins (world bank project)



1. SURFACE WATER QUALITY MONITORING NETWORK

1.2. provincial level - DONREs

- Centers for environmental monitoring (belonging to donres)
- MONITORING STATIONS: located in main rivers, cities, urban areas, industrial zones, sensitive aquatic areas
- FREQUENCY: 4 TIMES/YEAR

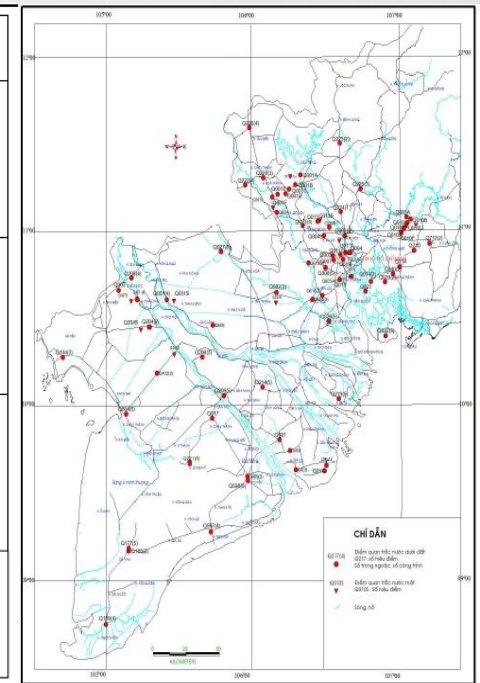
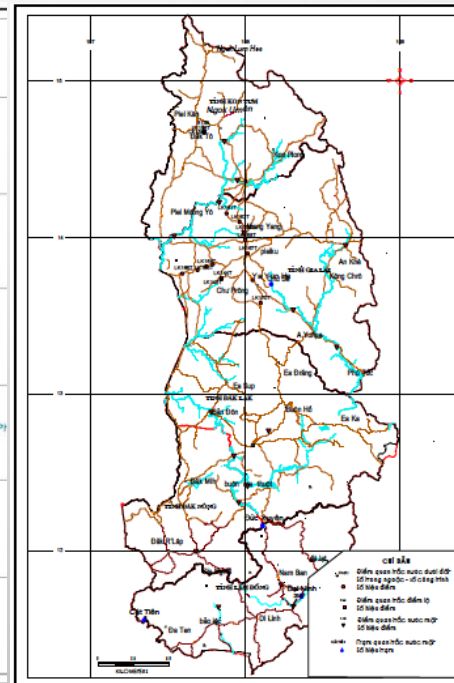
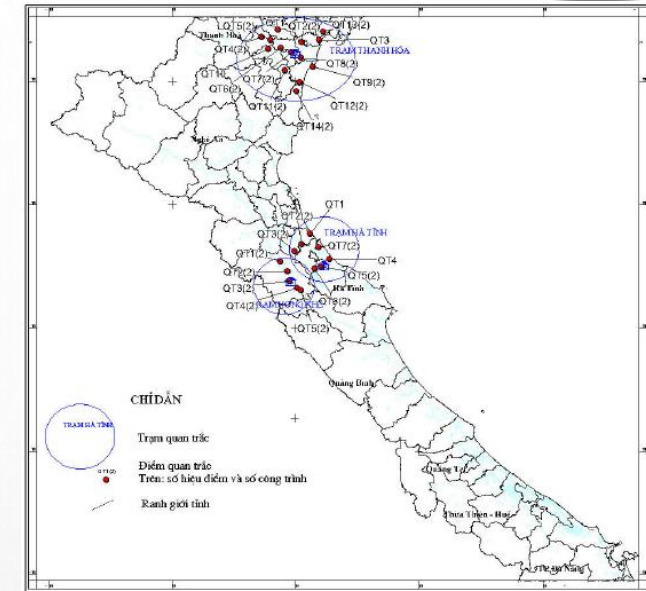
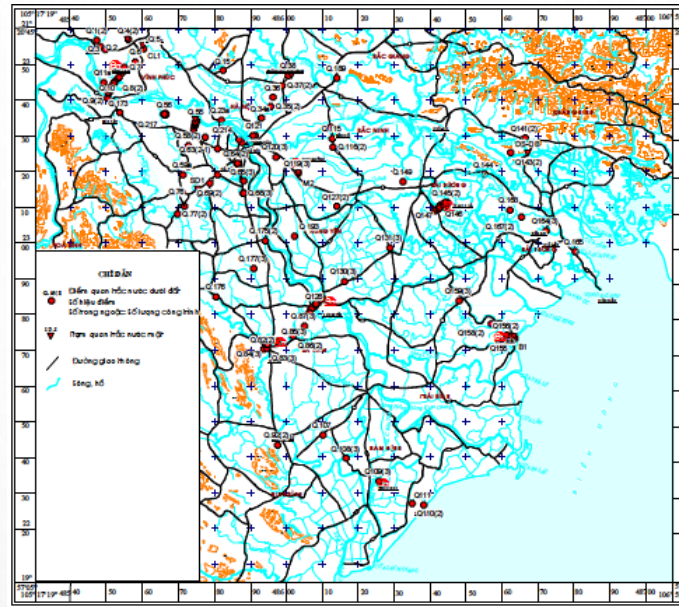


2. Underground WATER QUALITY MONITORING NETWORK

- central level - MONRE & provincial level
- donres

Central level: 5 regions: northern region (198 stations, since 1988), north central region (46 stations, since 3/2011), south central coast (41 stations, since 2010-2010), highland region (204 stations, since 1991), southern region (216 stations, since 1991)

Provincial level: hochiminh (28), binh duong (10), can tho (30)...



WATER QUALITY STANDARDS IN VIETNAM

1. SURFACE WATER QUALITY STANDARD QCVN 08-MT/2015-BTNMT

- **Classification:** A1, A2, B1, B2.
- **Parameters:** 32

25	Phenol (tổng số)	mg/l	0,005	0,005	0,01	0,02
26	Hoá chất bảo vệ thực vật Clo hữu cơ					
	Aldrin+Dieldrin	µg/l	0,002	0,004	0,008	0,01
	Endrin	µg/l	0,01	0,012	0,014	0,02
	BHC	µg/l	0,05	0,1	0,13	0,015
	DDT	µg/l	0,001	0,002	0,004	0,005
	Endosulfan (Thiodan)	µg/l	0,005	0,01	0,01	0,02
	Lindan	µg/l	0,3	0,35	0,38	0,4
	Chlordane	µg/l	0,01	0,02	0,02	0,03
	Heptachlor	µg/l	0,01	0,02	0,02	0,05
27	Hoá chất bảo vệ thực vật phospho hữu cơ					
	Paration	µg/l	0,1	0,2	0,4	0,5
	Malation	µg/l	0,1	0,32	0,32	0,4
28	Hóa chất trừ cỏ					
	2,4D	µg/l	100	200	450	500
	2,4,5T	µg/l	80	100	160	200
	Paraquat	µg/l	900	1200	1800	2000
29	Tổng hoạt độ phóng xạ α	Bq/l	0,1	0,1	0,1	0,1
30	Tổng hoạt độ phóng xạ β	Bq/l	1,0	1,0	1,0	1,0
31	E. Coli	MPN/100ml	20	50	100	200
32	Coliform	MPN/100ml	2500	5000	7500	10000

TT	Thông số	Đơn vị	Giá trị giới hạn			
			A		B	
			A1	A2	B1	B2
1	pH		6-8,5	6-8,5	5,5-9	5,5-9
2	Ôxy hoà tan (DO)	mg/l	≥ 6	≥ 5	≥ 4	≥ 2
3	Tổng chất rắn lơ lửng (TSS)	mg/l	20	30	50	100
4	COD	mg/l	10	15	30	50
5	BOD ₅ (20°C)	mg/l	4	6	15	25
6	Amoni (NH ₄ ⁺) (tính theo N)	mg/l	0,1	0,2	0,5	1
7	Clorua (Cl ⁻)	mg/l	250	400	600	-
8	Florua (F ⁻)	mg/l	1	1,5	1,5	2
9	Nitrit (NO ₂ ⁻) (tính theo N)	mg/l	0,01	0,02	0,04	0,05
10	Nitrat (NO ₃ ⁻) (tính theo N)	mg/l	2	5	10	15
11	Phosphat (PO ₄ ³⁻) (tính theo P)	mg/l	0,1	0,2	0,3	0,5
12	Xianua (CN ⁻)	mg/l	0,005	0,01	0,02	0,02
13	Asen (As)	mg/l	0,01	0,02	0,05	0,1
14	Cadimi (Cd)	mg/l	0,005	0,005	0,01	0,01
15	Chì (Pb)	mg/l	0,02	0,02	0,05	0,05
16	Crom III (Cr ³⁺)	mg/l	0,05	0,1	0,5	1
17	Crom VI (Cr ⁶⁺)	mg/l	0,01	0,02	0,04	0,05
18	Đồng (Cu)	mg/l	0,1	0,2	0,5	1
19	Kẽm (Zn)	mg/l	0,5	1,0	1,5	2
20	Niken (Ni)	mg/l	0,1	0,1	0,1	0,1
21	Sắt (Fe)	mg/l	0,5	1	1,5	2
22	Thủy ngân (Hg)	mg/l	0,001	0,001	0,001	0,002
23	Chất hoạt động bề mặt	mg/l	0,1	0,2	0,4	0,5
24	Tổng dầu, mỡ (oils & grease)	mg/l	0,01	0,02	0,1	0,3

WATER QUALITY STANDARDS IN VIETNAM

2. GROUNDWATER QUALITY STANDARD QCVN 09-MT/2015-BTNMT

- Classification: 1
- Parameters: 26

TT	Thông số	Đơn vị	Giá trị giới hạn
1	pH	-	5,5 - 8,5
2	Độ cứng (tính theo CaCO ₃)	mg/l	500
3	Chất rắn tổng số	mg/l	1500
4	COD (KMnO ₄)	mg/l	4
5	Amôni (tính theo N)	mg/l	0,1
6	Clorua (Cl ⁻)	mg/l	250
7	Florua (F ⁻)	mg/l	1,0
8	Nitrit (NO ₂ ⁻) (tính theo N)	mg/l	1,0
9	Nitrat (NO ₃ ⁻) (tính theo N)	mg/l	15
10	Sulfat (SO ₄ ²⁻)	mg/l	400
11	Xianua (CN ⁻)	mg/l	0,01
12	Phenol	mg/l	0,001
13	Asen (As)	mg/l	0,05
14	Cadimi (Cd)	mg/l	0,005
15	Chì (Pb)	mg/l	0,01
16	Crom VI (Cr ⁶⁺)	mg/l	0,05
17	Đồng (Cu)	mg/l	1,0
18	Kẽm (Zn)	mg/l	3,0
19	Mangan (Mn)	mg/l	0,5
20	Thủy ngân (Hg)	mg/l	0,001
21	Sắt (Fe)	mg/l	5
22	Selen (Se)	mg/l	0,01
23	Tổng hoạt độ phóng xạ α	Bq/l	0,1
24	Tổng hoạt độ phóng xạ β	Bq/l	1,0
25	E - Coli	MPN/100ml	Không phát hiện thấy
26	Coliform	MPN/100ml	3

REGULATIONS ON WATER QUALITY MONITORING

CIRCULAR NO. 24/2017/TT-BTNMT DATED SEPTEMBER 01, 2017 OF MONRE
ON ENVIRONMENTAL MONITORING TECHNIQUES

SURFACE WATER MONITORING

- **Parameters:** temperature, pH, DO, EC, TDS, ORP, turbidity, salinity, color, alkalinity, total hardness, TSS, BOD₅, COD, TOC, NH₄⁺, NO₂⁻, NO₃⁻, SO₄²⁻, PO₄³⁻, CN⁻, Cl⁻, F⁻, S²⁻, total N, total P, Na, K, Ca, Mg, Fe, Mn, Cu, Zn, Ni, Pb, Cd, As, Hg, total Cr, Cr (VI), coliform, E.Coli, total oil, grease; total phenols, chlorinated organic pesticides, phosphorus organic pesticides, total radioactivity α , total radioactivity β , total polycarbobiphenyl (PCB), total dioxin/furan (PCDD/PCDF), dioxin-like polychlorinated biphenyls (dl-PCB), phytoplankton, zooplankton, zoobenthos, surfactants. **The monitoring parameters shall be determined according to the monitoring objectives, applicable national technical regulations on environment and competent authorities' requirements.**
- **Frequency:** at least 06 times per year, every 02 months.

MONITORING METHODS

Field sampling and measurement

No.	Types of samples	Code of method
1.	River water, stream water	• TCVN 6663-6:2008
2.	Lake water	• TCVN 5994:1995
3.	Microbiological sample	• TCVN 8880:2011
4.	Phytoplankton	• SMEWW 10200B:2012
5.	Zooplankton	• SMEWW 10200B:2012
6.	Zoobenthos	• SMEWW 10500B:2012

No.	Parameters	Code of method
1.	Temperature	• SMEWW 2550B:2012
2.	pH	• TCVN 6492:2011
3.	DO	• TCVN 7325:2004
4.	EC	• SMEWW 2510B:2012
5.	Turbidity	• TCVN 6184:2008; • SMEWW 2130B:2012
6.	TDS	• Use of direct measuring equipment
7.	ORP	• SMEWW 2580B:2012; • ASTM 1498:2008
8.	Salinity	• SMEWW 2520B:2012

Preservation and transport of samples TCVN 6663-3:2008

Laboratory analysis methods shall be selected in accordance with the equivalent applicable national technical regulations

GROUND WATER MONITORING

- **Parameters:** temperature, pH, DO, EC, TDS, ORP, turbidity, salinity, color, alkalinity, total hardness, TSS, BODs, COD, permanganate index, NH_4^+ , PO_4^{3-} , NO_2^- , NO_3^- , HCO_3^- , SO_4^{2-} , CO_3^{2-} , CN^- , Cl^- , F^- , S^{2-} , total N, total P, Fe, Mn, Pb, Cu, Zn, Ni, Cd, As, Hg, Se, Al, total Cr, Cr (VI), Co, coliform, E.Coli, total oil, grease; total phenols, total radioactivity α , total radioactivity β , PAHs, chlorinated organic pesticides, phosphorus organic pesticides, total polycarbobiphenyl (PCB), total dioxin/furan (PCDD/PCDF), dioxin-like polychlorinated biphenyls (dl-PCB), surfactants. **The monitoring parameters shall be determined according to the monitoring objectives, applicable national technical regulations on environment and competent authorities' requirements.**
- **Frequency:** at least 04 times per year, every 03 months.

MONITORING METHODS – UNDERGROUND WATER

Field sampling and measurement

Field sampling: TCVN 666311:2011

Field measurement

No.	Parameters	Code of method
1.	Temperature	• SMEWW 2550B:2012
2.	pH	• TCVN 6492:2011; • SMEWW 4500 H ⁺ B:2012
3.	DO	• TCVN 7325:2004; • SMEWW 4500O.G:2012
4.	EC	• SMEWW 2510B:2012
5.	TDS	• Use of direct measuring equipment
6.	Turbidity	• TCVN 6184:2008; • SMEWW 2130B:2012
7.	ORP	• SMEWW 2580B:2012; • ASTM 1498:2008
8.	Salinity	• SMEWW 2520B:2012

Preservation and transport of samples TCVN 6663-3:2008

Laboratory analysis methods shall be selected in accordance with the equivalent applicable national technical regulations



**QUALITY ASSURANCE AND QUALITY CONTROL IN PERIODIC
ENVIRONMENTAL MONITORING**

- 1. Quality Assurance in Design of Environmental Monitoring Program**
 - 2. Quality Assurance and Quality Control in Field Monitoring**
 - 3. Quality Assurance and Quality Control in Environmental Analysis**
 - 4. Quality Assurance and Quality Control in Data Management and Preparation of Monitoring Result Report**
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CHALLENGES

- 1. Lack of Budget for adequate water quality monitoring networks**
- 2. Lack of effective monitoring data sharing mechanism and networks
(central – provincial levels)**
- 3. Capacity limitations of labs at provincial level**
- 4. Water quality standards (lots of parameters, strict thresholds for irrigation use)**

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Thank you very much for your attention!

linhphanmai@yahoo.com.vn

