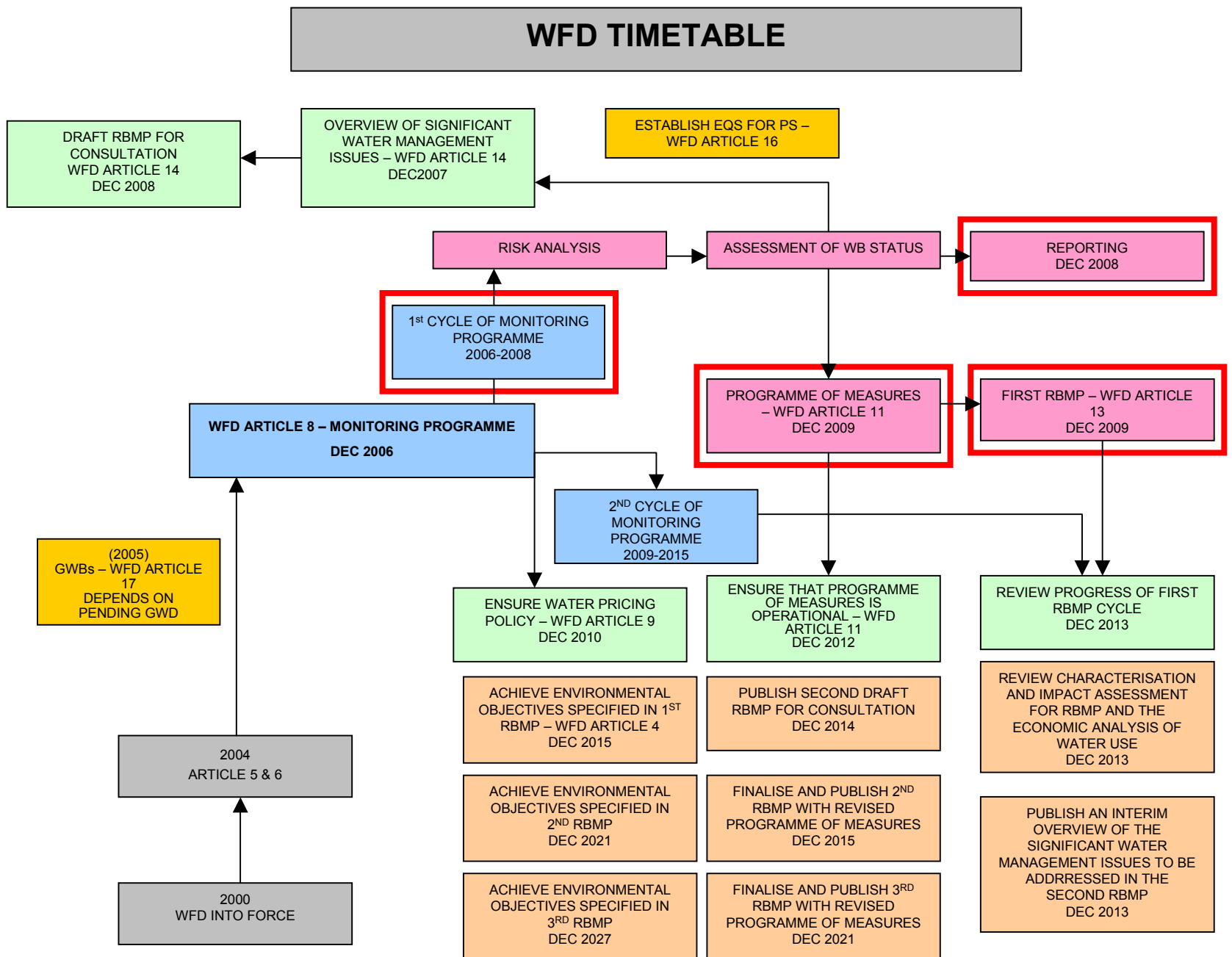
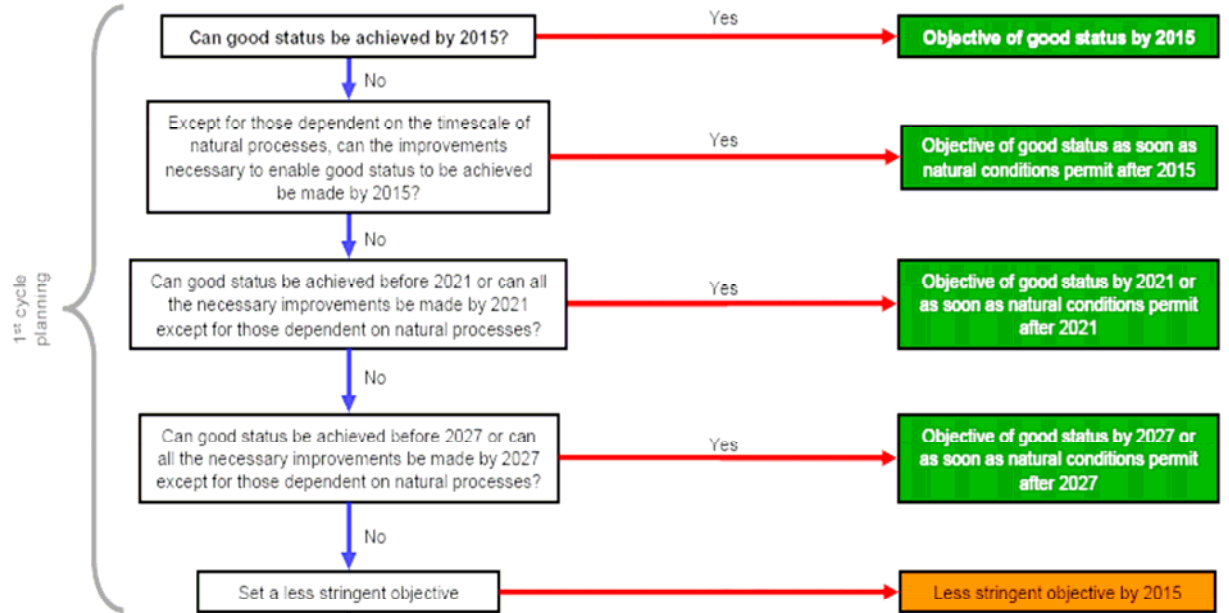


WFD TIMETABLE

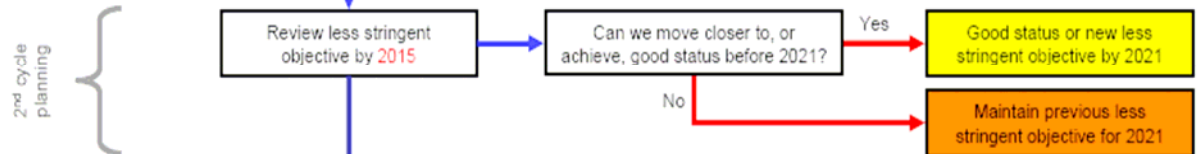


WFD TIMETABLE

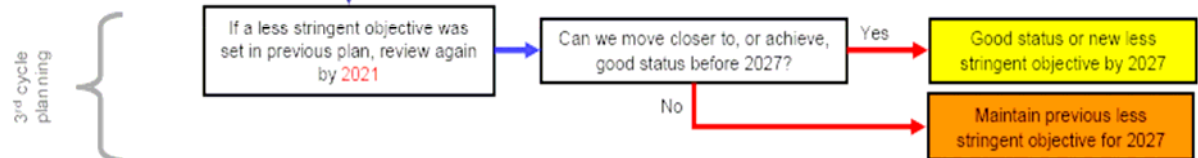
2009-2015



2015-2021



2021-2027



WFD AND OTHER WATER RELATED DIRECTIVES

DIRECTIVES THAT WILL BE REPEALED BY WFD IN PHASES:

UNTIL 2007

- ✓ SURFACE WATER ABSTRACTION DIRECTIVE – 75/440/EEC
- ✓ EXCHANGE OF INFORMATION ON SURFACE WATER DECISION – 77/795/EEC
- ✓ SURFACE WATER ABSTRACTION MEASUREMENT / ANALYSIS DIRECTIVE – 79/869/EEC

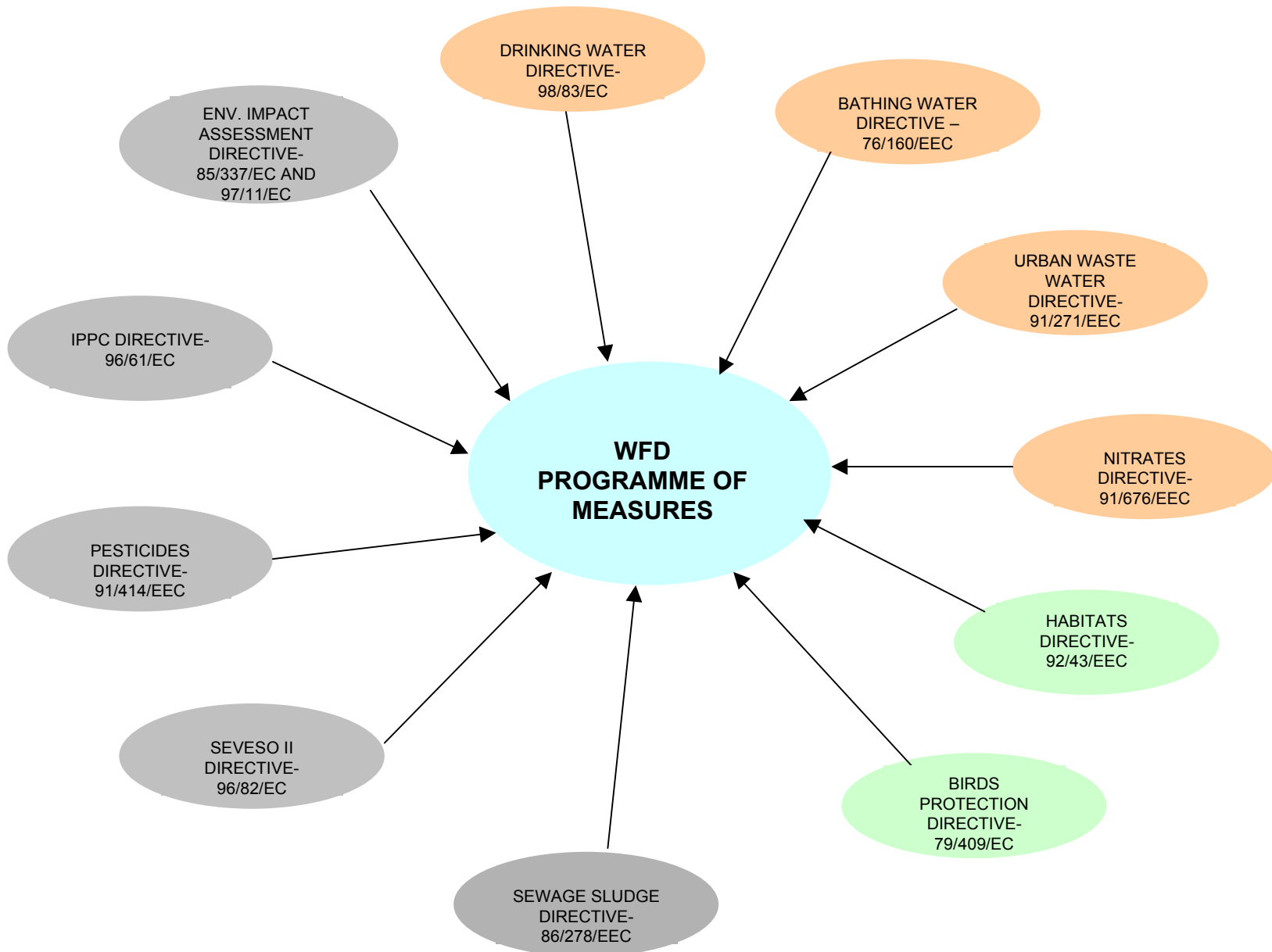
UNTIL 2013

- ✓ FRESHWATER FISH DIRECTIVE – 78/659/EEC
- ✓ SHELLFISH WATERS DIRECTIVE – 79/923/EEC
- ✓ GROUNDWATER DIRECTIVE – 80/68/EEC – TO BE REPLACED BY NEW (NOW IN DRAFT)
- ✓ DANGEROUS SUBSTANCES DIRECTIVE 76/464/EEC

DIRECTIVES THAT WILL REMAIN IN PARALLEL WITH WFD:

- ✓ Bathing waters Directive 76/160/EEC and the new Directive 2006/7/EC
- ✓ Nitrates from agricultural sources 91/676/EEC
- ✓ Urban Waste Water Treatment 91/271/EEC
- ✓ quality of water intended for human consumption 98/83/EC

CONTRIBUTION OF OTHER DIRECTIVES IN WFD PROGRAMME OF MEASURES (1ST RBMP – END 2009)



WATER RELATED DIRECTIVES INCORPORATED IN DESIGNING OF MONITORING PROGRAMME OF CYPRUS

DIRECTIVES		FULLY INCORPORATED	PARTIALLY INCORPORATED	NOT INCORPORATED
SURFACE DRINKING WATER ABSTRACTION DIRECTIVE – 75/440/EEC AS REPLACED BY WFD ANNEX V §1.3.5 FROM 2007		✓ AS SURVEILLANCE - ADDITIONAL MONITORING		
QUALITY OF WATER INTENDED FOR HUMAN CONSUMPTION 98/83/EC				✓ NOT RELEVANT (REFERS TO TAP WATER QUALITY MONITORING)
EXCHANGE OF INFORMATION ON SURFACE WATER DECISION – 77/795/EEC		✓		
FRESHWATER FISH DIRECTIVE – 78/659/EEC			✓	
DANGEROUS SUBSTANCES DIRECTIVE 76/464/EEC		✓		
GROUNDWATER DIRECTIVE – 80/68/EEC – TO BE REPLACED BY NEW (NOW IN DRAFT)		✓		
BATHING WATERS DIRECTIVE 76/160/EEC and DIRECTIVE 2006/7/EC				✓
NITRATES FROM AGRICULTURAL SOURCES 91/676/EEC			✓	
URBAN WASTE WATER TREATMENT 91/271	FOR THE DESIGNATION OF SENSITIVE ZONES		✓	
	NOT RELEVANT (REFERS TO EFFLUENT OF WWTP)			✓

For integration reasons in the action plan (Activity 2.4) every effort will be made to include additional to WFD parameters for other Directives in samples taken in order to avoid double sampling at the same station, at the same period

WFD Groundwater Monitoring

- A “**groundwater level monitoring**” network to assess risks of failing to achieve good groundwater quantitative status (With estimates of recharge and appropriate conceptual model / understanding for quantitative status).
- A “**chemical status monitoring**”:

“ Surveillance ”:	“ Operational ”:
▪ Assess characterization and risks of failing to achieve good chemical status	▪ Status of GWB being “AT RISK”
▪ Status of GWB, not being at risk	▪ Significant / sustained presence of upward trends of any pollutant
▪ Pollutants long term trends (natural and due to human activities)	

WFD (Annex V) Objectives of GWT monitoring

- reliable assessment of quantitative status
- supplement /validate impact assessment procedure
- assess long term trends
- establish chemical status of GWBs “at risk”
- establish trends in pollutants, and,
- assess the reversal of such trends

Key design principles of programmes

- On the basis of the results of the WFD Annex II characterisation and risk assessment procedure.
- Amount of monitoring to be proportional to the difficulty in judging:
 - (a) status of a groundwater body,
 - (b) presence of adverse trends, and
 - (c) the implications of errors in such judgements

Basis of design / operation of monitoring programmes for each GWB

- Objectives applying to it
- Its characteristics
- Existing level of understanding of GWB
- Type, extent and range of the pressures on the GWB
- Confidence in assessment of risk from pressures on GWB, and
- Level of confidence required in the assessment of risk.

Design Considerations:

1. QUANTITATIVE monitoring

WHAT: Mainly groundwater level (but also flow of springs, river base-flows, abstraction and precipitation when required for understanding of GWB system).

WHERE: Depends on needs for understanding and predictions it provides. Spatial variability in GWB flow system or the pressures on it, control the density of monitoring points. WFD requires level monitoring effort to be focused on GWBs “at risk”.

WHEN: Monitoring frequency to allow short- and long-term level variations to be detected. Variability of groundwater level or rapid response to pressures requires higher frequency.

Design Considerations:

2. **SURVEILLANCE monitoring** (As per WFD Annex II characterisation and risk assessment)

WHAT: O₂, pH, NO₃, NH₄ and conductivity (Additional per purpose, pressures and risk assessments).

WHEN: Surveillance for each RBM Plan (6 years).

- No minimum duration is specified. For first RBM Plan, MS with extensive GWB networks may only need a short period of surveillance to help design operational monitoring programmes.

Frequency of monitoring as per understanding of GWB system, characteristics and understanding of fate/ behaviour of pollutants.

At least once a year for trend assessment.

Design Considerations:

3. **OPERATIONAL monitoring** (must be on the basis of the **RISK assessment and refinement from surveillance**)

WHERE: Operational monitoring is exclusively on GWBs at risk. Sites based on GWB system, key pressures – at Risk;

WHAT: Indicators of pollutants causing the GWB to be at risk. Generally, both core and selective determinants will be required at each site.

WHEN: Sampling for periods between surveillance to detect impacts, but at a minimum of once per annum (suggested quarterly to annual). To continue until GWB be no longer at poor status or at risk (adequate data demonstrating reversal of trends).

The GWB characterization

Grouped into 20 GWBs (lithology, hydraulic characteristics, pressures and importance).

GWBs at RISK of not meeting WFD quality objectives are 14 + Troodos based on:

- deficient water balance
- pressure due urban population-sewage
- Agricultural activity pressures - pollution due to nutrients (nitrogen and phosphorus), oxygen demanding compounds (BOD, COD) and pesticides.

JUSTIFICATION FOR SELECTION OF SITES, PARAMETERS AND FREQUENCY:

QUANTITATIVE PROGRAMME

SITES: Overpumping, Artificial Recharge, Sea Intrusion, not a well defined aquifer system, Karstification,

PARAMETERS: Overpumping, Artificial Recharge, Sea Intrusion, not a well defined aquifer system, Karstification, ecosystem

FREQUENCY: Type of aquifer (phreatic – semiconfined – confined –karstic) , permeability

SURVEILLANCE AND OPERATIONAL

SITES AND PARAMETERS: Sea Intrusion, Water Supply, degree of Vulnerability, Diffuse pollution, Urbanization, Agriculture, Industrial, Artificial Recharge (treated effluent), Karstification, natural high elements (B, SO₄, Chloride, F, Mg)

FREQUENCY: Type of aquifer (phreatic – semiconfined – confined –karstic) , permeability

GROUNDWATER BODIES MONITORING PROGRAMME

EXTENDED MONITORING PROGRAMME

	Quantitative	Surveillance	Operational
No of sites	96	96	81
ON AVERAGE EACH SITE CORRESPONDS TO ABOUT 56km ² OF AQUIFER AREA (67 km ² IN OPERATIONAL)			

BASIC MONITORING PROGRAMME

	Quantitative	Surveillance	Operation
No of sites	78	78	63
ON AVERAGE EACH SITE CORRESPONDS TO ABOUT 69km ² OF AQUIFER AREA (86 km ² IN OPERATIONAL)			

GENERAL PRINCIPLES:

WFD REQUIREMENTS

BETTER REPRESENTATION OF GWBs

BETTER REPRESENTATION OF WB TYPES THREE OR MORE

MONITORING SITES PER GWB

FOCUSSED ON AS MANY OF THE EXISTING MONITORING STATIONS

AS POSSIBLE

SITES FOCUSED ON 'LOCAL' MONITORING OF LEVELS AND FLOWS

ECOSYSTEMS.

CHANGE OF GROUNDWATER FLOW DIRECTION (INTRUSION),

RAINFALL, RECHARGE

HIGHER FREQUENCY OF MONITORING

SURVEILLANCE, SAME AS FOR BASIC BUT WITH MORE POINTS FOR

BODIES AT RISK AND THOSE NOT AT RISK. AT LEAST 3 MONITORING

POINTS PER GWB

SUITES OF INORGANIC PARAMETERS TO PROVIDE DATA FOR QA

PURPOSES AND INFORMATION ON THE NATURAL QUALITY

(BASELINE) OF GROUNDWATER AND TEMPERATURE. FURTHER

GENERIC INDICATOR SPECIES ARE ALSO ADDED TO SUPPLEMENT

THE RISK ASSESSMENT PROCESS.

OPERATIONAL SAME AS FOR BASIC

ENOUGH TO OBTAIN ADEQUATE NUMBER OF OBSERVATIONS FOR

RELIABLE STATISTICAL EVALUATIONS AND EVALUATION OF

MEASURES EFFECTIVENESS

✓ WFD REQUIREMENTS

✓ ADEQUATE REPRESENTATION OF GWBs

✓ ADEQUATE REPRESENTATION OF WB TYPES

✓ AT LEAST THREE MONITORING SITES PER GWB

✓ FOCUSED ON AS MANY OF THE EXISTING MONITORING STATIONS

AS POSSIBLE

✓ SITES SUFFICIENT TO VALIDATE THE GWB SYSTEM

✓ WATER LEVELS, SPRING FLOWS, RIVER BASE FLOWS WHEN

GROUNDWATER MAIN SUPPLIER

FREQUENCY SUFFICIENT TO DISTINGUISH SHORT- AND LONG-

TERM VARIATIONS

✓ SURVEILLANCE SITES ON BASIS OF GWB SYSTEM –FATE OF

POLLUTANTS. AT LEAST 3 POINTS IN THE GWB 'NOT AT RISK', WITH

AT LEAST ONE ADDITIONAL IN REMAINING BODIES IN THE GROUP

✓ FOR BODIES 'AT RISK' LOCATIONS SHOULD IDEALLY COINCIDE WITH OPERATIONAL MONITORING POINTS.

✓ OXYGEN CONTENT, PH VALUE, CONDUCTIVITY, NITRATE,

AMMONIUM, OTHER PARAMETERS INDICATIVE OF THE RISKS TO

AND IMPACTS ON GROUNDWATER FROM PRESSURES IDENTIFIED IN

CHARACTERIZATION PROCESS.

✓ SUFFICIENT POINTS IN BODIES OR GROUPS OF BODIES 'AT RISK'

TO RELIABLY CLASSIFY THE BODIES

✓ FREQUENCY ENOUGH TO OBTAIN ADEQUATE NUMBER OF

OBSERVATIONS FOR RELIABLE STATISTICAL EVALUATIONS AND

EVALUATION OF MEASURES EFFECTIVENESS

GROUNDWATER BODIES MONITORING PROGRAMME

EXTENDED MONITORING PROGRAMME

QUANTITATIVE (96 sites)	
1: Monthly	43 sites
2: Quarterly	32 sites
3: Biannually	21 sites
Number of visits	686

SURVEILLANCE (96 sites)	
1: Quarterly	13 sites
2: Biannually	68 sites
3: Annually	15 sites
Number of visits	203

OPERATIONAL (81 sites)	
1: Monthly	13 sites
2: Quarterly	62 sites
3: Biannually	6 sites
Number of visits	416

BASIC MONITORING PROGRAMME

QUANTITATIVE (78 sites)	
1: Monthly	24 sites
2: Quarterly	30 sites
3: Biannually	24 sites
Number of visits	456

SURVEILLANCE (78 sites)	
1: Quarterly	7 sites
2: Biannually	34 sites
3: Annually	37 sites
Number of visits	133

OPERATIONAL (63 sites)	
1: Monthly	7 sites
2: Quarterly	31 sites
3: Biannually	25 sites
Number of visits	258

ABOUT 55% MORE VISITS IN EXTENDED MONITORING PROGRAMME

Summary comparison of the two Monitoring Programmes

	Extended Monitoring			Basic Monitoring		
	Quantitative	Surveillance	Operational	Quantitative	Surveillance	Operational
SITES						
Quantitative	96			78		
Qualitative		96	81		78	63
Total	96			78		
GWBs	19	19	15	19	19	15
Total	19			19		
No. OF PARAMETERS						
Quantitative	3			3		
Core		5	5		5	5
Trace elem.		11	11		11	11
Ionic anal.		4	4		4	4
Pesticides		9	9		9	9
Priority sub.+		14	14		14	14
Total 1	3	43	43	3	43	43
No. of data	800	4000	600	600	33000	600
No of samples	203	203	413	137	137	274

DIFFERENCES BETWEEN THE TWO GROUNDWATER PROGRAMS

The Extended approach demands 34% more samplings compared to the Basic one.

Sampling parameters are same for both approaches and are based on pressures exerted on groundwaters.

Sampling frequency is higher in the Extended Program for some of the water bodies, based on the types of pressures they are subject to, their risk status, their protection status and their general importance as aquifers.

Cost factors for the two options of Groundwater monitoring (thousand CY£)

Analysis		Sampling			Hydro-morphology			TOTAL (thousand CY£)
Surv.	Oper.	Surv.	Oper.	Quant.	Surv.	Oper.	Quant.	
EXTENDED								
187.3	407.2	19.8	35.9	56.5	-	-	8.9	715.7
BASIC								
119.8	253.9	13.0	25.2	39.9	-	-	6.1	457.9

GROUNDWATER BODIES MONITORING PROGRAMME

EXTENDED MONITORING PROGRAMME

BASIC MONITORING PROGRAMME

INCORPORATION OF EXISTING MONITORING PROGRAMMES

DIRECTIVE OR DECISION	ST	QE	FR
<p>DANGEROUS SUBSTANCES - 76/464/EEC</p> <p>Directive 80.68/EEC – GW Daughter Directive to be finalized end of 2006.</p>	F	F	F
<p>NITRATES – 91/676/EEC</p> <p>Detection (N) (1 year monitoring), (NVZs)</p> <p>CGAP, Action Programs within NVZ,</p> <p>National monitoring and reporting every 4 years when <25 mg/l or 8 years when no pressures.</p> <p>Assessment of Action Programs impact, Revision of NVZs and Action Programs</p>	P	F	P
<p>URBAN WASTE WATER TREATMENT – 91/271/EEC</p> <p>FOR THE DESIGNATION OF SENSITIVE ZONES</p>	P	P	P
<p>Drinking Water Protected Areas</p>	F	F	F

DIRECTIVE OR DECISION	ST	QE	FR
<p>DANGEROUS SUBSTANCES -76/464/EEC</p> <p>In 1980 the protection of groundwater was taken out of 76/464/EEC (pollution by certain dangerous substances) and regulated under the Directive 89/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances (disposal of waste substances)</p>	F	F	F
<p>NITRATES – 91/676/EEC</p>	P	F	P
<p>URBAN WASTE WATER TREATMENT – 91/271/EEC</p> <p>FOR THE DESIGNATION OF SENSITIVE ZONES</p>	P	P	P
<p>No additional specific monitoring criteria for GWBs by WFD for Drinking Water Protected Areas. However, Level, Surveillance and Operational networks are to be supplemented by monitoring programmes required for</p>	F	F	F

ADJUSTMENT OF SITES IN GROUNDWATER MONITORING

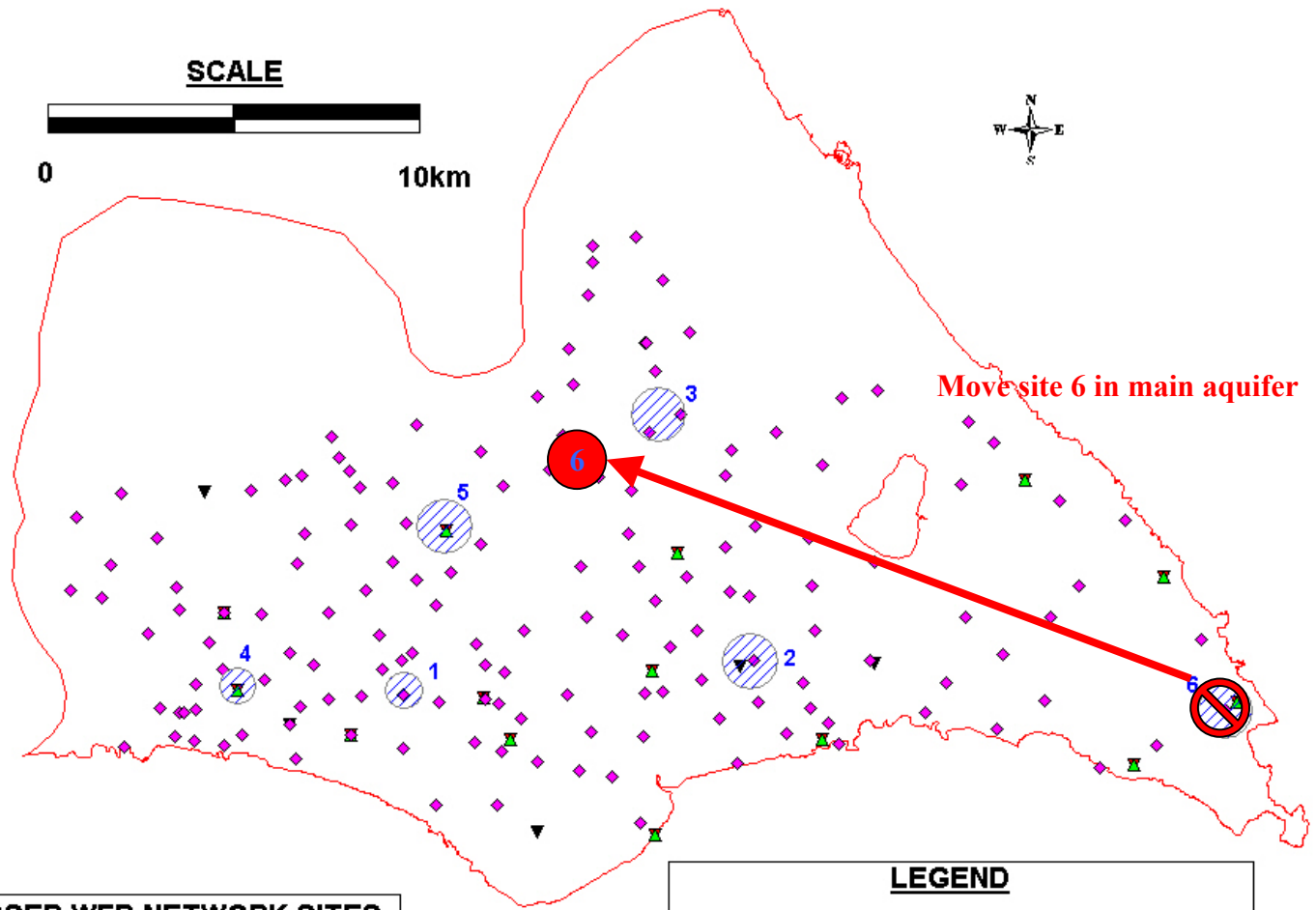
After a series of meetings with the WDD and the GSD, at the presence of PM Team Representative the following most important issues were raised with regards to the GWT monitoring options:

- Preferably and where possible, existing boreholes should be used
- For the case of qualitative monitoring, existing boreholes being pumped on a steady basis (i.e. Government, domestic supply / irrigation) should be selected.
- For the case of quantitative, separate non pumping boreholes, near the ones of the qualitative monitoring but out of their interference area (i.e. GSD Boreholes with automatic recording) should be preferred.
- Where selection of existing boreholes is not possible, install new pumps on government boreholes – use of a portable generator
- Where government boreholes cannot be utilized, drill new boreholes

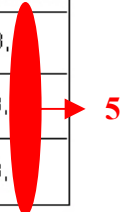
Changes per GWB follow next:

GROUNDWATER BODY CY_1: KOKKINOCHORIA (AT RISK)

EXISTING MONITORING PROGRAMS & OUTLINE OF WFD MONITORING NETWORK OPTIONS



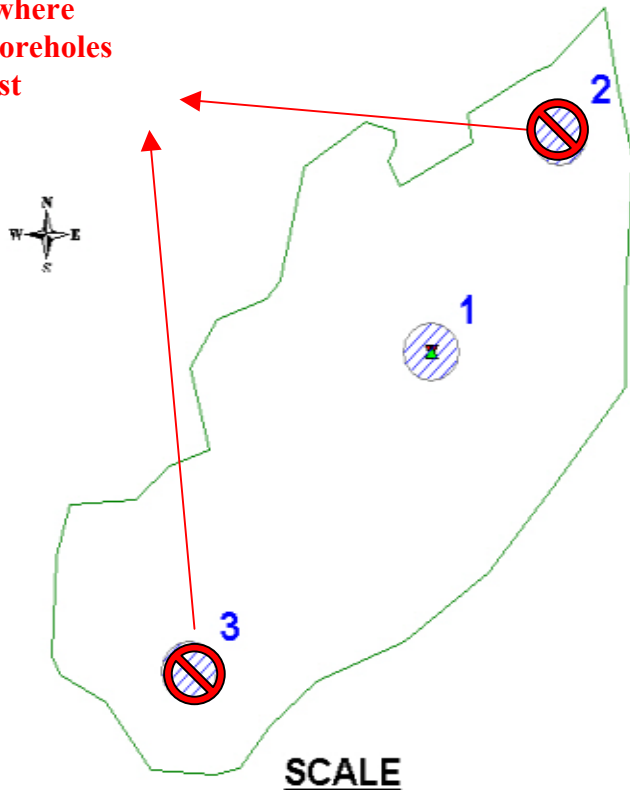
PROPOSED WFD NETWORK SITES		
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4, 5, 6	1, 2, 3,
SURVEILLANCE	1, 2, 3, 4, 5, 6	1, 2, 3,
OPERATIONAL	1, 2, 3, 4, 5, 6	1, 2, 3,



LEGEND	
◆	Water Level and Quality of Groundwater - WDD
◆	Water Flow and Quality of Springs - WDD
▼	Water Level and Quality of Groundwater - GSD
▲	National Quality Monitoring Network - GSD
▼	Directive 91/676/EEC - Nitrates Pollution - GSD
◉	Proposed WFD Monitoring Network Sites

GROUNDWATER BODY CY_2: ARADIPPOU GYPSUM EXISTING MONITORING PROGRAMS & OUTLINE OF WFD MONITORING NETWORK OPTIONS

Move where
existing boreholes
exist



LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

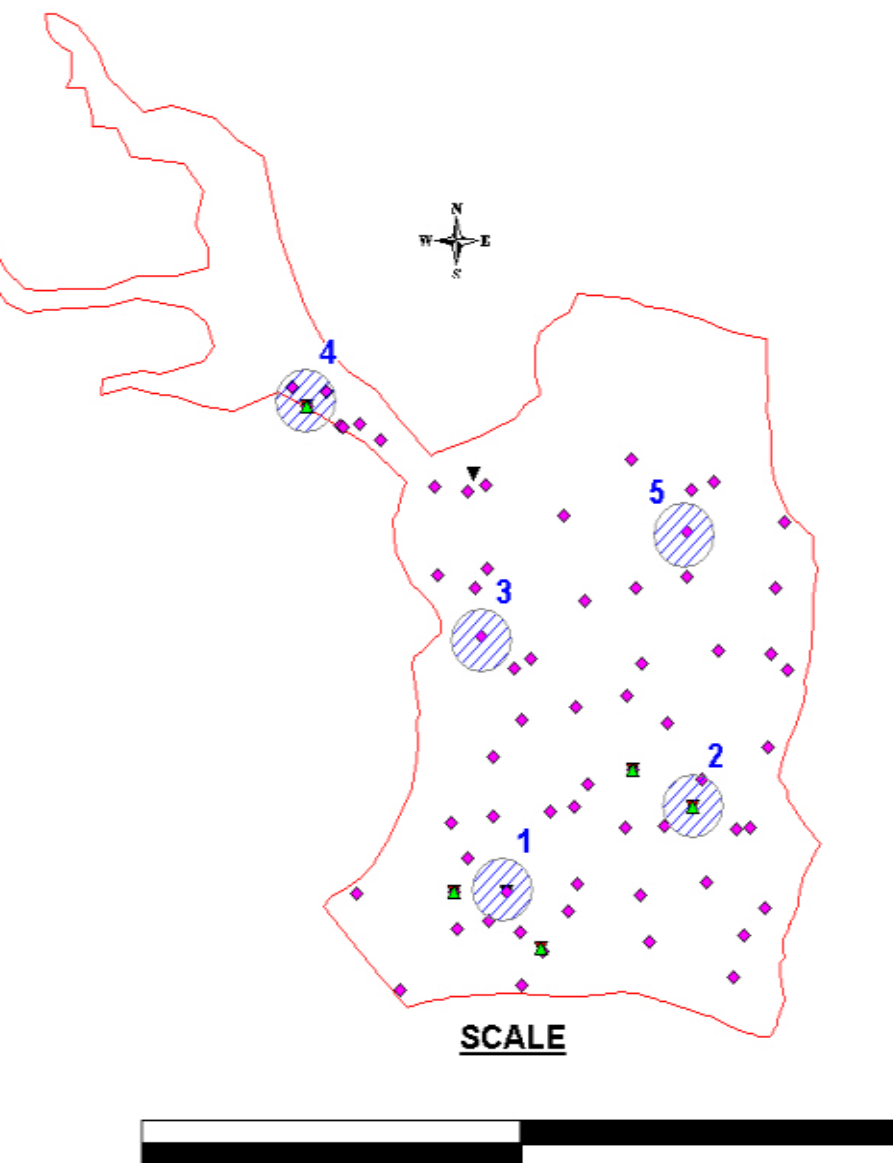
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3	1, 2, 3
SURVEILLANCE	1, 2, 3	1, 2, 3
OPERATIONAL	N/A	N/A

0

10km

KITI - PERVOLIA AND TREMITHIOS RIVERBED (AT RISK)

EXISTING MONITORING PROGRAMS & OUTLINE OF WFD MONITORING NETWORK OPTIONS

LEGEND

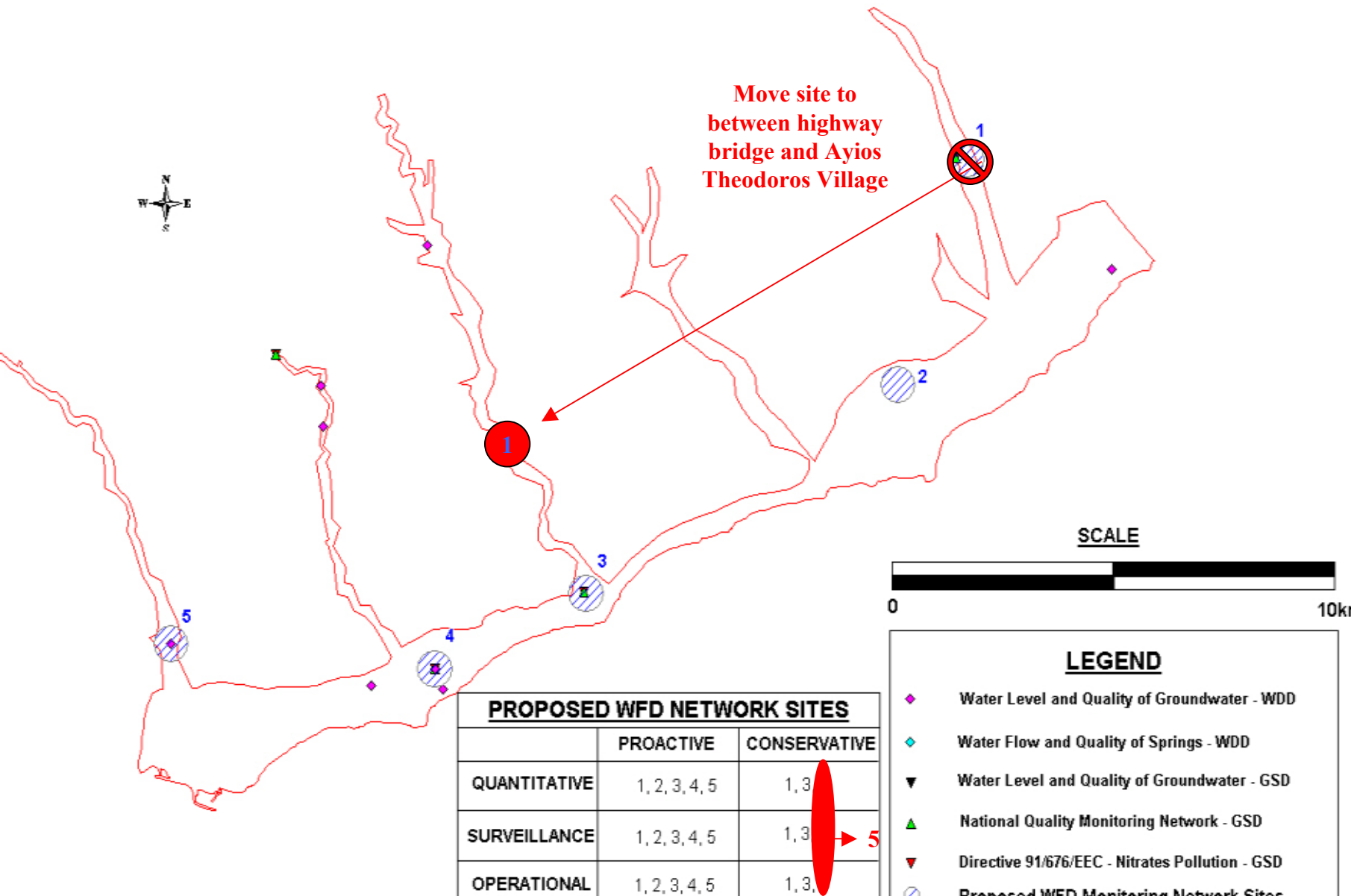
- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4, 5	1, 4
SURVEILLANCE	1, 2, 3, 4, 5	1, 4 3 ←
OPERATIONAL	1, 2, 3, 4, 5	1, 4

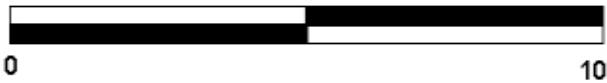
SOFTADES - ZYGI - COASTAL PLAIN AND RIVERBED (AT RISK)

EXISTING MONITORING PROGRAMS & OUTLINE OF WFD MONITORING NETWORK OPTIONS



Move site to
between highway
bridge and Ayios
Theodoros Village

SCALE



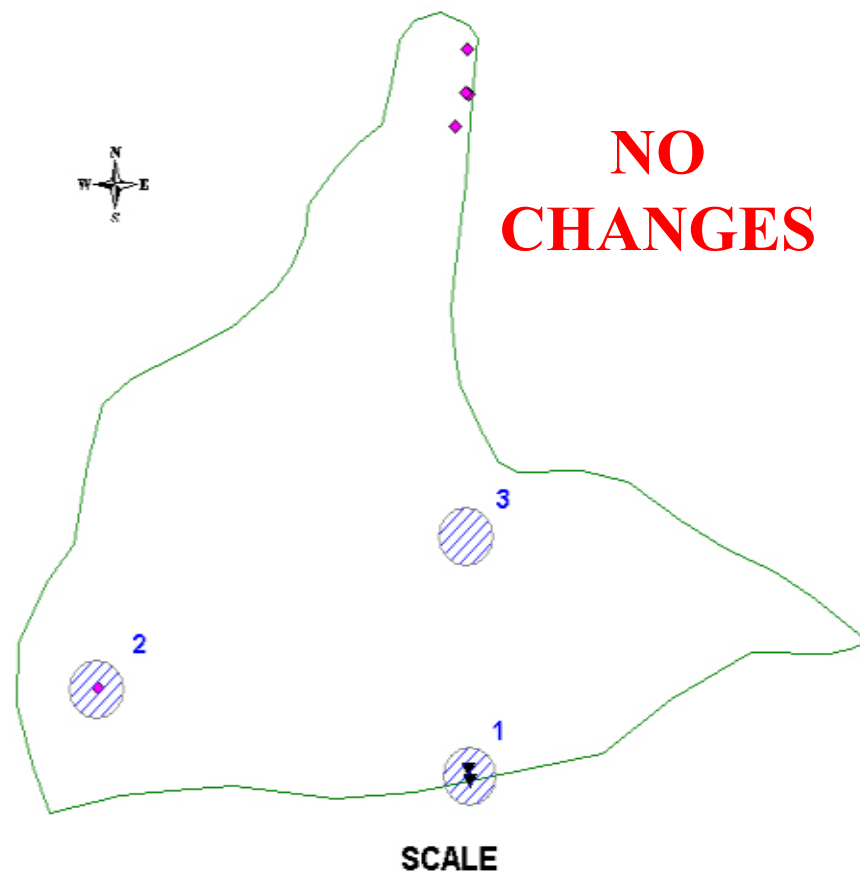
LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4, 5	1, 3
SURVEILLANCE	1, 2, 3, 4, 5	1, 3, 5
OPERATIONAL	1, 2, 3, 4, 5	1, 3,

**GROUNDWATER BODY CY_5:
MARONI GYPSUM
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊗ Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

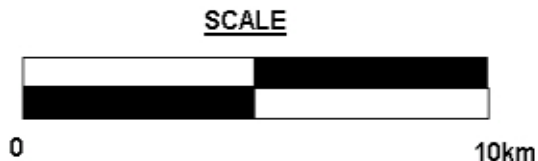
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3	1, 2, 3
SURVEILLANCE	1, 2, 3	1, 2, 3
OPERATIONAL	N/A	N/A



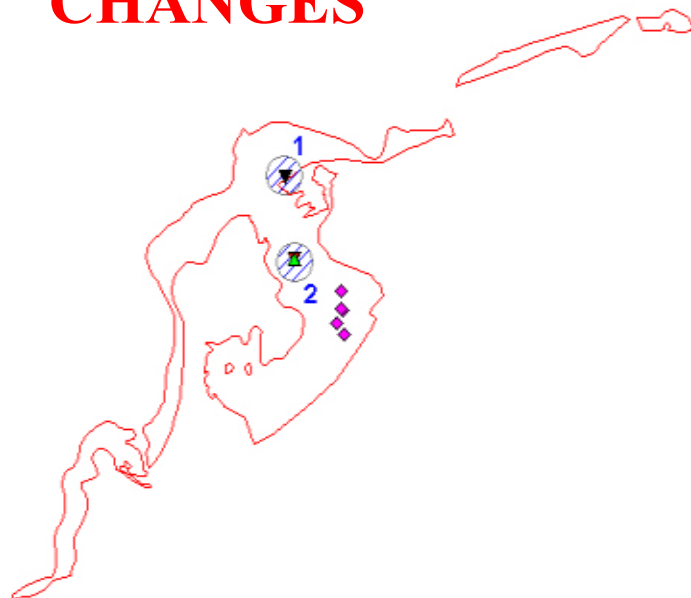
0

10km

GROUNDWATER BODY CY_6:
 MARI-KALO CHORIO CHALKS AND CHOIROKOITIA SANDSTONES (AT RISK)
 EXISTING MONITORING PROGRAMS & OUTLINE OF WFD MONITORING NETWORK OPTIONS

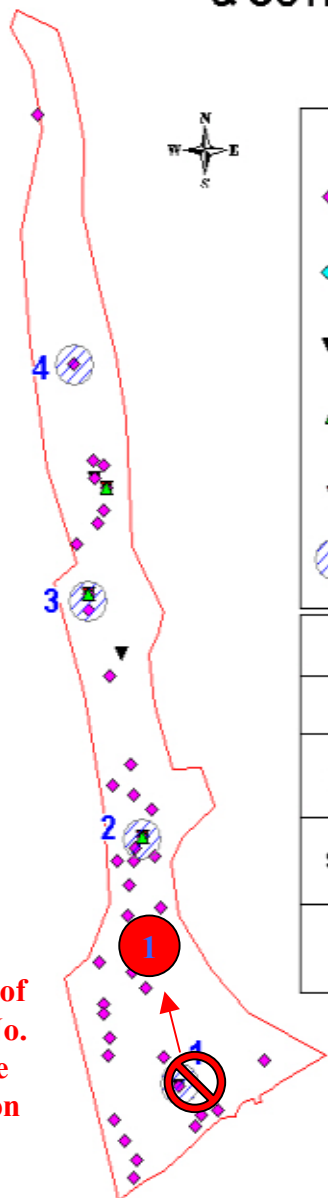


**NO
 CHANGES**



LEGEND		
◆	Water Level and Quality of Groundwater - WDD	
◆	Water Flow and Quality of Springs - WDD	
▼	Water Level and Quality of Groundwater - GSD	
▲	National Quality Monitoring Network - GSD	
▼	Directive 91/676/EEC - Nitrates Pollution - GSD	
⊖	Proposed WFD Monitoring Network Sites	
PROPOSED WFD NETWORK SITES		
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3	1, 2, 3
SURVEILLANCE	1, 2, 3	1, 2, 3
OPERATIONAL	1, 2, 3	1, 2, 3

**GROUNDWATER BODY CY_7:
GERMASOGEIA RIVERBED (AT RISK)
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊘ Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

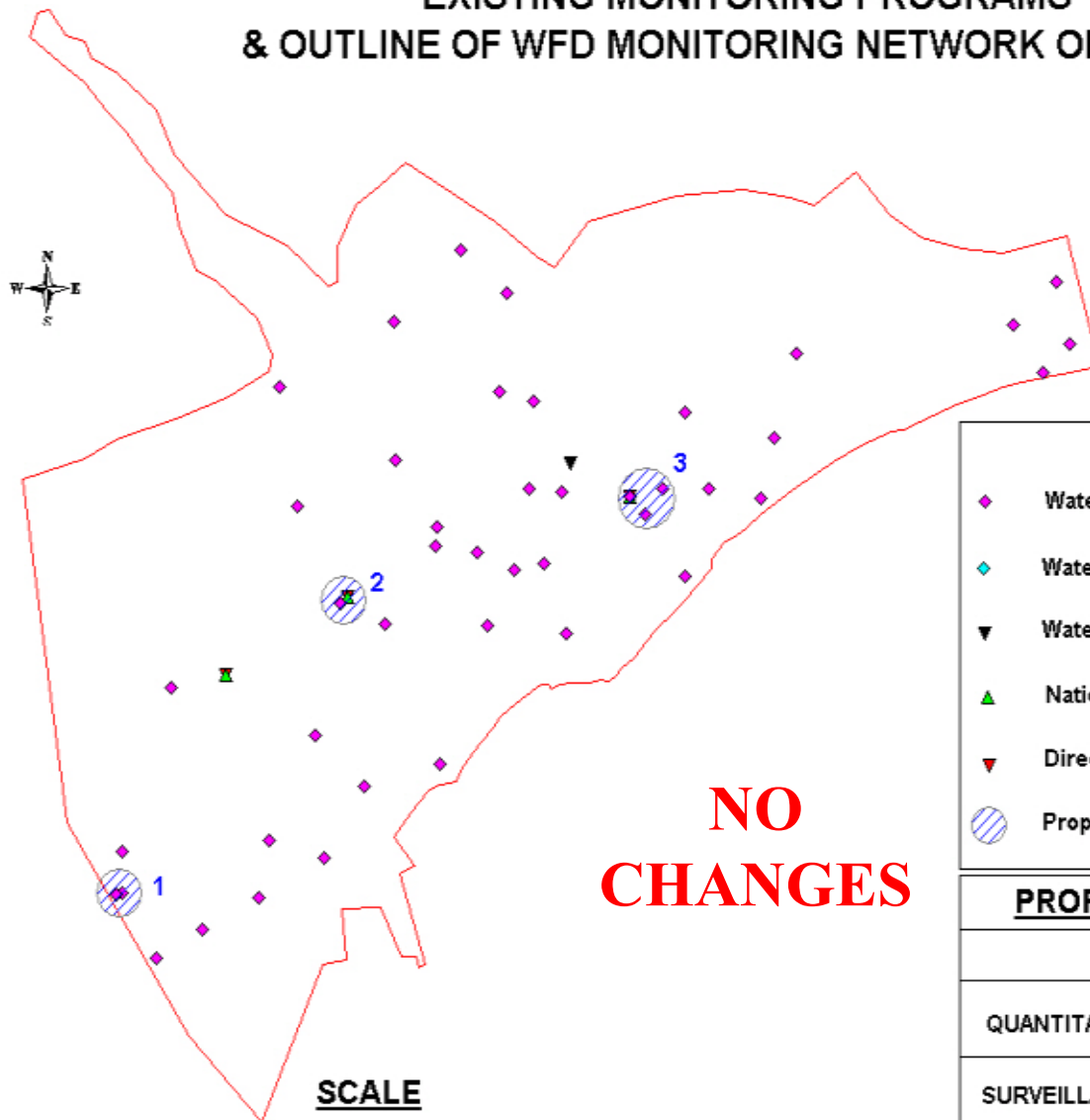
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4	1, 3, 4
SURVEILLANCE	1, 2, 3, 4	1, 3, 4
OPERATIONAL	1, 2, 3, 4	1, 3, 4

Move site to beginning of Delta (possibly Hydr. No. 861?) to avoid possible permanent sea intrusion

SCALE



**GROUNDWATER BODY CY_8:
LEMESOS (AT RISK)
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



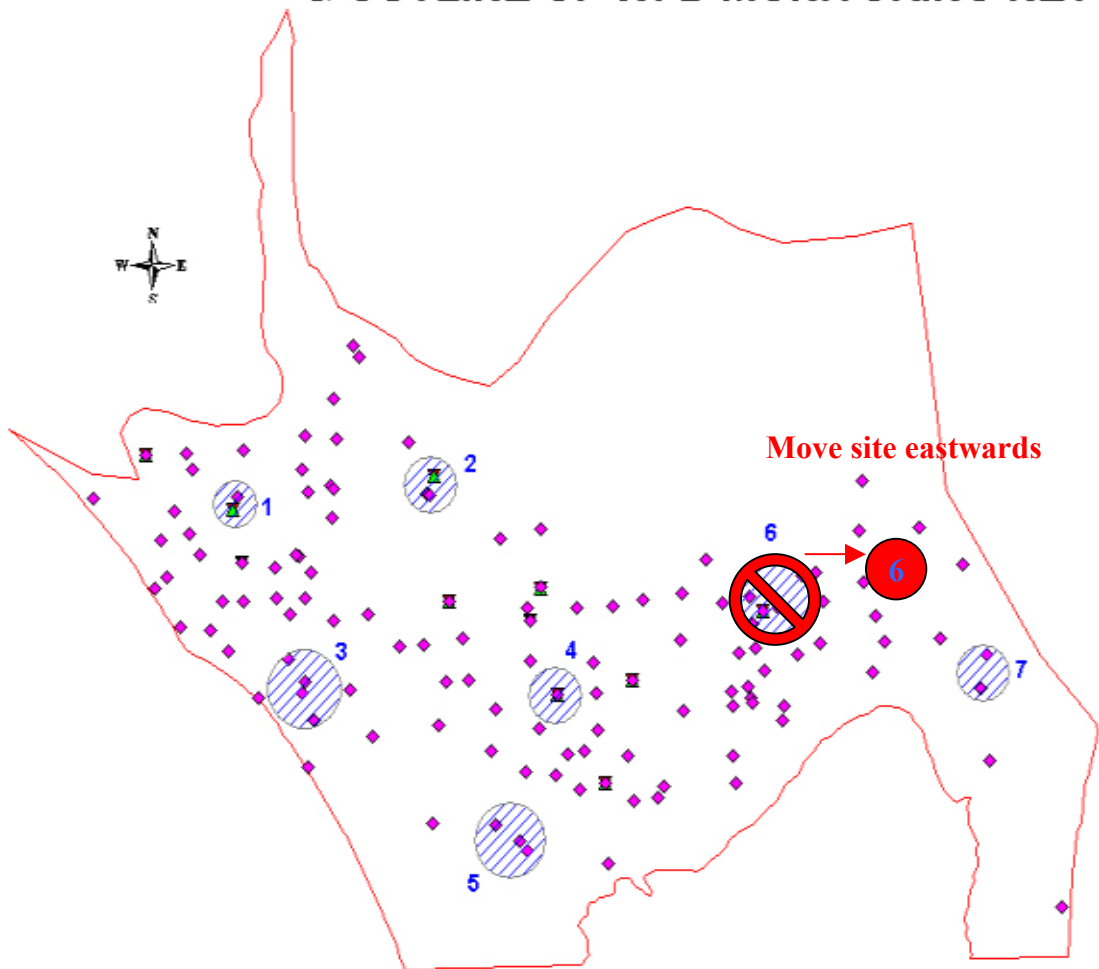
LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ◉ Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3	1, 2, 3
SURVEILLANCE	1, 2, 3	1, 2, 3
OPERATIONAL	1, 2, 3	1, 2, 3

GROUNDWATER BODY CY_9: AKROTIRI (AT RISK) EXISTING MONITORING PROGRAMS & OUTLINE OF WFD MONITORING NETWORK OPTIONS



LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊘ Proposed WFD Monitoring Network Sites

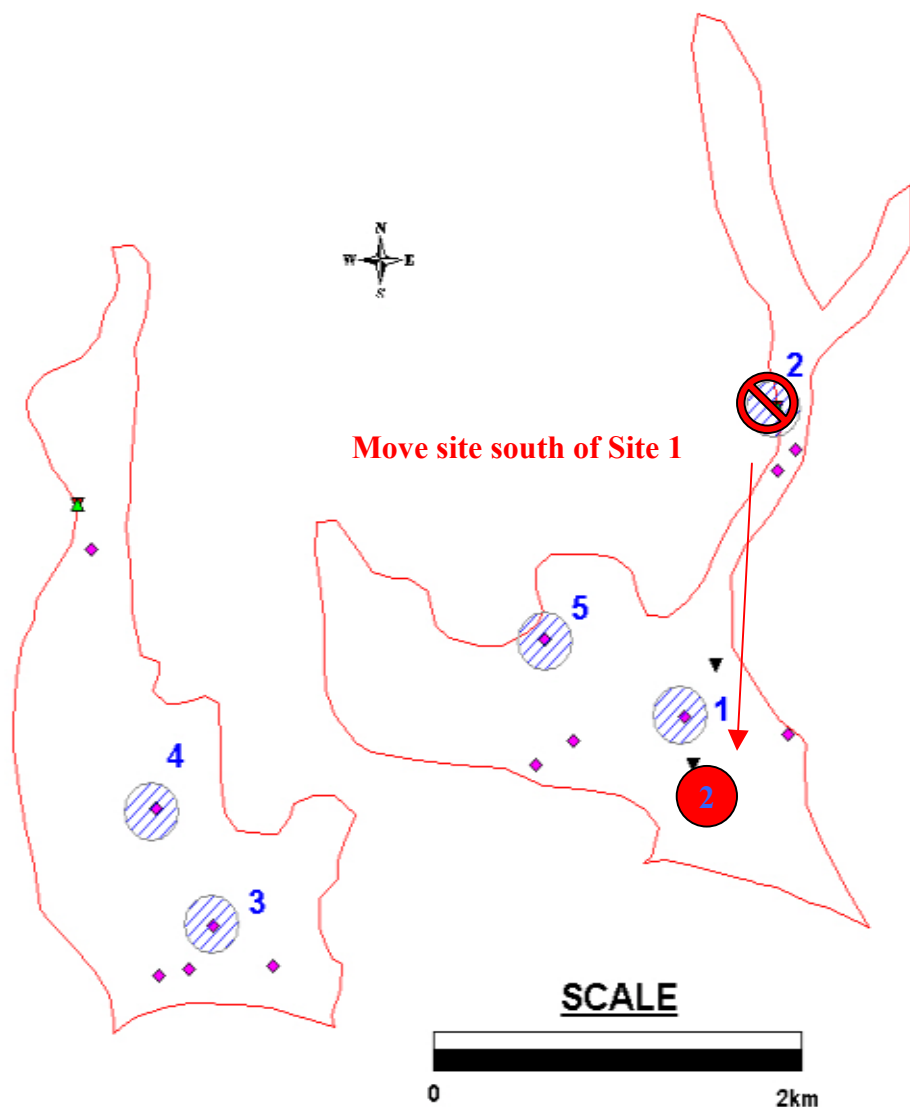
PROPOSED WFD NETWORK SITES

	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6
SURVEILLANCE	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6
OPERATIONAL	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6

SCALE



**GROUNDWATER BODY CY_10:
PARAMALI AND AVDIMOU (AT RISK)
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



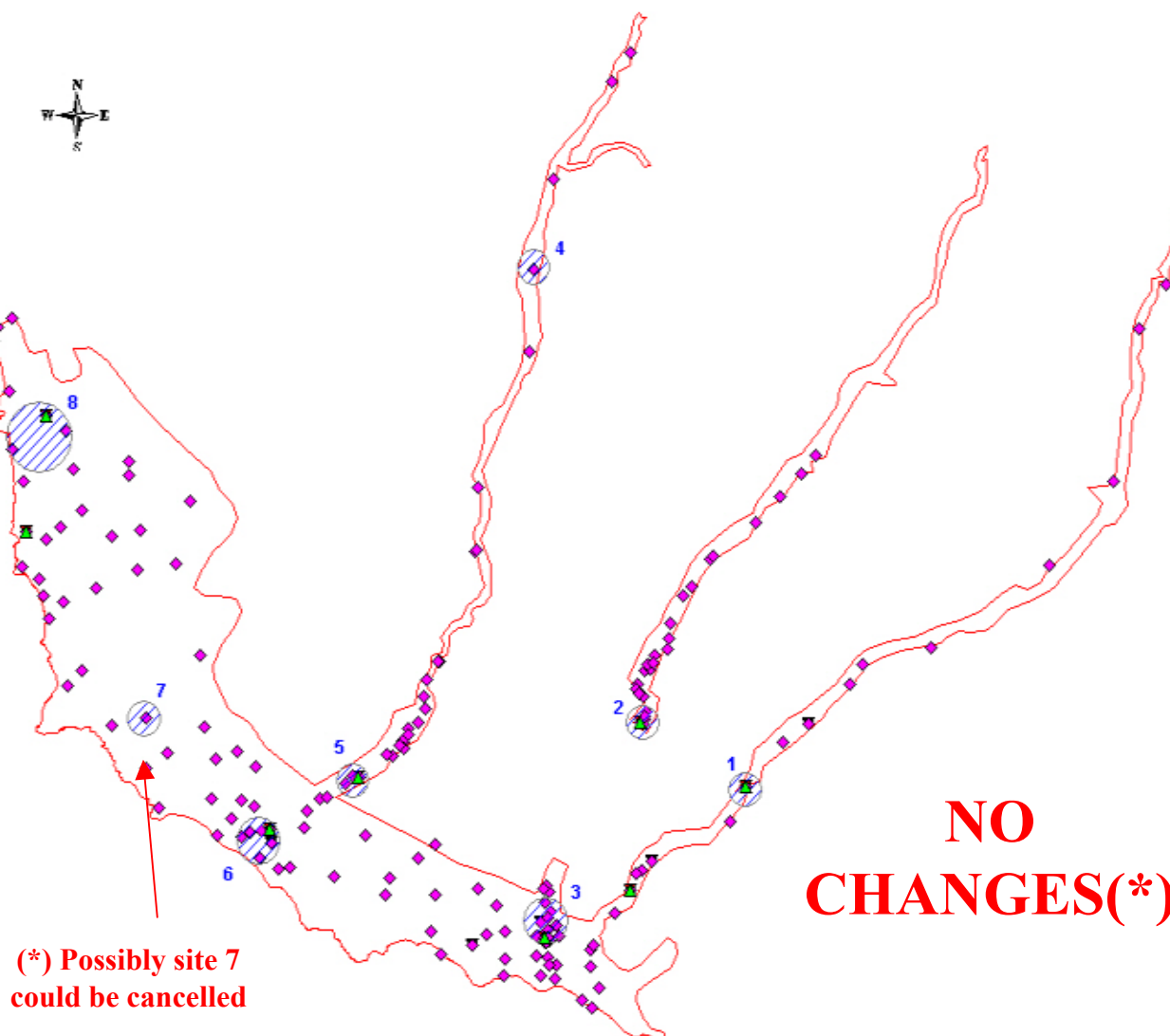
LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊘ Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4, 5	1, 2, 3
SURVEILLANCE	1, 2, 3, 4, 5	1, 2, 3
OPERATIONAL	1, 2, 3, 4, 5	1, 2, 3

**GROUNDWATER BODY CY_11:
PAFOS COASTAL PLAIN AND RIVERBEDS (AT RISK)
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



SCALE



0 10km

LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊘ Proposed WFD Monitoring Network Sites

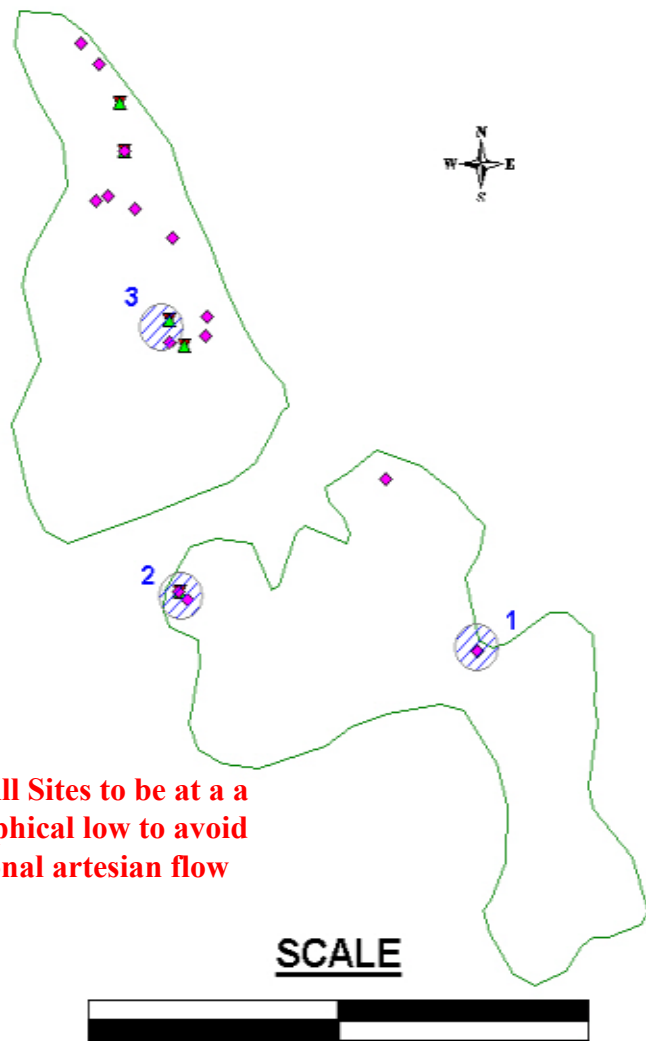
PROPOSED WFD NETWORK SITES

	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 5, 6,
SURVEILLANCE	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 5, 6,
OPERATIONAL	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 5, 6,

**NO
CHANGES(*)**

(*) Possibly site 7 could be cancelled

**GROUNDWATER BODY CY_12:
LETYMOVU - GIOLOU GYPSUM
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



Check All Sites to be at a topographical low to avoid occasional artesian flow

<u>LEGEND</u>	
◆	Water Level and Quality of Groundwater - WDD
◇	Water Flow and Quality of Springs - WDD
▼	Water Level and Quality of Groundwater - GSD
▲	National Quality Monitoring Network - GSD
▼	Directive 91/676/EEC - Nitrates Pollution - GSD
⊘	Proposed WFD Monitoring Network Sites

<u>PROPOSED WFD NETWORK SITES</u>		
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3	1, 2, 3
SURVEILLANCE	1, 2, 3	1, 2, 3
OPERATIONAL	N/A	N/A

0

10km

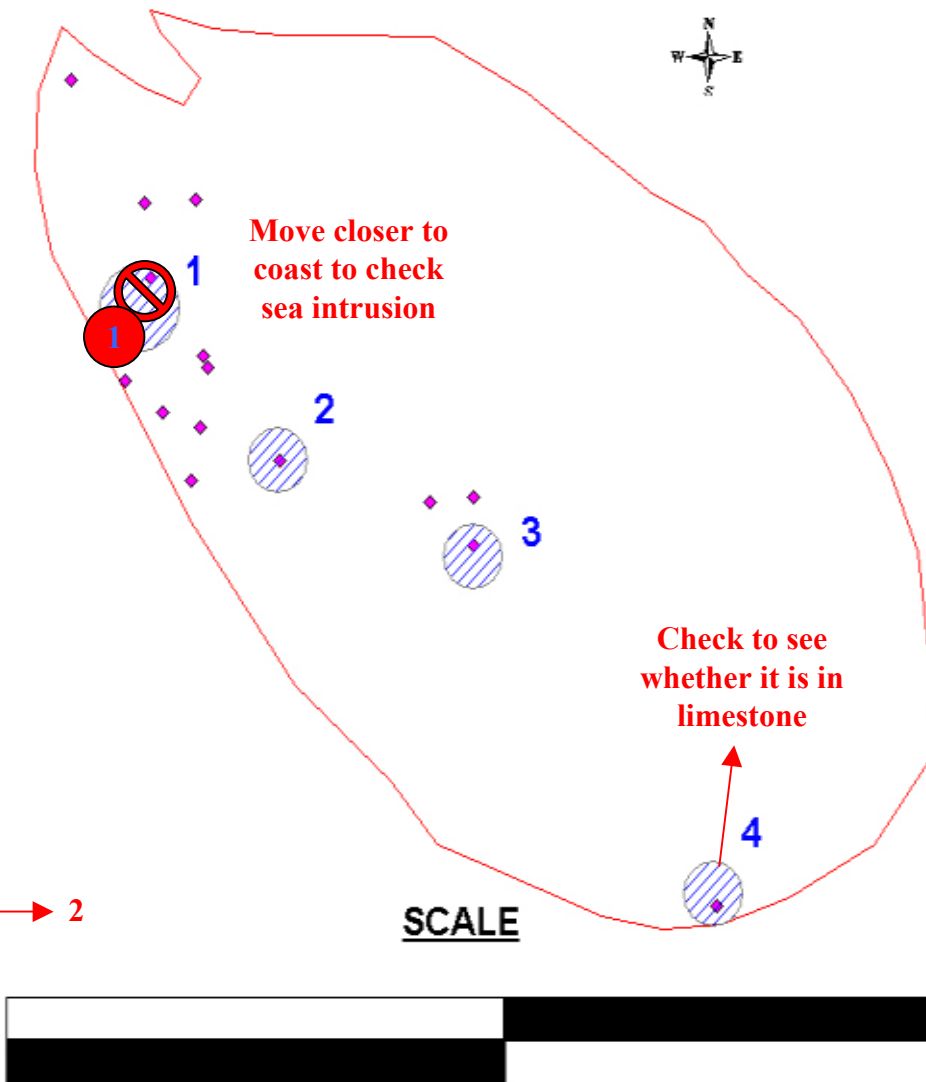
**GROUNDWATER BODY CT_13:
PEGEIA LIMESTONE (AT RISK)
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**

LEGEND

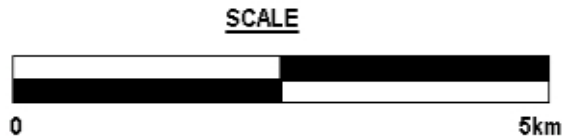
- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊘ Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4	1, 3,
SURVEILLANCE	1, 2, 3, 4	1, 3,
OPERATIONAL	1, 2, 3, 4	1, 3,



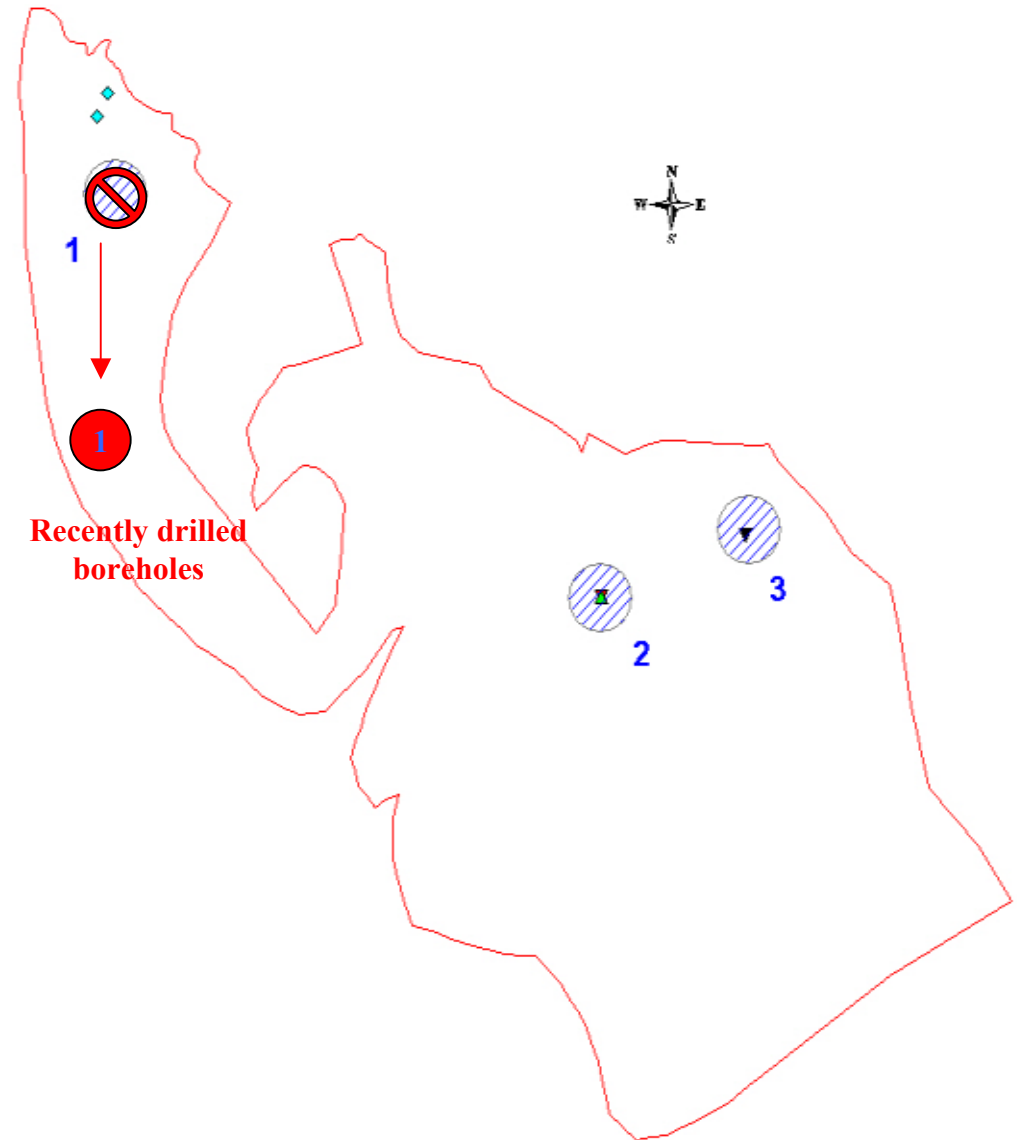
**GROUNDWATER BODY CY_14:
ANDROLIKOU LIMESTONES (AT RISK)
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



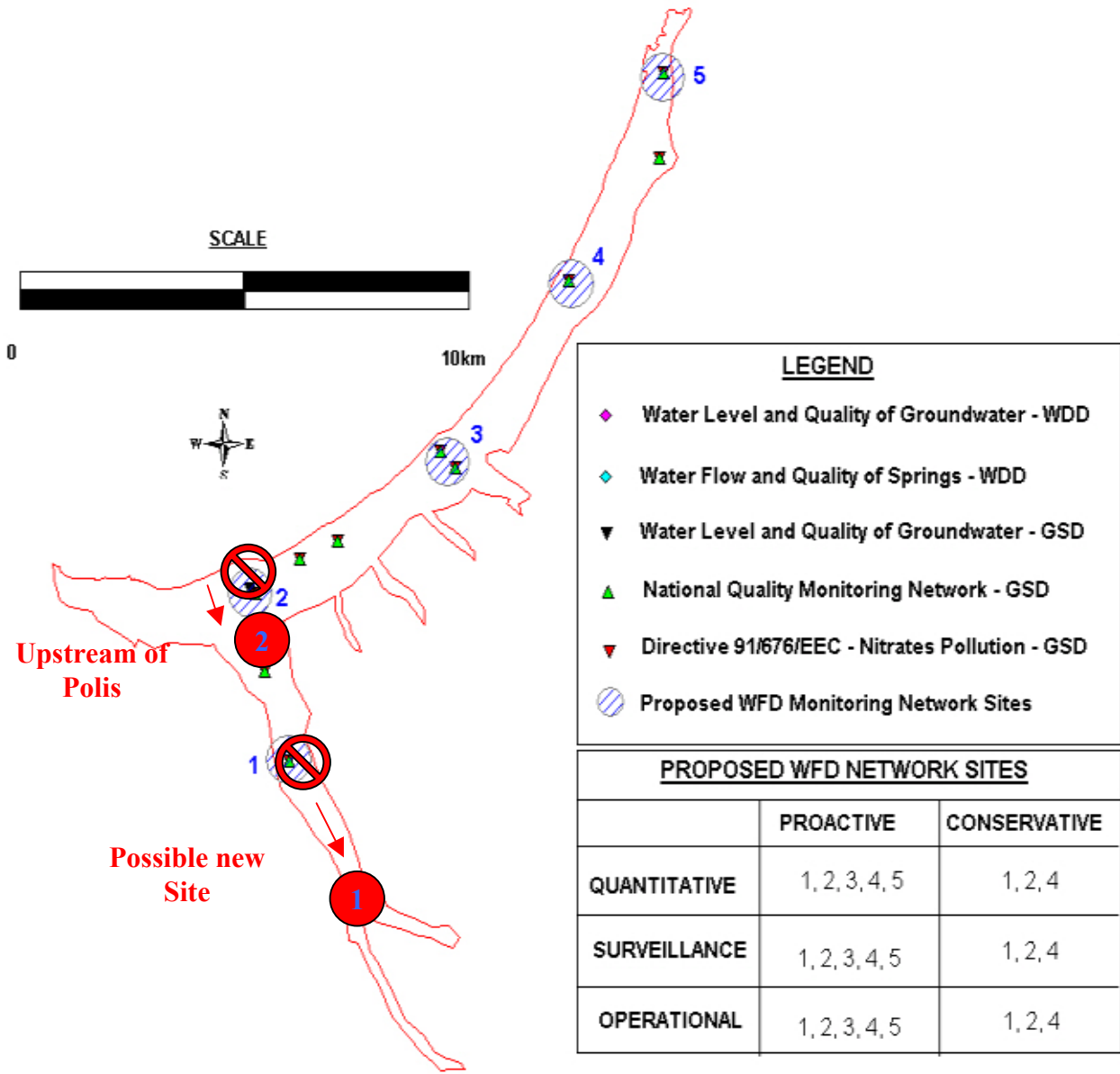
LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊘ Proposed WFD Monitoring Network Sites

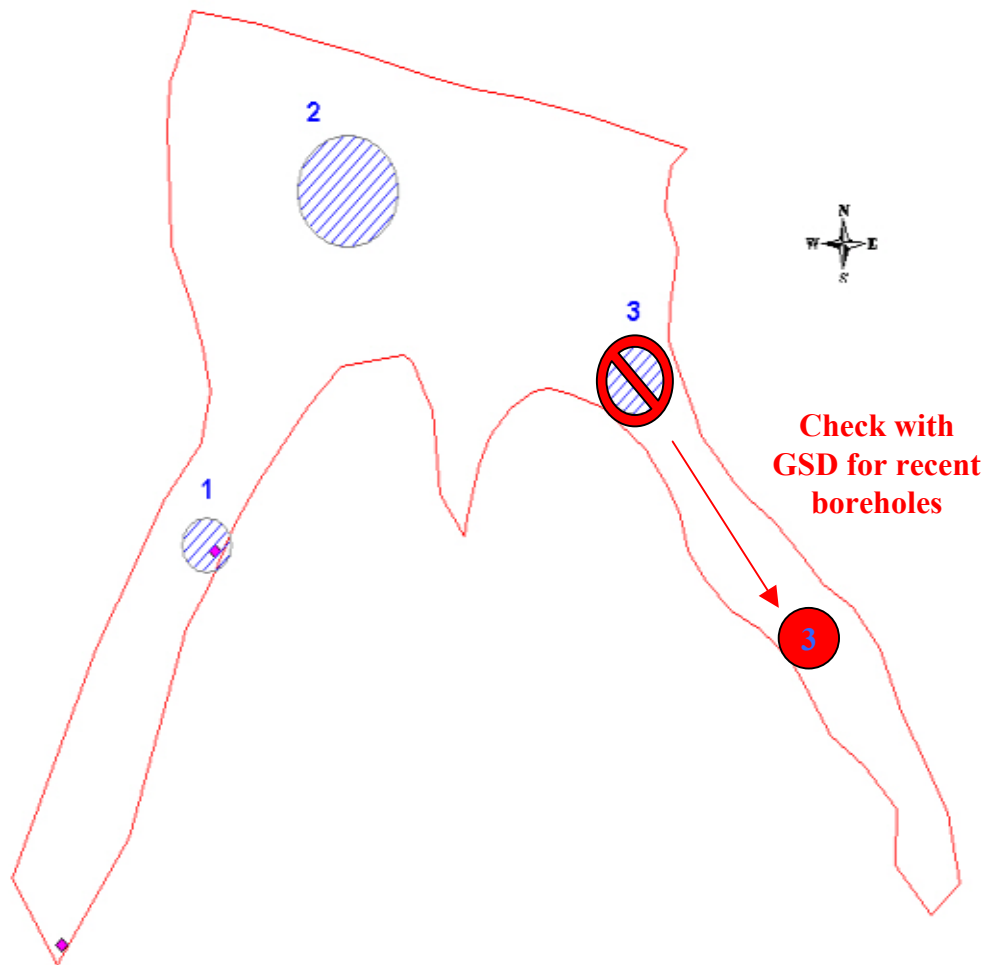
PROPOSED WFD NETWORK SITES		
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3	1, 2, 3
SURVEILLANCE	1, 2, 3	1, 2, 3
OPERATIONAL	1, 2, 3	1, 2, 3



**GROUNDWATER BODY CY_15:
CHRYSOCHOU - GIALIA COASTAL PLAIN AND RIVERBEDS (AT RISK)
EXISTING MONITORING PROGRAMS & OUTLINE OF WFD MONITORING NETWORK OPTIONS**



**GROUNDWATER BODY CY_16:
PYRGOS (AT RISK)
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊘ Proposed WFD Monitoring Network Sites

PROPOSED WFD NETWORK SITES

	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3	1, 2, 3
SURVEILLANCE	1, 2, 3	1, 2, 3
OPERATIONAL	1, 2, 3	1, 2, 3

SCALE



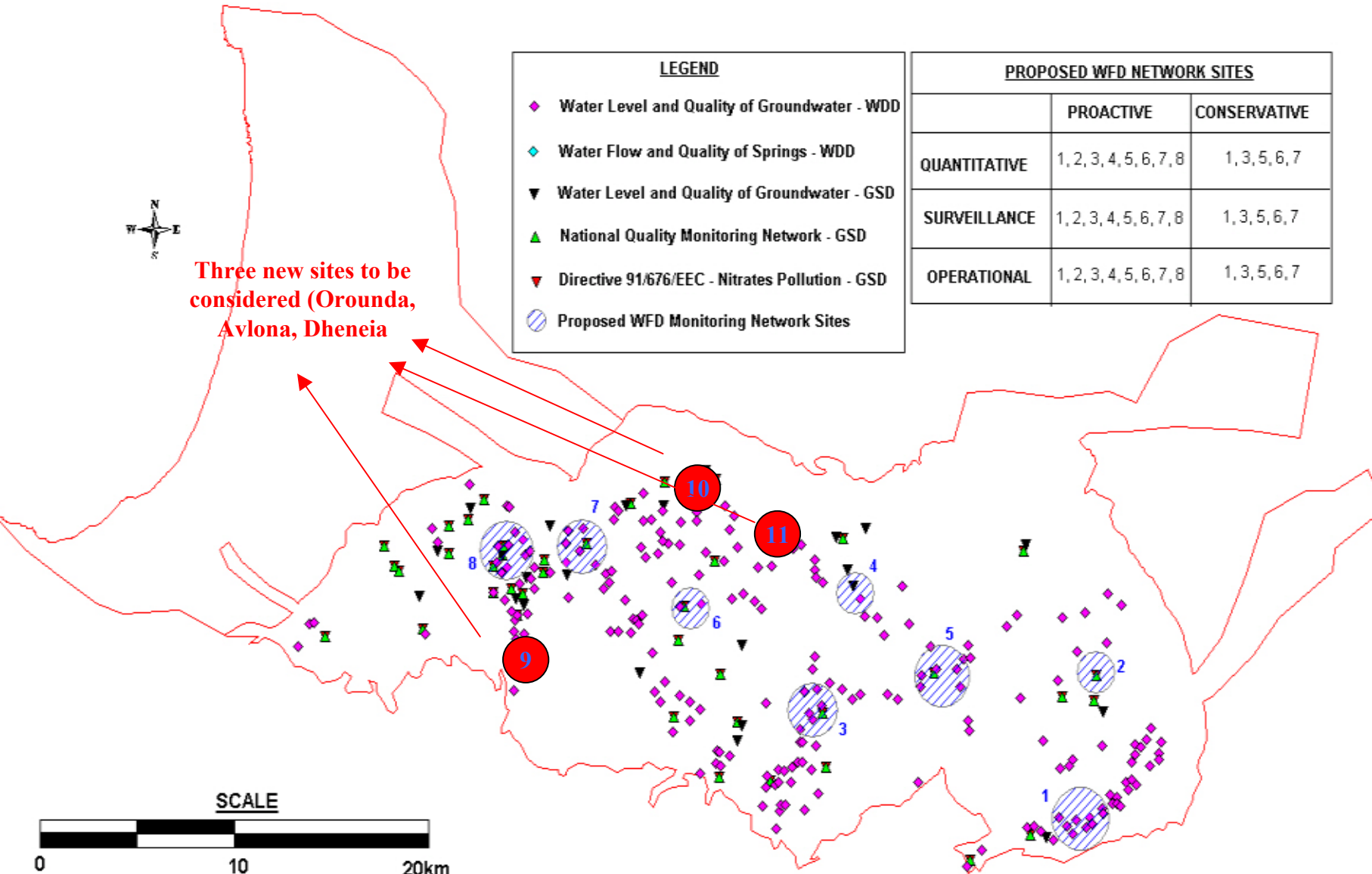
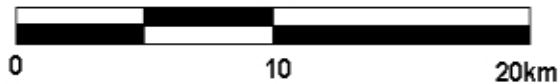
**GROUNDWATER BODY CY_17:
CENTRAL AND EASTERN MESAORIA (AT RISK)
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**



Three new sites to be considered (Orounda, Avlona, Dheneia)







LEGEND	
◆	Water Level and Quality of Groundwater - WDD
◊	Water Flow and Quality of Springs - WDD
▼	Water Level and Quality of Groundwater - GSD
▲	National Quality Monitoring Network - GSD
▼	Directive 91/676/EEC - Nitrates Pollution - GSD
⊘	Proposed WFD Monitoring Network Sites

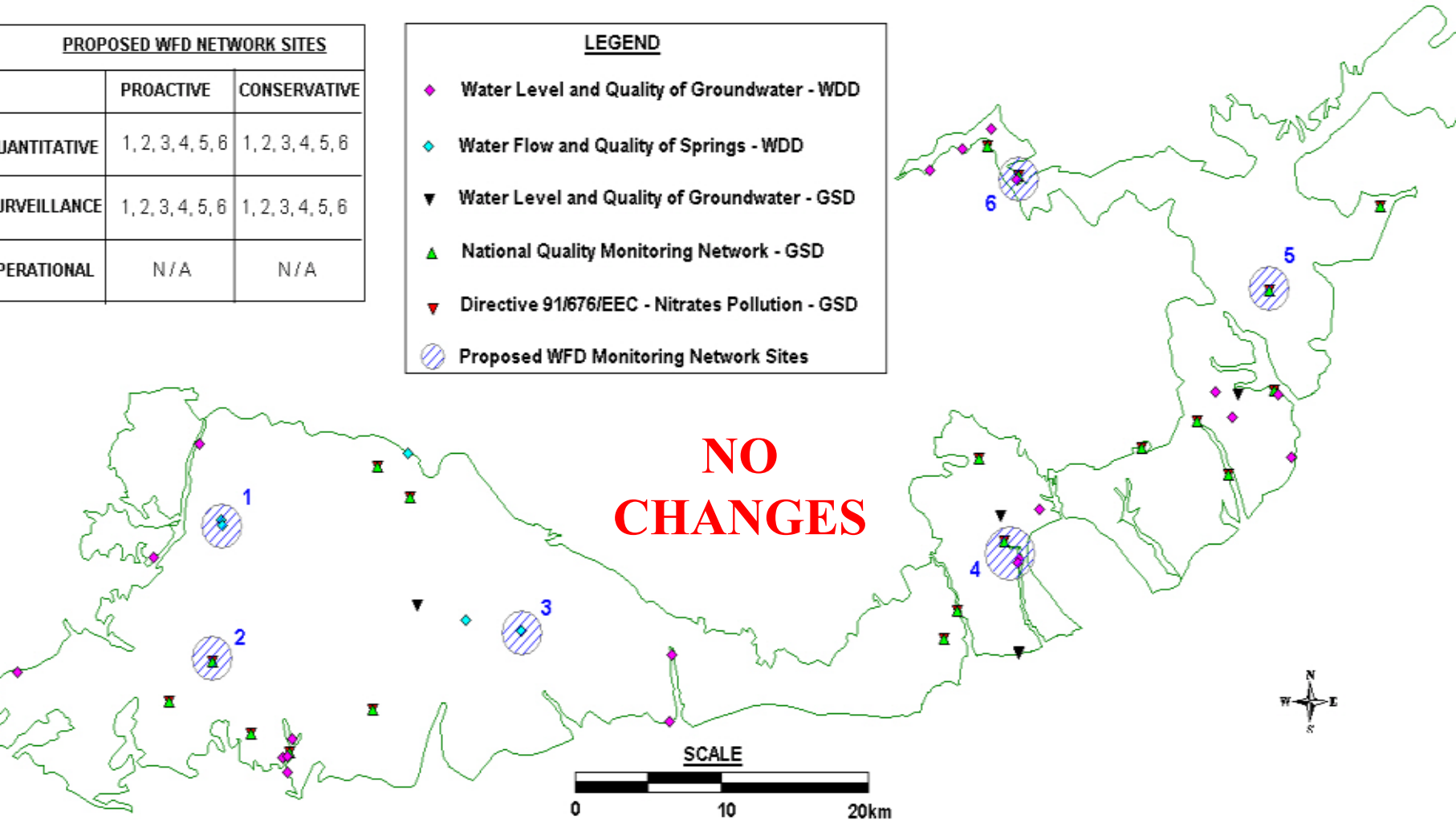
PROPOSED WFD NETWORK SITES		
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4, 5, 6, 7, 8	1, 3, 5, 6, 7
SURVEILLANCE	1, 2, 3, 4, 5, 6, 7, 8	1, 3, 5, 6, 7
OPERATIONAL	1, 2, 3, 4, 5, 6, 7, 8	1, 3, 5, 6, 7



**GROUNDWATER BODY CY_18:
LEFKARA-PACHNA FORMATIONS
EXISTING MONITORING PROGRAMS
& OUTLINE OF WFD MONITORING NETWORK OPTIONS**

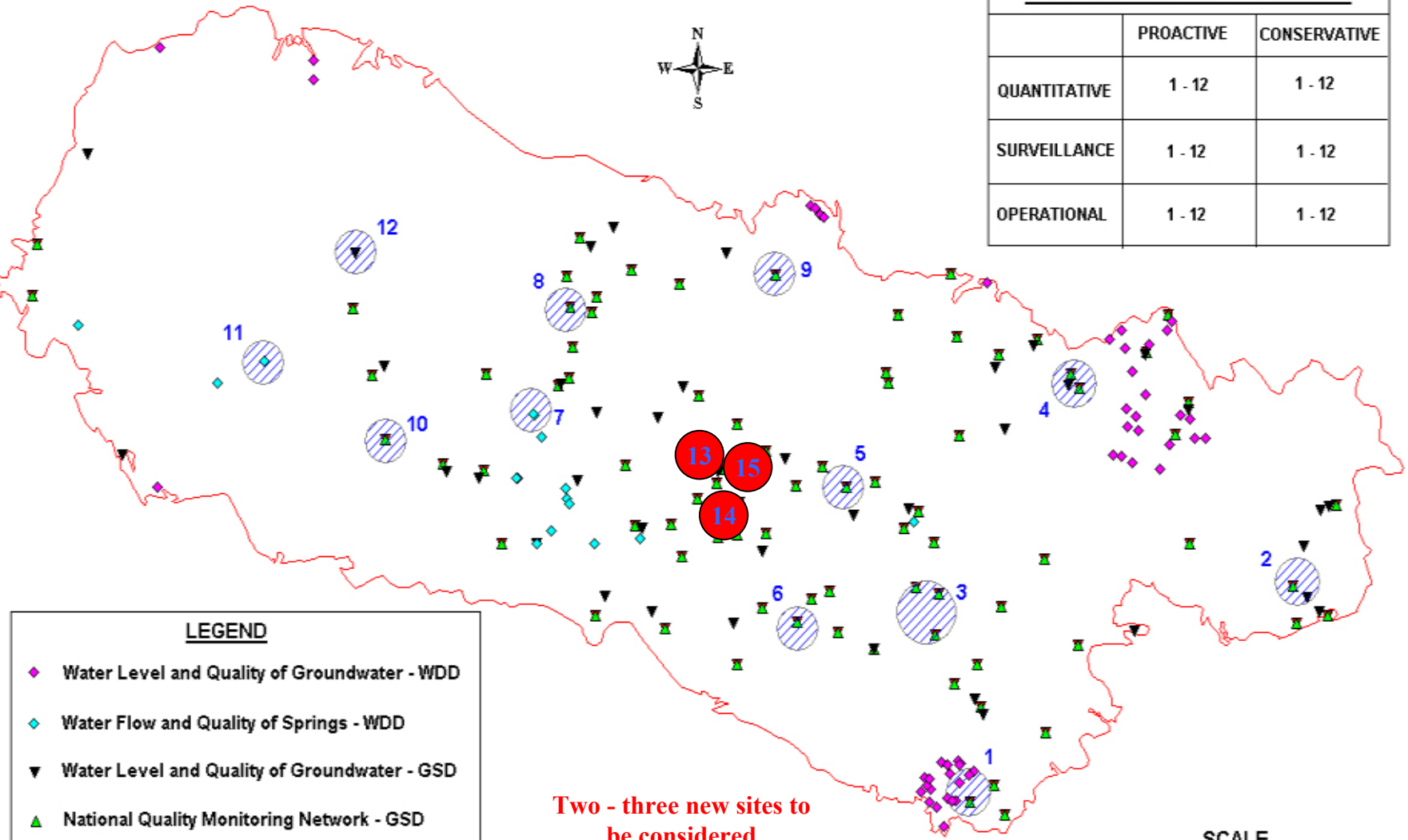
PROPOSED WFD NETWORK SITES		
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6
SURVEILLANCE	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6
OPERATIONAL	N/A	N/A

LEGEND	
	Water Level and Quality of Groundwater - WDD
	Water Flow and Quality of Springs - WDD
	Water Level and Quality of Groundwater - GSD
	National Quality Monitoring Network - GSD
	Directive 91/676/EEC - Nitrates Pollution - GSD
	Proposed WFD Monitoring Network Sites



**GROUNDWATER BODY CY_19:
TROODOS AREA (TROODOS IGNEOUS MASSIF AQUIFERS) (AT RISK)
EXISTING MONITORING PROGRAMS & OUTLINE OF WFD MONITORING NETWORK OPTIONS**

<u>PROPOSED WFD NETWORK SITES</u>		
	PROACTIVE	CONSERVATIVE
QUANTITATIVE	1 - 12	1 - 12
SURVEILLANCE	1 - 12	1 - 12
OPERATIONAL	1 - 12	1 - 12



LEGEND

- ◆ Water Level and Quality of Groundwater - WDD
- ◆ Water Flow and Quality of Springs - WDD
- ▼ Water Level and Quality of Groundwater - GSD
- ▲ National Quality Monitoring Network - GSD
- ▼ Directive 91/676/EEC - Nitrates Pollution - GSD
- ⊘ Proposed WFD Monitoring Network Sites

**Two - three new sites to
be considered
(Amiantos, Kyperounda,
Chandria – Agros)**

SCALE



SOME FINAL REMARKS

Samples obtained under the WFD monitoring programs and coinciding both in location and timing with any other requirement of any other Directive then these samples should serve the other Directives as well.

The WFD requires the establishment of monitoring programmes covering groundwater quantitative status, chemical status and the assessment of significant, long-term pollutant trends resulting from human activity.

These programmes do not and should not be thought as replacing any other National Water Resources Monitoring Programmes. The WFD monitoring programmes are indicative of trends and serve to evaluate the status of groundwater bodies. Day to day management plans and water resource assessment that would enable their sustained use require specialized monitoring programmes far denser and far more comprehensive. These should be designed and implemented on the basis of other National Objectives.