WORKING PAPER REV. ***0***[*]

DREDGED MATERIAL AND ENVIRONMENTAL REGULATIONS IN THE EU

1. Introduction

Dredged material is a unique, natural resource. The dredging activity takes place at the interface of the water bottom formed by sediment and the water body. This may lead to fairly unique problems with the regulation of dredging and dredged material disposal. The appropriate rules are also influenced by the specific environmental conditions and the history of dredging in a particular region. It should therefore not come as a surprise that the EU has not dealt specifically with dredged material regulations, nor does it currently intend to do so.
In view of the existence of international conventions for the protection of the marine environment on the one hand and the specific provisions for inland disposal in various Member States on the other hand, unlikely that specific European rules will be developed.

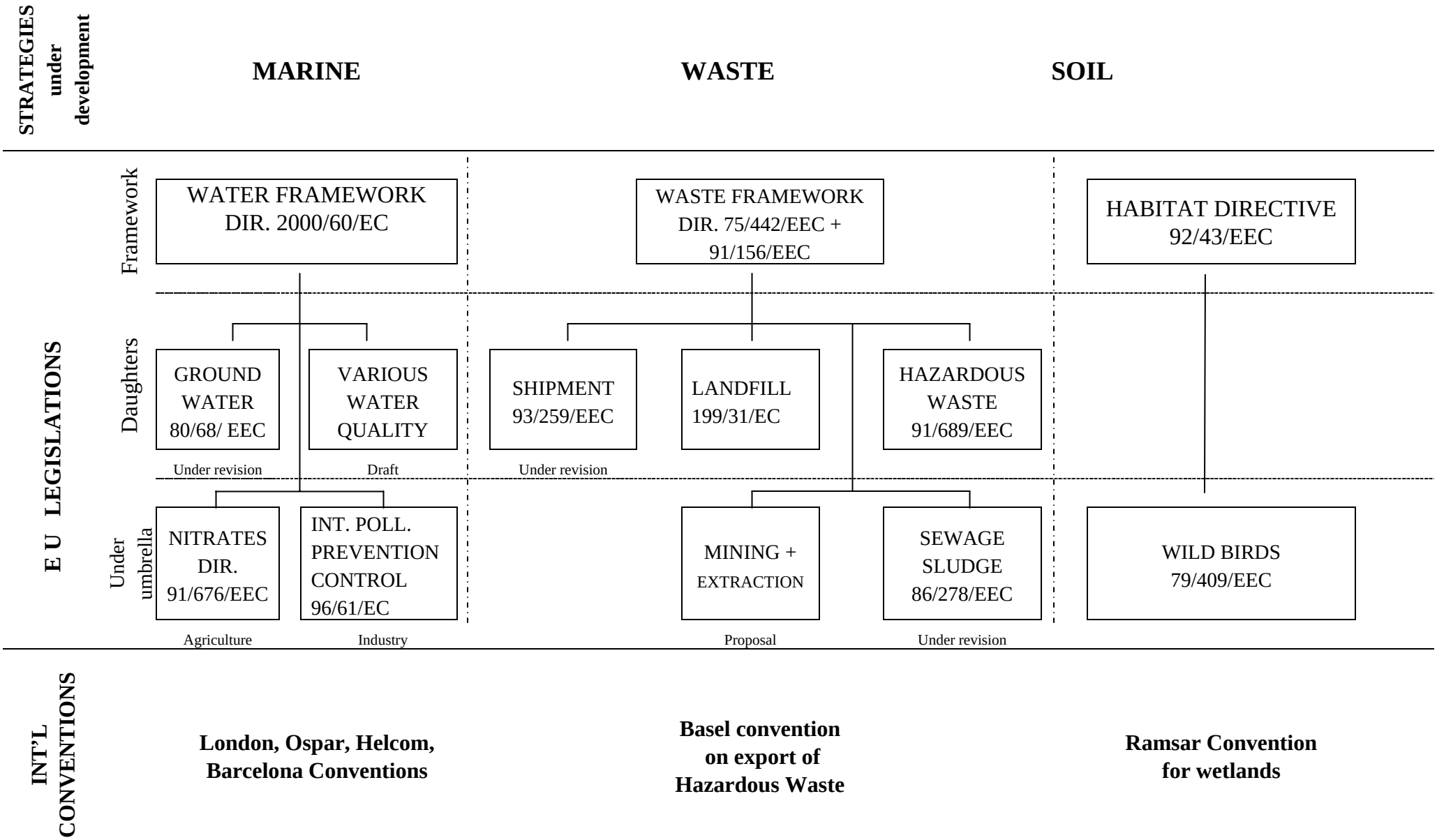
This does not mean that European rules and regulations are completely irrelevant: legislation on waste and sludge has some bearing on dredged material, while the Habitats Directive and Water Framework Directive may bring constraints to dredging projects. The purpose of this review paper is to clarify specific links between dredging, dredged material disposal and current EU legislation and to outline the more practical implications as viewed by the industry.

The discussion is organized around the Waste Framework Directive, the Water Framework Directive and will be complemented with a brief discussion of the link with the Habitats Directive.

Finally the role of International Conventions such as OSPAR is highlighted.
Diagram 1. presents a synthesis view of EU regulation touching upon dredging material and disposal.
The review does not cover environmental aspects of dredging operations and vessels (e.g. emissions, ballast water, vessel coatings etc.).

[*] This review paper will be regularly updated.

Diagram 1 :


STRATEGIES under development
MARINE
WASTE
SOIL
E U LEGISLATIONS
Framework
Daughters
Under umbrella
WATER FRAMEWORK DIR. 2000/60/EC
WASTE FRAMEWORK DIR. 75/442/EEC + 91/156/EEC
HABITAT DIRECTIVE 92/43/EEC
GROUND WATER 80/68/ EEC
VARIOUS WATER QUALITY
SHIPMENT 93/259/EEC
LANDFILL 199/31/EC
HAZARDOUS WASTE 91/689/EEC
Under revision
Draft
Under revision
NITRATES DIR. 91/676/EEC
INT. POLL. PREVENTION CONTROL 96/61/EC
MINING + EXTRACTION
SEWAGE SLUDGE 86/278/EEC
WILD BIRDS 79/409/EEC
Agriculture
Industry
Proposal
Under revision
INT'L CONVENTIONS
London, Ospar, Helcom, Barcelona Conventions
Basel convention on export of Hazardous Waste
Ramsar Convention for wetlands

2. WASTE FRAMEWORK DIRECTIVE

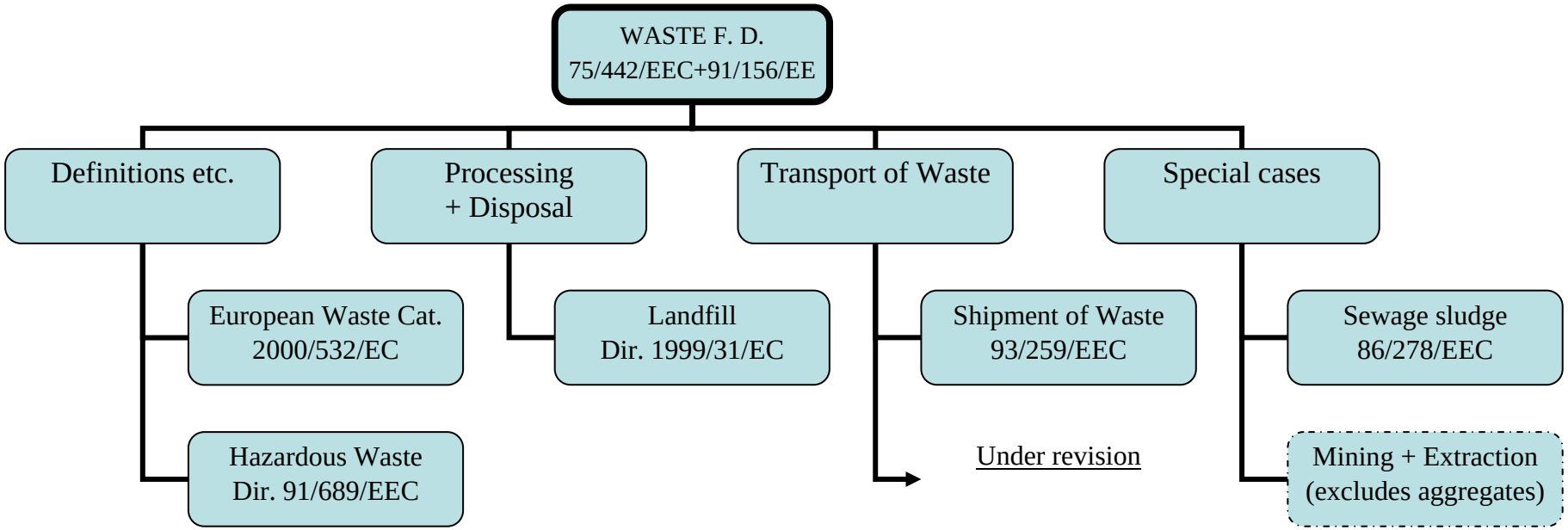
The Waste Framework Directive provides the umbrella for a number of specific directives and regulations and establishes overall policy objectives. The most relevant rules are shown in Diagram 2.

The Waste Framework Directive provides a common terminology and definition of waste. “Waste shall mean any substance or object which the holder discards or intends to discard”.
The directive establishes the following priorities:
(1) Recycling or re-use;
(2) Processing or recovery;
(3) Disposal
The European Waste Catalogue (EWC 2000/532/EC) lists categories of material, substances and objects that could end up as “waste”. It includes as entries:

- 170505 – dredging spoil containing dangerous substances;
- 170506 – dredging spoil (other).

The classification does not refer directly to threshold values for “dangerous substances”

Diagram 2:


WASTE F. D.
75/442/EEC+91/156/EE
Definitions etc.
Processing
+ Disposal
Transport of Waste
Special cases
European Waste Cat.
2000/532/EC
Hazardous Waste
Dir. 91/689/EEC
Landfill
Dir. 1999/31/EC
Shipment of Waste
93/259/EEC
Under revision
Sewage sludge
86/278/EEC
Mining + Extraction
(excludes aggregates)

.

As a general observation it is pointed out that the legislation is based on a framework directive complemented by specific application directives needs careful management in order to remain consistent during the implementation process. The spreading out of specific definitions and the multiple orientations does not necessarily help to clarify matters. In this section the following specific observations are made for the Waste Framework Directive:

(1) The definition of "waste" is fundamental for the interpretation of various provisions. The E.U. definition is completely functional and does not take into consideration the properties of the material under consideration. This is somewhat frustrating for a substance like dredged material, which is basically a natural resource that should preferably be kept in its environmental compartment.
It also leads to misunderstandings as the definition is at variance with others used in international treaties

(2) The view taken by the dredging community is that both relocation of dredged material in or near the water body and/or re-placement into the same environment compartment from which it originates are modes of re-use. If dredged material is too contaminated the options are limited to processing (treatment) or confined disposal.

(3) A further distinction should be made between marine dredging (up to the tidal limit!) which is regulated by the London Convention and the regional conventions (OSPAR, HELCOM, Barcelona …) and inland dredging, which may come under the terms of the Waste Framework Directive and might be affected by quality objectives of the Water Framework Directive.

(4) The decision logic for dealing with dredged material is nearly the same for marine and inland dredging and is illustrated in diagram 3 & 4. The regulatory regime may be different and could affect the threshold levels and trigger points that must be defined to implement the logic.

(5) Some examples:

- Beneficial use:
  - use as fill material;
  - construct artificial islands;
  - use as construction material;
  - soil improvement for agricultural land (fresh water only).

- Relocation:

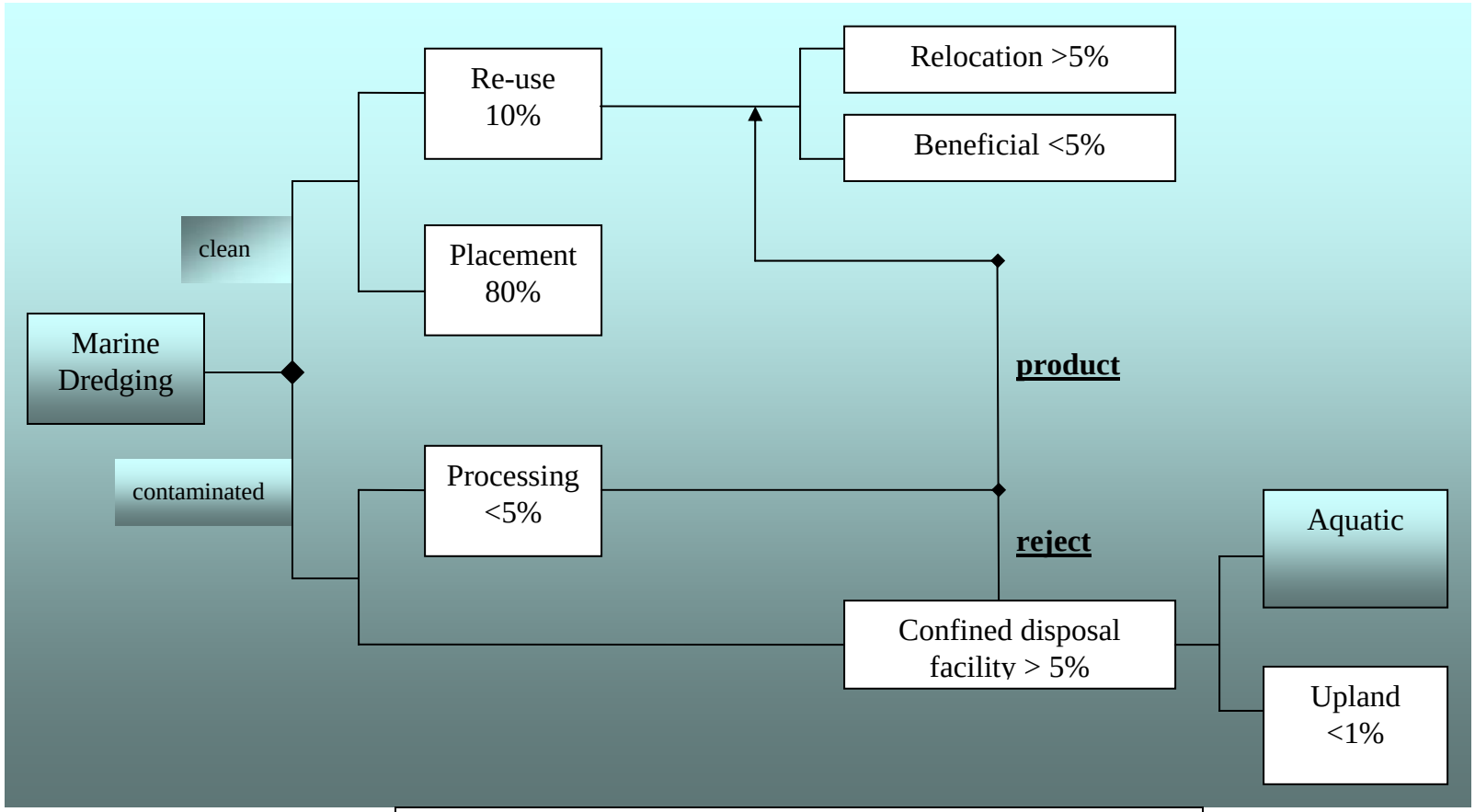
Placing dredged material at specific locations in the environmental compartment so that it fulfils its role in the sediment balance (combat erosion, provide biological diversity).

- Placement:

The disposal of dredged material in its environmental compartment at suitable disposal locations.

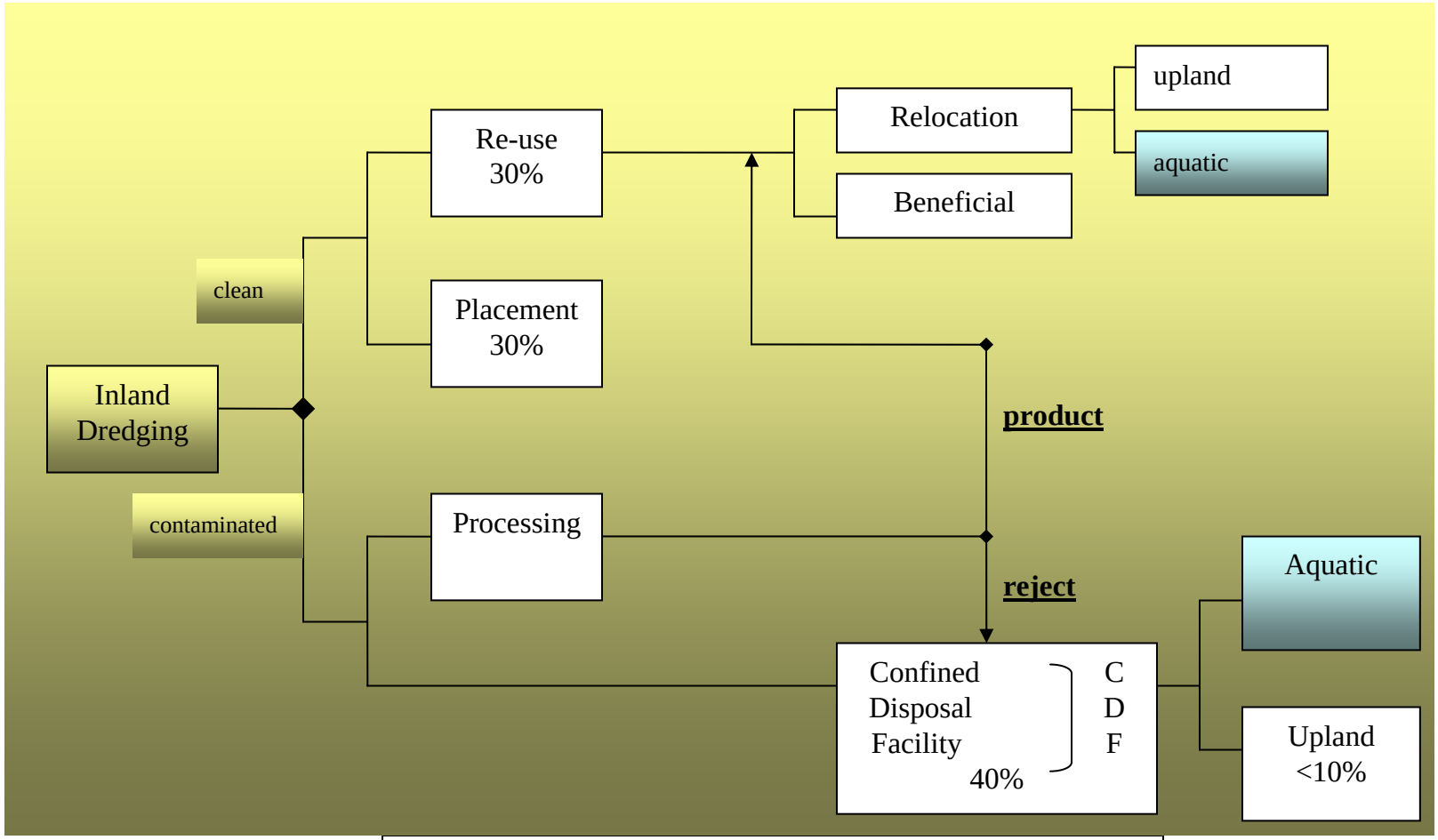
- Processing:
  - Separation of sand and silt
  - Manufacturing bricks
  - Biological treatment to upgrade quality
  - Dewatering, ripening
  - Landfarming

Diagram 3: Decision Logic for Dredged Material Management in a Marine environment



N.-B.: the annual volume of dredged material in the marine environment is estimated at 200-250 million tons/year for the E.U. The % in the diagram indicates roughly the estimated breakdown.

Diagram 4: Decision Logic for Dredged Material Management for inland waters



N.-B.: the annual volume of dredged material in the fresh water environment is estimated at 50-60 million tons/year in the EU. The % indicates the estimated breakdown.

In the following sections the link with specific daughter-directives is touched upon.

2.1. Landfill Directive (99/31/EC)

The objective of the Directive is to prevent or reduce as far as possible negative effects on the environment from the land filling of waste, by introducing stringent technical requirements for waste and landfills.

It defines the different categories of waste (municipal waste, hazardous waste, non-hazardous waste and inert waste) and applies to all landfills, defined as waste disposal sites for the deposit of waste onto or into land. Landfills are divided into three classes:

- landfills for hazardous waste;
- landfills for non-hazardous waste;
- landfills for inert waste.

The Directive does not apply to:

- the spreading on the soil of sludge (including sewage sludge and sludge resulting from dredging operations);
- the deposit of unpolluted soil or of non-hazardous inert waste resulting from prospecting and extraction, treatment and storage of mineral resources as well as from the operation of quarries;
- the deposit of non-hazardous dredging sludge alongside small waterways from which they have been dredged ;
- the deposit of non-hazardous sludge in surface water, including the bed and its subsoil.

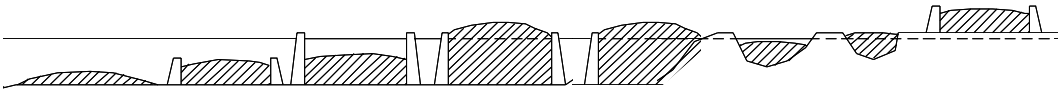
In addition, the 4th recital states:
"Whereas further consideration should be given to (…) the processing of dredging sludge".

This note provides further consideration by outlining the possible applications and uses of dredged material. With respect to the Landfill Directive, this would only apply to Diagram 4 –upland CDF and not to other disposal modes.

However the Directive implies that landfill sites are located above groundwater level. Several disposal facilities have been constructed for dredged material, but they are in most cases filled with water. Such disposal facilities meet stringent criteria for limiting transport of contaminants in groundwater, but are not landfill sites in terms of the Directive.

Proper landfill sites feature measures to isolate the drain water from the environment. Placing dredged material in a landfill facility is one of the most expensive propositions and is only practised when no other solutions are in sight. The conclusion is that the Landfill Directive. has only limited direct impact on the disposal of dredged material, but it certainly has had also an indirect effect by stimulating the design of sub aquatic confined disposal facilities (CDF).
Figure 1. depicts the various possibilities of dredged material disposal facilities. Only the far-right option is a landfill under the terms of the Landfill Directive.

Fig. 1. : Confined disposal facilities



2.2. Hazardous waste (91/689):

Hazardous waste is defined in the form of properties (see Annex to the Directive). From the listing it may be concluded that dredged material is never, or very rarely, hazardous because threshold values are not exceeded. One possible exception could be if an oil spill or petrochemical production facility has lead to a high concentration of petroleum products in the silt. Another category that has not been defined in detail is the potential for ecotoxicological effects. Contaminated dredged material will have some ecological effects, but it is not clear when these are considered to be hazardous under EU law. Some further guidance would be welcome.

2.3. Use of sludge in agriculture (86/278/EEC)

This directive does not apply to dredged material beneficial uses. However, it is the only EU Directive that contains limit values for contaminants and is used by some Member States as a basis for dealing with dredged material.

This directive regulates the limit values for spreading “sludge” on agricultural land. It mainly deals with sewage sludge, but could be used by analogy for spreading dredged material on land.

Requirements set by Directive 86/278/EEC are a crucial element in the management of sewage sludge currently produced in the Member States.

In five countries (Belgium-Flanders, Denmark, Finland, Netherlands and Spain) the limit values for heavy metal in sludge are much lower. Only six Member States (Greece, Ireland, Italy, Luxembourg, Portugal and Spain) have implemented limit values, which are identical to those specified in Annex IB of Directive 86/278/EEC).

It is tentatively concluded that the E.U. limit values for heavy metal are too high and that the Directive needs to be revised. A revision is indeed in preparation.

As a final note we caution that the term “dredging sludge” should be avoided in order to prevent confusion with sewage sludge.

2.4. Shipment of waste

The cross border transport of “waste” is regulated by the Basel Convention and transposed by EU law into specific legislation. This subject may have some impact on the possibility to use clean soil and clean dredged material across borders as a fill material. The specifics will not be discussed here. The Directive has recently been revised.
On the other hand, the Landfill Directive excludes clean soil from being waste and there is some potential for confusion.

2.5. Extractive Industries

The draft EU directive regulating waste from mining has excluded dredging activities used to produce marine aggregates as construction material. *“It excludes from its scope waste which represents low environmental risk, such as unpolluted soil and waste from the exploration of mineral resources”.*

Indeed, during aggregate dredging, material may be dredged which is not beneficial as construction material; this becomes waste and should be dealt with on the same basis as dredged material.

3. Marine Conventions

<u>Comparison with International Legislation for dredged material</u>

In international maritime regulations dredged material has a specific position in its evaluation for sea disposal in comparison to other materials, considered as ‘waste’. In principle dredged material is considered as ‘a resource rather than as a waste, unless specific substances in the material make it indicate otherwise’.

The Eighteenth Consultative Meeting of Contracting Parties to the London Convention 1972 (4 - 8 December 1995) adopted the "Dredged Material Assessment Framework" by resolution LC.52(18). Article 1.2 of this meeting states:
‘Within the framework of the London Convention 1972, Contracting Parties have recognized that dredged material, due to its characteristics, can be managed separately from waste materials’.

The Dredged Material Assessment Framework gives in Article 1.1:
'Dredging is essential to maintain navigation in ports, harbours, marinas and inland waterways; for the development of port facilities; for flood mitigation; and for removal of sediments from structures, basins and water intakes. Much of the material removed during these necessary activities may require disposal at sea. The greater proportion of the total amount of material dredged worldwide is, by nature, similar to undisturbed sediments in inland and coastal waters. A smaller proportion of dredged material, however, is contaminated by human activity to an extent that major environmental constraints need to be applied when considering disposal or use of these sediments'.

The London Convention (1972), Article 11 of Annex 1, specifies Industrial waste as from 1 January 1996.
For the purposes of this Annex:
"Industrial waste" means waste materials generated by manufacturing or processing operations and does not apply to:

a) dredged material;

b) ...

The 1996 Protocol to the London Convention expresses the same principle in slightly different wording:
Annex 1:
'The following wastes or other matter are those that may be considered for dumping being mindful of the Objectives and General Obligations of this Protocol set out in articles 2 and 3:
.1 dredged material
.2 …'.

The OSPAR Convention (1992), derived from the London Convention and being followed by the Barcelona and Helcom Conventions states in Annex 2, Article 3:
(1) 'The dumping of all wastes or other matter is prohibited, except for those wastes or other matter listed in paragraphs 2 and 3 of this Article.
(2) The list referred to in paragraph 1 of this Article is as follows:

c) dredged material;

d) …

All these conventions use the framework provided by DMAF to define whether dredged material is suitable for specific application or should be disposed off at sea. Diagram 5 outlines this structure.

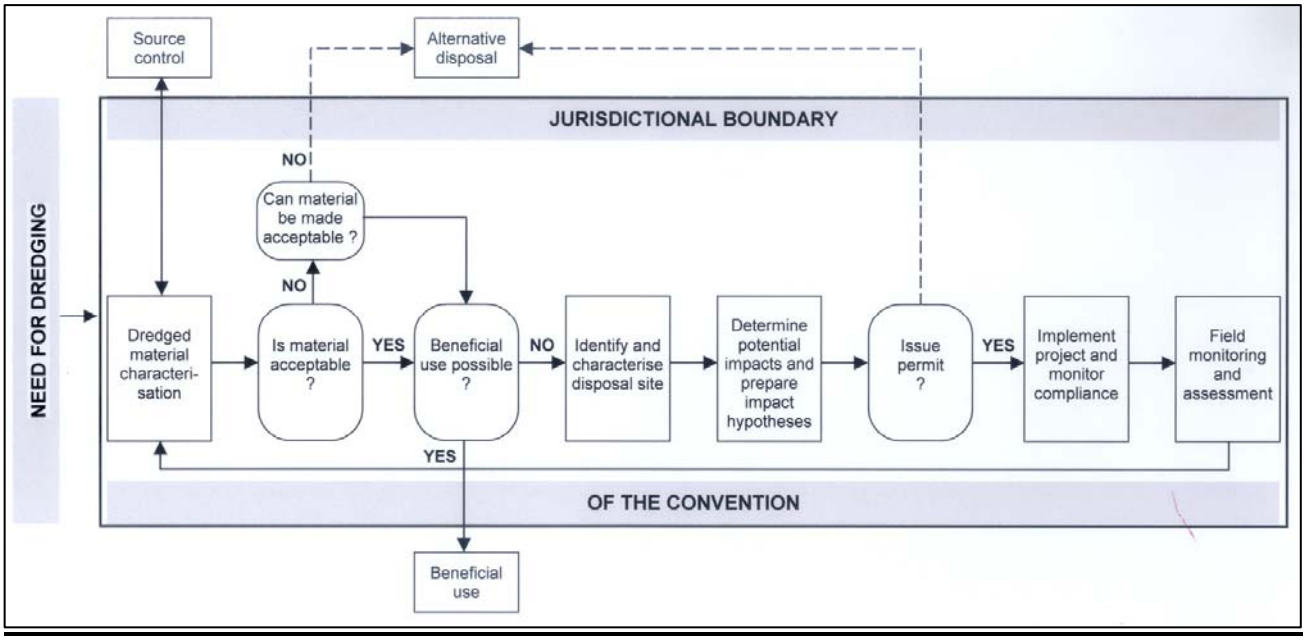


Diagram 5: structure of DMAF

The logic contained in diagram 5 is very similar to the above diagrams 3 & 4, although presented in a different format that indicates the jurisdictional boundary of the marine conventions. "Alternative disposal" practices as indicated in the top box in Diagram 5 would most likely fall under the umbrella of the Waste Framework Diective.

4. Overall conclusion on Dredged Material management options

4.1. For marine dredging the international marine conventions as implemented by national Member States are applicable.

For inland dredging the Waste Framework Dir. applies as a general rule. The main impact comes from the concept of "Waste". The definition of waste is not fit for dredged material, which is primarily a resource.

4.2. The priorities for "waste" management established in the Waste F.D., namely:

(1) Re-use or recycling,
(2) Processing or treatment,
(3) Disposal,

are strictly followed in the existing management practices for dredged material. The caveat is that placement of dredged material in the same environmental compartment

as where it was dredged, is a beneficial use of natural resource material and is not ‘discarding’.

4.3. The landfill directive is only relevant in a restricted number of situations, when upland disposal is the solution of last resort.

4.4. The direct impact of the Sewage Sludge Directive is nihil, but the concept that spreading on land of resource material is improving quality of (agriculture) soil and is thus a beneficial use applies also to dredged material.

4.5. The Hazardous Waste Directive would only apply to extreme cases of pollution.

However, the notion of ecotoxicity could benefit from further definition.
The classification of dredged “spoil” in the European Waste Catalogue, which makes a distinction between dredged material and dredged material containing dangerous substances, is not very helpful either as long as no threshold or limit values for dangerous substances are defined.

5. WATER POLICIY

Water is one of the most comprehensively regulated area of EU environmental legislation. Early European water policy began in the 1970s with the First Environmental Action Programme in 1973 followed by a first wave of legislation, starting with the 1975 Surface Water Directive and culminating in the 1980 Drinking Water Directive. This first wave of water legislation included water quality standard legislation on fish waters (1978), shellfish waters (1979), bathing waters (1976) and groundwater (1980). In the field of emission limit value legislation the Dangerous Substances Directive (1976) and its Daughter Directives on various individual substances were adopted.

A second wave of water legislation followed a review of existing legislation and an identification of necessary improvements and gaps to be filled. This phase of water legislation included the Urban Waste Water Treatment Directive (1991) and the Nitrates Directive (1991). Other elements identified were revisions of the Drinking Water and Bathing Water Directives to bring them up to date and the development of a Groundwater Action Programme. Also, for large industrial installations, the Integral Pollution Prevention Control (IPPC) Directive (finally adopted in 1996) covered water pollution as well.

During this time it had become, after extended discussion at Member States' and Community level, increasingly clear that an efficient protection of water needed emission limit value legislation as well as water quality standards legislation, i.e. so-called "combined approach".

5.1. The Water Framework Directive

The Commission adopted, in February 1997, its proposal for a Water Framework Directive. Its purpose is to establish a framework in order to achieve the following four main objectives of a sustainable water policy:

- Sufficient provision of drinking water
- Sufficient provision of water for other economic requirements
- Protection of the environmental status
- Alleviation of the adverse impact of floods and droughts.

This proposal has evolved to become Directive 2000/60.

The environmental objective of the Directive is to achieve "good status" for all groundwater and surface waters. To this aim, it established river basin management based on assessment of the characteristics of the river basin; monitoring of the status of its surface and groundwater; definition of quality objectives; establishment of programmes of measures to achieve the defined objective. However, the

administrative structure to achieve this river basin management is left to the discretion of Member States.
The key elements are:

- All waters are covered: surface waters, rivers, lakes, coastal waters and also groundwater. The goal is that water quality gradually improves and all waters in the EU achieve a good quality ("good status") by 2015.
- One coherent management frame based on river basins and involving all water-related legislation.
- Participation of representatives of all stakeholders in the consultation process.
- Economic instruments are introduced to support environment objectives.
- As a framework directive it is ambitious and binding on objectives, whilst flexible on ways and means to achieve them.

A framework directive is precisely what the term suggests:

- It provides a frame for the development of more detailed policies and implementation aspects.
- It leaves flexibility to accommodate specific and local conditions that may have a bearing on water quality.
- In this particular case the WFD also integrates pieces of existing legislation concerning quality of water.

The programme of measures currently under development follows the above-mentioned combined approach, using the setting of emission limit values and water quality standards. In this context the full implementation of existing EU emission limit value legislation has to be updated i.e. Urban Waste Water Treatment Directive, IPPC Directive, Plant Protection Products Directive, and Dangerous Substances Directives. In addition, the water quality standards established under the Water Framework Directive and other relevant EU water legislation (e.g. Bathing Water Directive) have to be complied with.

The implementation phase covers notably, amongst others, the following assessments:

- Assess the impact of human activities on surface waters and groundwater with each river basin, taking into consideration pollution from point sources, pollution from diffuse sources, water abstraction and other human activities with an impact on water status.
- Establish river basin management plans based on an assessment of water needs, impacts of human activities on the water bodies and setting objectives for water quality and quantity.

The question has come up to what extent this framework directive may have an impact on dredging activities. Water quality is obviously affected by the environment where it is found. The Directive itself only refers to sediment in the definition of "environmental quality standard" namely "the concentration of a particular pollutant

or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment".

The link between sediment quality and behaviour and the water quality is not addressed in the framework directive, but gradually emerges via the Common Implementation Strategy (CIS). On this point no final conclusions can be drawn.
Nevertheless, the following remarks can be made:

i. The WFD identifies ecological status and chemical status as two main indicators of water quality.

ii. The Annex II to the WFD describes reference conditions for water bodies, namely biological, physico-chemical and hydro-morphological elements.

iii. A number of Guidance Documents have been developed by the Water Directors to help with the application of the WFD. The guidance documents establish that the ecological status is composed of three sets of elements: biological, physico-mechanical and hydro-morphological and points out that the physico-chemical and hydro morphological elements support the biological element. One may submit that dredging activities have some impact on hydro morphology of the water body and may cause transient effects in the physico-chemical status. However, this should not lead to restrictions on dredging; this link has been dealt with in the Pressure and Impacts analysis (P + I) developed under the authority of national Water Directors.

iv. The provisional P + I analysis includes in its Annex II.1 a table which lists the specified uses for heavily modified water bodies and possible pressures and impacts.
The specified uses for a HMWB include navigation. This activity may have a wide range of positive or negative impacts on the water body, mainly via hydro morphological impacts and pressures.
The important aspect is that specified uses - such as navigation - are recognised as valid activities under Art. 4.3 of the WFD.
One of the potential pressures resulting from navigation is maintenance dredging of channels and ports.

v. Dredging may also cause temporary changes to the physico-chemical quality of water bodies – the main mechanism is via suspended particles that carry contaminants which could be released into the water body. This phenomenon is restricted in time and space and is not expected to have major (long-term) impact on the biological quality of the water.

vi. The conclusion from the above is that:

- Dredging may have a longer term impact via changes in hydro morphology;
- Dredging has a short-term impact on physico-chemical conditions;
- Dredging may therefore have a limited effect on the biological condition and thus on the ecological status. This impact would take place via disturbance of the benthic community in the sediment and has only an indirect effect on the water body.
- Maintenance dredging is always in support of other specified uses, primarily navigation, and as such will mainly take place in heavily modified water bodies (or even artificial water bodies), for which the quality objectives are less stringent.
- Consequently, there is a weak link between the WFD and dredging activities, which is not expected to lead to restrictions of dredging work. There is still some concern that misinterpretation of the WFD could lead to restrictions imposed on maintenance dredging.

The Water Framework Directive must be implemented by a host of detailed provisions that will be transposed into national regulatory provisions. The two "daughter" documents that touch upon dredging and disposal of dredged material are reviewed below.

5.2. Groundwater Directive

An existing directive 80/68/EEC on the protection of groundwater pollution caused by certain dangerous substances will be replaced and ten be integrated in the Water Framework Directive.
The existing directive seeks to control the direct and indirect discharge of certain substances into the groundwater. This is to achieve primarily by an authorisation system for discharges as well as disposal or tipping. For certain substances and groups of substances any discharge to groundwater is prohibited ("list I substances") must be subject to an elaborate authorization procedure. Member States are to monitor compliance with the authorization and the effects of discharges.

The new Directive has been under preparation since 2003 and currently is in the final legislative stage. There are provisions on the characterisation of chemical status and threshold levels of certain substances. Disposal of dredged material might only be possible if it is demonstrated that the disposal site does not give rise to supplementary dispersion of contaminants into the groundwater body. The permits must contain the conditions on how to limit emissions of undesirable substances to the bare minimum. Disposal of dredged material is possible, but may in specific cases face restrictive conditions.

5.3. Daughter Directive

Decision 2455/2001/EC contains a list of 33 priority substances the release of which into water bodies should be kept to a minimum.

In addition a list of hazardous priority substances may be established in the future, containing substances that may not be released into the water body.
These listed chemicals will become part of a "Daughter" Directive that will define Ecological Quality Standards (EQS). Currently only draft versions of the proposed EQS are available. The Directive proposes to set limit values for the whole water column (including suspended matter).
This approach does not seem practical as it does not account for large natural variability of suspended matter, nor for the effects of specified uses (i.e. dredging). EuDA will closely monitor further developments.

6. NATURE PROTECTION

The Habitats Directive 92/43/EEC has become the main mechanism for protecting European species of fauna and flora as well as their habitats. It establishes an EU-wide framework to maintain biological diversity by the conservation of natural habitats and wild fauna and flora. The Birds Directive 79/409/EEC protects wild birds species and sites of importance for the maintenance of populations of wild birds. It establishes a scheme for the protection of all naturally occurring species of wild birds in the Community, their eggs, nests, young and habitats. It requires the identification and adequate protection of breeding sites and sites of importance for migratory species, it regulates hunting seasons and practices.

6.1. Habitats

Directive 92/43/EEC on the conservation of natural habitats, wild fauna and flora aims for the maintenance of biodiversity within the European territory of the Member States through the conservation of natural habitats and of wild fauna and flora. Many habitats types in Europe have been deteriorated and a growing number of species have become threatened and are increasingly rare. The directive aims to establish a "favourable conservation status" for habitat types and species selected as being of EU interest. This is defined broadly for both habitats and species by reference to factors such as species population dynamics, trends in the natural range of species and habitats, the area of habitat remaining and the proportion in a Member State.

6.2. Wild birds

Directive 79/409/EEC on the conservation of wild birds establishes a scheme for the protection of migratory wild birds and their habitats. A general duty is placed on the Member States to maintain the population of all species of naturally occurring birds in the wild state in the EU at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements. This is to be done by preserving, maintaining or re-establishing a sufficient diversity and area of habitats; that is, by creating protected areas, managing habitats inside and outside protected areas, re-establishing destroyed biotopes and creating new ones.

Member States are required to take special measures to conserve the habitats of listed vulnerable species as well as migratory species, in particular by designating as Special Protection Areas, (SPAs), and the most suitable territories for these species. Special mention is given to wetlands in this regard. The protection regime for the SPAs is now defined under the Habitats Directive.

6.3. Natura 2000

A European ecological network known as “Natura 2000” will be established. Each Member State has drawn up a list of the sites within their territories which are of potential EU importance (“Sites of Community Importance”). The areas listed are in proportion to each Member State’s share of the habitat type in need of protection. Once confirmed, the sites selected under the Habitat Directive are designated Special areas of conservation.

Special areas of conservation are defined as sites of Community importance designated by the Member States through a statutory, administrative and / or contractual act where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and / or the populations of the species for which the site is designated.

The network of sites designated by Member States as either

- Special areas of conservation under the Habitat Directive;
- Special protection areas under the Wild Birds Directive,

forms an ecological infrastructure and is designated as Natura 2000.
Both types of sites are frequently found near estuaries, covering wetlands or along coastlines. Marine sites have also been designated. The presence of these sites could lead to restrictions in dredging permits for work in their vicinity.

6.4. Protection measures

The protective regime for Natura 2000 sites is outlined in the Habitat Directive and covers provisions for routine activities near the site as well as for evaluation of development projects to be implemented at or near a designated site.

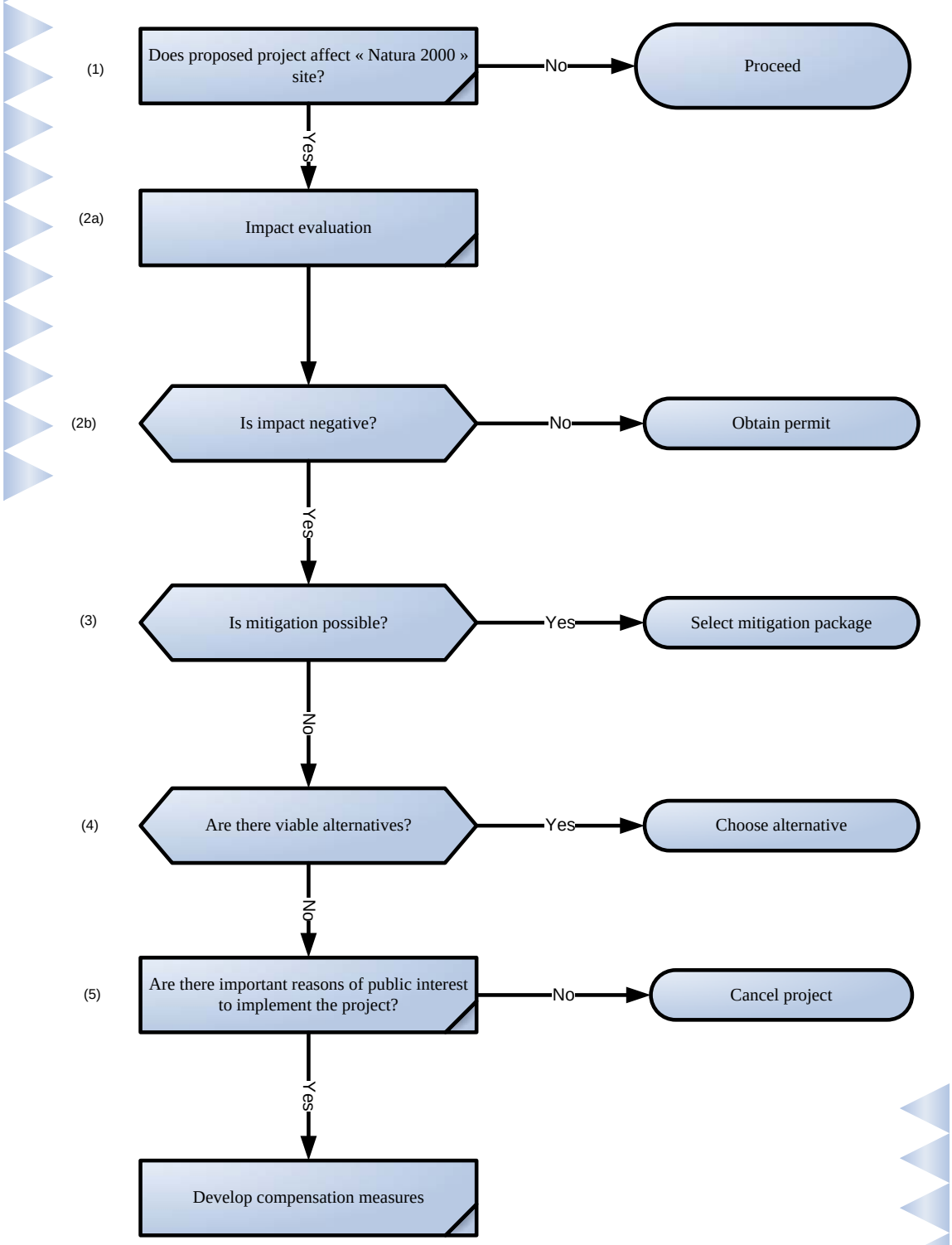
Art. 6.1 and 6.2 deal with the management of sites. It calls for special conservation measures or management plans for the sites. This could include for example the establishment of an exclusion zone for a marine site.
The management plan for a site could thus affect indirectly operational dredging activities; aggregate dredging or marine disposal sites for dredged material could be affected by the need for relocation.

A more remote constraint on dredging may be the result of hampering infrastructure development caused by the proximity of Natura 2000 sites.

Art. 6.3 and 6.4 deal with the planning and approval of projects that are likely to have a significant effect on a Natura 2000 site. Such project, once demonstrated that they have an impact, may only be allowed if there are overriding measures of public interests.

The decision logic is shown in Fig. 2:

Figure 2. Simplified logic of Art. 6 of habitats Directive



The decision making has been tested a number of times in national courts. This resulted in severe restrictions on new port development projects and coastal infrastructure works. The overall effect for the dredging industry is a restrictive market for capital dredging works for ports in the EU.