

**FINAL REPORT**

**SPACE FOR WASTE:  
The Waste Management Subject Plan**

**Position Paper on  
Disposal of Waste at Sea**

**Environmental Management Unit**

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# Contents

<b>CONTENTS</b>	<b>2</b>
<b>PURPOSE OF THE PAPER</b>	<b>3</b>
<b>BACKGROUND</b>	<b>3</b>
<b>CURRENT SITUATION</b>	<b>3</b>
<b>LEGAL FRAMEWORK</b>	<b>5</b>
<b>National</b>	<b>5</b>
Marine Pollution Act, 1977 and Environment Protection Act, 1991	5
Deposit of Wastes and Rubble (Fees) Regulation, 1997	6
Antiquities (Protection) Act, 1925	6
Development Planning Act, 1991	6
Jurisdiction over territorial waters	6
<b>International</b>	<b>6</b>
United Nations Convention on the Law of the Sea	6
London Convention	7
Barcelona Convention	8
Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft	8
Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources	8
<b>THE POTENTIAL IMPACTS OF DUMPING-AT-SEA</b>	<b>9</b>
<b>General</b>	<b>9</b>
<b>Impacts</b>	<b>9</b>
<b>THE PLANNING AUTHORITY'S POSITION</b>	<b>10</b>

## **Purpose of the Paper**

The scope of this paper is to analyse the current waste management situation with regards to disposal of waste at sea. The document analyses the legal, technical and environmental implications associated with this issue and outlines the Planning Authority's position on the subject. The document is intended to provide guidance for the development of an official policy on dumping-at-sea for inclusion in the Waste Management Subject Plan for the Maltese Islands.

## **Background**

The Planning Authority is currently finalising the Waste Management Subject Plan for the Maltese Islands, which will be published by mid 2001. The Authority has already issued a draft of this plan for public consultation and received a substantial amount of comments from the public. Among these comments, there were a lot of varied suggestions concerning the use of the sea as a location for the dumping of various forms of waste. The most common recommendation was that of dumping inert waste at sea, with the possibility of using the same inert waste for sea reclamation with a view to extend the present landmass. Over the last months, the Maltese Government has also indicated the possibility of using the sea as a location where inert waste could be dumped.

The Planning Authority considers that the dumping of waste at sea has potential environmental implications that could be translated into economic and social impacts if not adequately controlled. Due to the importance of this subject and also due to the recent general attention that this issue has received, it has been decided to study the issue and formalise the Planning Authority's position on the subject.

## **Current Situation**

Waste management in Malta is currently almost entirely dependent on the landfill option. Landfills in the Maltese Islands have now become notorious particularly because of evident environmental impacts, notably visual impact and emissions arising from the spontaneous combustion of waste. Over the last years large volumes of inert waste have been generated by the construction industry, with the consequence that existing landfills (actually landraise facilities) had to be raised to significantly higher levels in order to accommodate all the wastes being generated. This has led to considerable visual impacts.

Most of the waste entering landfills is in fact inert waste, generally comprising more than 80 percent of the total waste generated in Malta. The Maghtab landfill alone

receives more than one million tonnes of inert waste every year (State of the Environment Report, 1998). More quantities of this waste are landfilled in disused quarries, in the main landfill in Gozo, dumped at sea, and also fly tipped in various locations in the countryside.

The landfilling of inert waste is posing increasing pressures on the regulators to identify new void space for this activity. Since for a number of reasons licensed void space has been difficult to secure, Maghtab landfill has remained the main site authorised for the disposal of this waste stream. Since the environmental impacts (in particular visual impacts) associated with this landfill have now grown beyond proportion and there is significant pressure to close down Maghtab, regulators are seeking alternative solutions to the inert waste management problem. Among many suggestions as to possible solutions to this problem, some view the dumping of inert waste at sea as a quick solution. There were even suggestions to move material currently present at Maghtab and dump it at sea. The latter option could present significant problems since the inert material at Maghtab is commingled with other wastes rendering it contaminated to a high degree. Such an approach would be unsustainable unless material is treated and rendered completely inert.

Currently limited quantities of inert waste originating from some major projects going on in Malta are already being dumped at sea, without any specific environmental assessment<sup>1</sup>. This dumping is generally done in an official dumpsite that has existed since the British occupation of Malta (location indicated in Figure 1). Selection criteria for this dumpsite have primarily been influenced by maritime operations related to safety of navigation and possibly transportation costs. Dumping of this waste stream at sea is perceived as a possible solution to the problem that has created Maghtab, however the environmental implications of such an option are not always given the due consideration that is merited, especially when dumping-at-sea in locations close to the shore is considered.

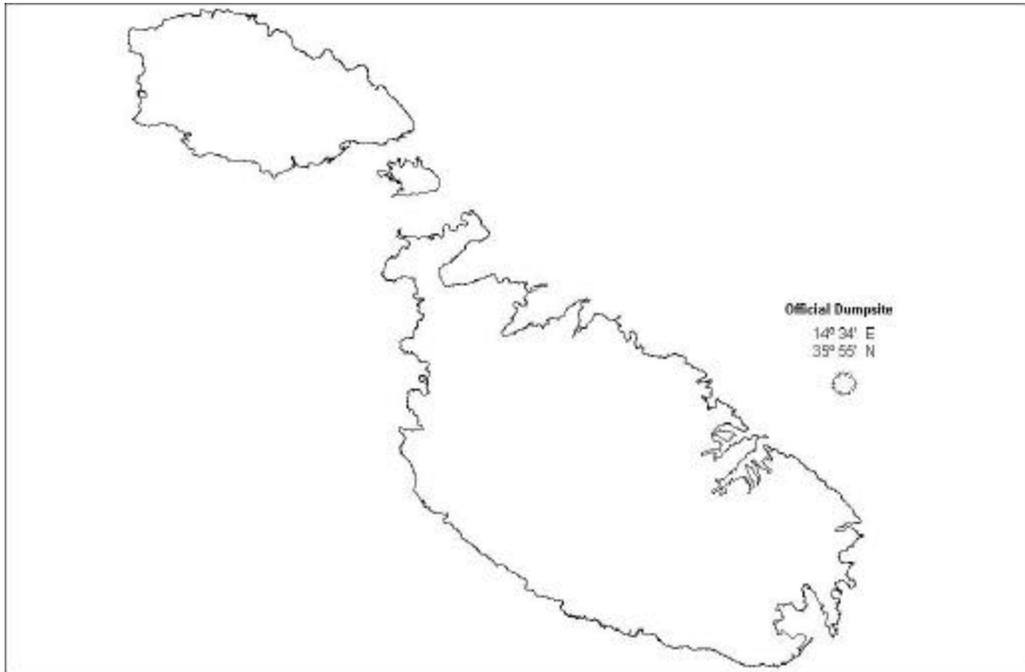
Being a densely populated nation state with a resident population of around 400,000, Malta's infrastructure needs have to be met within the limited space available. Power stations, desalination plants, ports and harbours all require coastal locations to operate effectively. Over the years, the accessible part of the coastline was modified and used extensively by a variety of uses all competing for the limited space and resources available. Additionally over 1 million tourists require accommodation and recreational facilities, which over time have taken up considerable stretches of the coast.

Locating a marine dumpsite close to the shore without any consideration of the physical properties of the site may lead to a significant impact on the natural and socio-cultural value of the coastal environment. This is particularly relevant to Malta,

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<sup>1</sup> Further to the issues concerning the dumping of inert waste at sea, it is also worth mentioning that a report prepared by METAP for the Maltese Government claims that a significant amount of oil waste is dumped in landfills or in sewers and is eventually polluting the marine environment (Rambøll, Hannemann & Højlund, 1993, Solid Waste Management Strategy - The Republic of Malta). The same report also says that around 17000 tonnes of Cu/Ni grit originating from the dockyards is also being disposed of at sea. Cu/Ni grit is considered to be hazardous, particularly due to the fact that it is often contaminated with TBT compounds. This dumping is in direct contravention of international obligations and the issue should be given urgent consideration by the Government.

since in addition to the problems associated with environmental damage itself, such damage may impact the highest income-earning sector, tourism, which is highly dependant on the natural resources of the coast, for a number of tourism products. It is envisaged that certain construction projects involving development on the coast may require the dumping of waste at sea as an integral part of the project. Due to the diversity of such potential projects, associated environmental impacts would also be diverse. Consequently the impacts of such projects have to be considered individually on their own merits.



**Figure 1: Official Marine Dumpsite (Coordinates refer to ED 50 Datum)**

## **Legal framework**

The issue of the dumping of waste at sea has to be viewed within the existing legal context. National legislation governing this area is quite limited however Malta has a number of international obligations with respect to this issue that provide the context within which dumping-at-sea could be regulated.

### **National**

#### **Marine Pollution Act, 1977 and Environment Protection Act, 1991**

The Marine Pollution Act 1977 never entered into force and it was intended to be replaced by section 25 of the Environment Protection Act of 1991. The provisions of section 25 of the EPA have not as yet come into force and the great probability is that

this section will never come into force since the EPA is expected to be repealed and replaced by a new act which is currently being under discussion in Parliament.

### **Deposit of Wastes and Rubble (Fees) Regulation, 1997**

The main relevance of these regulations to the issue of dumping-at-sea is that they provide for the imposition of a disposal fee for every tonne of waste deposited at sea. This charge is levied by the Ministry for the Environment.

### **Antiquities (Protection) Act, 1925**

The Antiquities (Protection) Act provides for the protection of underwater archaeological remains within the Maltese Territorial Waters.

### **Development Planning Act, 1991**

This act, as amended in 1997, states that all development including development carried out at sea requires a development permit. The act also provides for the requirement to carry out Environmental Impact Assessments for certain developments that have the potential to create environmental damage. The act also caters for the protection of national heritage including underwater archeology, marine life, etc. within the Maltese Territorial Waters, or to the protection of same heritage by Listing and Scheduling.

### **Jurisdiction over territorial waters**

The MMA is the agency that is empowered by law to have overall jurisdiction of the territorial waters and to prevent and control marine pollution. Official dumping sites are identified by the MMA but since the agency's effort is mainly directed towards navigation and shipping, there has been a trend for matters related to marine pollution to be geared towards safeguarding navigation.

## **International**

The dumping of waste generated on land into offshore dumpsites by means of specialised dumping vessels has been carried out for a long time by industrialised countries. This section discusses international regulation that is intended to prevent marine pollution from this practice. The main legal instruments that bind Party States to prevent and control marine pollution and to which Malta is signatory are the United Nations Convention on the Law of the Sea, the London Convention and the Barcelona Convention and its related Protocols. This section provides a brief outline of the relevant obligations of signatory states.

### **United Nations Convention on the Law of the Sea**

The UN Convention on the Law of the Sea, 1982 (UNCLOS) gives a framework for the determination of the rights and obligations of States relating to oceans. Part XII contains provisions with regard to protection and preservation of the marine environment.

States are obliged to undertake measures in preventing and controlling pollution of the marine environment. The Convention makes provisions for individual States by invoking them to use the *best practicable means* at their disposal and *in accordance with their capabilities* (Art 194). This is not a loophole through which States can carry out activities that may cause pollution in the marine environment. The Convention still calls for States to design measures that will *minimise to the fullest possible extent* the release of toxic, harmful or noxious substances, especially those which are persistent, from land-based sources, from or through the atmosphere or *by dumping* (Art 194).

Recognising that appropriate waste management strategies can provide measures which reduce those sources of marine pollution, the Convention calls for Party States to *act so as not to transfer, directly or indirectly, damage or hazards from one area to another or transform one type of pollution into another* (Art 195).

There is a clause that caters for sovereign immunity, which exempts vessels and aircraft, owned or operated by a State and used for the time being on government non-commercial service, from the provisions of the Convention. However the Convention still binds States to act in a manner that prevents and controls marine pollution stating that each State shall ensure, by the adoption of appropriate measures not impairing operations or operational capabilities of such vessels . . . owned or operated by it, that such vessels . . . *act in a manner consistent, so far as is reasonable and practicable with this Convention* (Art 236).

The failure to fulfil these international obligations makes States liable in accordance with international laws (Art 135).

However interpreted, the provisions of this convention lend support to a comprehensive approach to waste reduction, management and disposal, encompassing all potential sources of marine pollution and careful consideration of disposal options.

### **London Convention**

Every party to the Law of the Sea Convention must enact and enforce measures that are no less effective than the London Convention even if it is not a party to the London Convention<sup>2</sup>. The Convention defines dumping as wastes or other matter transported by or to vessels, aircraft, platforms or other man-made structures at sea, operating for the purposes of disposal of such matter or derived from the treatment of such wastes or other matter on such vessels, aircraft, platforms or structures (Art III).

The Convention identifies three categories of wastes or other matter depending on their impact on the marine environment. The London Convention uses a so-called ‘black and grey list’ approach. The black list (Annex I within the convention) contains substances, the dumping of which is prohibited. These substances include fuel oil, lubricating oils, organohalogen compounds and Mercury and Cadmium and their compounds. The grey list (Annex II within the convention) contains substances the dumping of which is only permitted under strict control and provided certain

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<sup>2</sup> Malta is one of the 78 contracting parties to the convention.

conditions are met. The grey list includes wastes containing significant amounts of copper, nickel and their compounds. The dumping of all other wastes or matter requires a prior general permit (Art IV) issued by the national competent authority. Within the London Convention inert waste (although not directly referred to) is considered to fall within the grey-list. Within the 1996 Protocol, inert waste (specifically referred to, as inert, inorganic geological matter) is one type of waste that may be considered for dumping<sup>3</sup>.

Any permit shall be issued only after careful consideration of all the factors set forth in Annex III, including prior studies of the characteristics of the dumping site, as set forth in Sections B and C of Annex III. These include location in relation to depth, distance from coast; rate of disposal; hydrographic and bathymetric characteristics. Effects on amenities, marine life and other uses of the sea should also be considered. A significant consideration that is listed is *the practical availability of alternative land-based methods of treatment, disposal or elimination, or of treatment to render the matter less harmful for dumping-at-sea.*

Nonetheless, acceptance of dumping under certain circumstances shall not remove the obligations to make further attempts to reduce the necessity for dumping, i.e. dumping-at-sea should be considered as a last resort.

### **Barcelona Convention**

The Barcelona Convention is a framework convention that includes protocols intended to prevent marine pollution originating from the dumping of waste at sea. An overview of the protocols is provided below.

#### *Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft*

This Protocol is similar to the London Convention where a list of substances whose disposal is prohibited is given. Another list of substances requiring a special permit for discharge is also given. The characteristics of the dumpsite and deposition methods are to be evaluated and parameters are outlined in Annex III of the protocol.

#### *Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources*

This Protocol applies to polluting discharges reaching the Protocol Area from land-based sources within the territories of the Parties. Annex I lists those substances which are to be prohibited from being discharged into the sea. These substances have been selected on the basis of their *toxicity, persistence and bioaccumulation*. Substances listed in Annex II, which include substances such as copper, nickel and their compounds, crude oils and hydrocarbons of any origin and *substances which, though of a non-toxic nature, may become harmful to the marine environment or may interfere with any legitimate use of the sea owing to the quantities in which they are discharged.*

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<sup>3</sup> Malta has still not ratified or exceeded to the 1996 protocol.

Annex III indicates those parameters that must be considered when issuing authorisation for dumping. These include, characteristics and composition of the waste and characteristics of the discharge site and receiving marine environment.

## **The potential impacts of dumping-at-sea**

This section provides a brief outline of the effects and risks associated with dumping of waste at sea.

### **General**

The marine environment incorporates the seabed and water column. Pollutants have no boundaries in the aquatic medium and are transported by diffusion, by currents and wave motion in a three dimensional manner.

Marine pollution may be caused by various factors. Substances can result in marine pollution due to their particular characteristics such as the quantity of a substance, particle size, composition, etc. Another critical factor influencing the extent of impact inflicted on the marine environment is the frequency of dumping/disposal and the consequential extent of exposure to polluting substances. The existing characteristics of the area around the dumpsite such as benthic environment, Chemical and Biological Oxygen Demand (COD, BOD) levels, bathymetry and currents are also important variables.

The location of a dumpsite close to the shore is likely to cause more damage since coastal areas sustain ecologically sensitive benthic habitats some of which are of economic significance (e.g. nursery/fishing grounds). The importance of the coastal fringe is due to the fact that up to depths of around 50m, it supports unique habitats that are important in terms of biological diversity. The damage to such habitats could be irreversible. Some of these ecosystems also buffer the coast against wave action thereby reducing coastal erosion. Coastal areas are also important for their amenity value and any dumping occurring in these areas may affect a variety of uses ranging from bathing, water quality for desalination, aquaculture, etc.

### **Impacts**

Irrespective of whether the waste is hazardous or not, three likely impacts are envisaged to arise from dumping-at-sea, namely increased turbidity of the water column, obliteration of the benthic environment<sup>4</sup> immediately beneath the marine dumpsite and smothering of benthic habitats from the settlement of suspended particles.

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<sup>4</sup> The 'benthic environment' is the seabed and the sub-stratum including all the habitats it sustains.

Turbidity of the water column is caused by the particles in suspension; the smaller the particles the longer the suspension period. Increased turbidity reduces light penetration effecting both benthic habitats as well as plankton. There have been instances where the health of pelagic species has also been affected especially through the clogging of fish gills leading to increased infertility. The severity of the impact depends on the frequency of dumping. With short term dumping although the water column will clear eventually, some negative impact will result. The likelihood of severe impact increases with prolonged dumping. The water circulation pattern of the area will affect the rate of dispersal of suspended material.

Dumped material will eventually settle on the seabed. As a result of this the area immediately below the dumpsite is impacted severely and the local benthic environment smothered. Obviously the impact will be smaller on bare sandy areas, however if these areas are located in inshore waters, the currents can transport material to other adjacent areas. The longer the process, the wider the affected area. Deposited material may also impair the possibility of utilising minerals and other resources on the seabed, generating potential economic costs in the long term.

The severity of impact on the marine environment is particularly dependent on the bio-chemical nature of the material that is dumped. The impacts associated with dumping inert waste are limited to those described above, namely smothering of seabed and increased turbidity. In the case of dumping (or reclamation) in shallow areas close to the shore, the impacts will also be extended to changes in currents and the hydrodynamic regime of the area and the promotion of associated impacts related to sediment transport phenomena such as coastal erosion and sediment accumulation. Another potential problem that could be associated with 'inert' waste is that the waste may be contaminated with non-inert substances, potentially of a polluting or even possibly hazardous nature.

Hazardous waste has the potential for generating a range of impacts. The most negative impacts are those associated with bioaccumulation of heavy metals and inorganic substances in benthic as well as pelagic species (particularly aquaculture species since these are caged within the same location). Besides threatening biodiversity, there is a risk towards human health and safety, following either the consumption of these species or through contact with the contaminated water column (through bathing). In coastal areas, there is a risk of hazardous material that has settled on the seabed to be brought back into circulation through dredging (associated with coastal development) and possibly as a result of trawling activity or in shallower waters, storm action.

## **The Planning Authority's Position**

This section outlines the position of the Planning Authority on the issue of dumping-at-sea:

- The Planning Authority recognises that while dumping-at-sea may be used as a temporary solution to the problems associated with the disposal of inert waste, it is also quite evident that by utilising such a disposal option one can

give rise to potentially serious environmental problems, particularly in the unfortunate event that hazardous substances find their way unknowingly or illicitly to the marine environment.

- Dumping-at-sea shall be avoided as much as practicably possible. Dumping-at-sea shall only be acceptable when land-based alternatives have been exhausted and when it can be demonstrated that dumping-at-sea is the Best Practicable Environmental Option (BPEO) for the particular waste stream that needs disposal.
- Only inert waste originating from construction and demolition activities shall be acceptable for dumping-at-sea. Any inert waste that has been contaminated with other types of waste (e.g. the material currently deposited at landfills) cannot be considered suitable for dumping-at-sea, unless pre-treated and rendered completely inert.
- Municipal Solid Waste (MSW) and waste originating from industrial and commercial activities (other than inert waste) should be particularly excluded from the possibility of being dumped at sea.
- The only environmental impacts which will be tolerated are those caused by the physical effects of the dumped material. These physical effects include localised habitat change due to cover by dumped material.
- Dumping-at-sea should only be carried out in official dumpsites. The latter require development permission. The new EIA regulations demand an assessment of environmental impacts prior to the establishment of a new dumpsite or to the dumping of waste in an existing dumpsite.
  - Dumping-at-sea should not be considered in areas that are:
    - Legitimate uses;
    - fisheries grounds of economic significance;
    - breeding, nursery or feeding grounds for species of economic/ecological significance;
    - Marine Conservation Areas;
    - Bathing areas or upstream of bathing areas;
    - Areas containing meadows of the sea-grass *Posidonia oceanica*;
    - On or close to reefs;
    - In large shallow inlets and bays;
    - Important marine archaeological sites;
    - Other areas that have habitats that require the designation of Special Areas of Conservation as listed in Annex 1 of the Habitats Directive 92/43/EEC.
  - No dumping shall occur in sensitive coastal areas or in areas where material is likely to be carried towards sensitive sites along the shore.
- Dumping grounds shall require the preparation of an environmental monitoring programme, the designation of a buffer zone around the dumpsite, and the establishment of control sites in the vicinity.

- The dumping of inert waste at sea is to be done in accordance with all international, regional and national obligations within the Dumping Protocol under the Barcelona Convention and the London Dumping Protocol, after obtaining clearance from the bodies representing the respective instruments locally. Since impacts are minimised by the careful selection of dumpsites, the selection of dumpsites should take into account the provisions required under the above -mentioned protocols.
- Since the dumping of waste at sea constitutes a significant wastage of resources, whenever possible dumping-at-sea should be carried out in a way that makes use of the dumped material (e.g. creation of artificial reefs). This would be subject of the suitability (physical, geo-chemical properties, etc.) of the waste material for such purposes.
- The assessment of any proposals for dumping waste at sea should include an extensive assessment of the impacts that would arise from vehicles transferring waste to the transportation vessels and also from the construction of transfer facilities on quays.