

9.1 INTRODUCTION

Two ecological assessments of the project area have been undertaken. The first assessment was undertaken in Spring 2002 as part of an ecological assessment of six potential locations for the landfill facility. The second assessment was undertaken in October 2004. Both assessments were undertaken by Eman Calleja BSc, DSPU (Env. Rest.), MSc (Env. Mangt.). This section of the environmental statement describes the findings of these assessments and considers the impacts of the proposed development on the ecology of the development site and its surroundings.

The aim of this ecological study is to determine the impact on the environment of having an engineered landfill and waste management facility at L-Ghallis Ta' Gewwa, Naxxar. The assessment includes: an ecological description of the site including the habitats present; land use on and around the proposed site (within 300m), especially relating to natural sites; a detailed list of species growing on the site with emphasis on rare and protected species; a list legislation and policies which will be affected by the development, and expected impacts of situating the landfill on each of these sites.

9.2 TERMS OF REFERENCE

The Terms of Reference issued by MEPA require the following:

Section 2: Planning, Policies and Legislation

2.1 The relevance of Maltese legislation and Maltese planning policy notably "The Structure Plan for the Maltese Islands"; ... should be described and analysed. In particular, policies on the following should be noted: ... conservation areas and zones, afforested sites, nature reserves (existing and proposed), ... areas of natural beauty, areas of scientific, ecological,

Section 4: Description of the Site and its Surroundings

*4.1 Ecology - A full environmental description must be provided to **include** edaphic constraints, current land use and potential for development. Details of all trees, wooded areas, valleys and other landscape and habitat features to be removed, retained, enhanced or supplemented and measures for their protection must be described with an emphasis on any protected areas and any endangered, rare or unique species known to be found in the locality. The study must also be multi-seasonal to ensure adequate assessment of the different habitat types/species present on site during different times of the year.*

Section 5: Assessment of Environmental Impacts and Risks of the Proposed Development

*All significant impacts of and risks posed by the proposed project, **both during construction and during operation**, should be assessed, given the environmental characteristics of the site A descriptive and quantitative analysis (including magnitudes and timing) of the impacts of the proposed development should be made, and presented in summary chart format. ... It is recommended that impact assessment should include:*

- i. *description of impact; duration (temporary and permanent);reversible or irreversible effects of the impact ...*

Worse case scenarios should be assessed. The impacts may include:

5.1 Effects on ecology. Including loss of, damage to and alteration of habitats (including structures such as rubble walls) and species.

Section 6: Design of Mitigation Measures

This should include a description of the measures envisaged to prevent, minimise and where possible offset any significant adverse effects on the environment of the project ...

Section 8: Monitoring

The consultants must propose a monitoring program which should take into account monitoring of those features that are considered to be impacted negatively or the impact on which is uncertain. The program must be proposed at different stages: before, during and after construction. Details regarding type of and frequency of monitoring must also be given.

.....

9.3 METHODOLOGY

The first study was carried out in 2002. A copy of those parts of the study relevant to the Ghallis site is included as Appendix 9/1. The results of this study were very similar to the findings of the detailed study undertaken in 2004 which is described below

The study was carried out in October 2004. The vegetation within the area was assessed, with the help of Mr Timothy Tabone, by applying qualitative methods to study the types of habitats and species found in the area. Special attention was also given to any areas around the site that could be directly affected by the development of the engineered landfill, and in particular, any protected sites and rare or endangered habitats within 1km from the site itself.

Legend

RDB	Red Data Book for the Maltese Islands
LCV	Localities for Conservation Value
AEIs	Areas of Ecological Importance
SSIs	Sites of Scientific Importance
SACs	Special Area of Conservation

9.4 BASELINE SURVEY RESULTS

9.4.1 Ecological Description of the Site

The study site exhibits a variety of different habitats ranging from dumped up areas, to a rare rosemary garigue. Agricultural land was the most common habitat, with steppe and garigue being the next most common. A number of trapping sites and Eucalyptus plantations were also encountered. The habitats are identified on Drawing GH 9/1.

9.4.2 Agricultural Land

Most of the area on and around the proposed site consists of dry agricultural land (*Raba baghli*). Most of the crop consisted of cereals and various grasses for fodder. However there was evidence that in the past fruit trees were grown here. Remnants of these were mainly found along the field edges, underneath some high rubble walls. Some of the species found included a Lemon tree (*Citrus limon*), Black Mulberry (*Morus nigra*) and Pomegranate (*Punica granatum*). A few wells were also encountered scattered throughout the area.

Most of the plant species found were typical of disturbed areas. Due to regular tilling most of the species consisted of annuals, and the few perennials were found along the field borders.

Family	Species	Vernacular name	Status in RDB
Asteraceae	<i>Glebionis coronarium</i>	Crown Daisy	none
Boraginaceae	<i>Borago officinalis</i>	Borage	none
Brassicaceae	<i>Diplotaxis tenuifolia</i>	Perennial Wall-rocket	none
Euphorbiaceae	<i>Euphorbia pinea</i>	Pine Spurge	none
Fabaceae	<i>Lotus edulis</i>	Edible Birdsfoot Trefoil	none
Fabaceae	<i>Medicago polymorpha</i>	Toothed Medick	none
Geraniaceae	<i>Erodium malacoides</i>	Glandular Storksbill	none
Hypericaceae	<i>Hypericum triquetrifolium</i>	Bird's foot Trefoil	none
Malvaceae	<i>Lavatera cretica</i>	Cretan Mallow	none
Oxalidaceae	<i>Oxalis pes-caprae</i>	Cape Sorrel	none
Urticaceae	<i>Parietaria diffusa</i>	Pellitory-of-the-wall	none

9.4.3 Steppe and Carob/Lentisk Maquis

Not all the fields were used; a few parcels of land were left fallow. These were recolonised by steppic plants and a few shrubs such as the carob (*Ceratonia siliqua*) and Lentisk (*Pistacia lentiscus*). The size of these trees showed that they had been abandoned a long time ago, and they were used for grazing purposes. In fact the dominant species here were plants typical of overgrazed areas. A considerable part of the steppe was found on rocky ground that once used to be garigue.

Species that show evidence of such previous activities are:

- In the case of overgrazing only, patches with;

Family	Species	Vernacular name	Status in RDB
Anacardiaceae	<i>Pistacia lentiscus</i>	Lentisk	none
Caprifoliaceae	<i>Lonicera implexa</i>	Evergreen Honeysuckle	none
Fabaceae	<i>Ceratonia siliqua</i>	Carob	none
Lamiaceae	<i>Micromeria microphylla</i>	Maltese Savoury	none
Lamiaceae	<i>Prasium majus</i>	White Hedge-nettle	none

The above species are highly unpalatable or poisonous species, and are usually the last to go on an overgrazed site. In the case of the Carob, it has a strong regeneration capacity. In places where grazing is still present, the trees were shaped like an umbrella, with the lower branches completely cut off from the ground (since they were cropped by the grazing animals)

- In places where overgrazing was accompanied by fire;

Family	Species	Vernacular name	Status in RDB
Asparagaceae	<i>Asparagus aphyllus</i>	Spiny Asparagus	none
Liliaceae	<i>Asphodelus aestivus</i>	Branched Asphodel	none
Liliaceae	<i>Urginea pancration</i>	Sea squill	Rest (MED)
Poaceae	<i>Hyparrhenia hirta</i>	Hispid Beard-Grass	none

This last community was very common in many places, and there is evidence that grazing is still taking place today. There were tufts of *Hyparrhenia hirta* that have been completely nibbled, and some places were entirely dominated by *Asphodel*.

9.4.4 Xaghret Frankin

This is the largest expanse of garigue found on the site. However it was so degraded that it could neither be considered as a garigue, and you would even have difficulty calling it a steppe. It wasn't only overgrazed, shown by evidence of cropped *Hyparrhenia hirta* stumps, but also situated just underneath the landfill. Most of the vegetation consisted of species typical of highly disturbed habitats. The only feature of interest was a few rock pools located close to the landfill. These were nevertheless quite degraded and filling with rusting pots and pans and other rubbish. The following species were encountered:

Family	Species	Vernacular name	Status in RDB
Juncaceae	<i>Juncus hybridus</i>	Rush	none
Lamiaceae	<i>Mentha pulegium</i>	Pennyroyal	none
Lythraceae	<i>Lythrum hyssopifolia</i>	Hyssop Loosestrife	none
Zanichelliaceae	<i>Zanichellia cf. palustris</i>	Horned Pondweed	rare

9.4.5 Wild Thyme Garigue

The best stretch of thyme garigue was found in a piece of land between Habel Zwejra and l-Ghallis ta' Barra. Nevertheless, the habitat consisted more of a steppe than a garigue. A large part of this garigue is located within the development boundary. Several trapping sites were located on the garigue, and the landraise of Maghtab was spilling onto the area in many places. Nevertheless large populations of thyme were found growing in this section. Other species found growing on this garigue were:

Family	Species	Vernacular name	Status in RDB
Apiaceae	<i>Ferula communis</i>	Giant Fennel	none
Asteraceae	<i>Carlina involucrata</i>	Clustered Carlina-Thistle	none
Asteraceae	<i>Dittrichia viscosa</i>	Sticky Fleabane	none
Asteraceae	<i>Senecio bicolor</i>	Silvery Ragwort	none
Liliaceae	<i>Asphodelus aestivus</i>	Branched asphodel	none
Poaceae	<i>Lagurus ovatus</i>	Hare's-tail Grass	none

9.4.6 Rosemary Garigue

This was probably the most noteworthy habitat found on the entire site. Rosemary (*Rosmarinus officinalis*) (Status in RDB – **Rare, Rest MI**) is considered as rare in the Maltese islands, and of having a restricted distribution. Here however it is quite frequent and was encountered in at least four different places throughout the site. It forms garigues dominated by itself, with the Evergreen honeysuckle (*Lonicera implexa*), Thyme (*Thymbra capitata*), Spiny asparagus (*Asparagus aphyllus*) and Carob (*Ceratonia siliqua*) being subdominant. In the Red Data Book for the Maltese Islands it is described as forming maquis, however here it was quite low, not exceeding more than half a metre in height.

Only one area of rosemary garigue was located within the area to be developed as part of the current scheme.

9.4.7 Trapping Sites and Eucalyptus Plantations

Apart from agriculture and grazing, this was the third most common land use on the site. The practice is quite environmentally damaging since the land is cleared from its vegetation and pesticides are used as well. Few plants survive, and the area immediately surrounding the trapping site is usually an impoverished steppe. Plants found here were typical of disturbed areas, due to the human disturbance present either through the trapping practices and weeding or trampling. The eucalyptus plantations were also quite degraded. Most of them were still young, such that a layer of leaf litter had not yet accumulated on the soil. It is this leaf litter in fact which does most damage since it emits toxins that inhibit plant growth underneath the trees.

Examples of plants found in this habitat were:

Family	Species	Vernacular name	Status in RDB
Asparagaceae	<i>Asparagus aphyllus</i>	Spiny Asparagus	none
Asteraceae	<i>Cichorium spinosum</i>	Spiny Chicory	none
Liliaceae	<i>Asphodelus aestivus</i>	Branched Asphodel	none
Plantaginaceae	<i>Plantago lagopus</i>	Hare's-foot Plantain	none

9.4.8 Protected Trees and Shrubs Found on Site

Seven different protected species were found on the site, the most common being the carob, *Ceratonia siliqua*. There were so many that it was difficult to mark them systematically on a map. Specimens ranged from large trees to shrubs found in crevices in the garigue. An estimation of at least over a hundred trees were found throughout the study site, most of them being carobs. The lentisk was the next most common species.

9.5 LAND USE WITHIN A 300m RADIUS

Three different scenarios surround the site. To the east, it is flanked by the already existing landfill. To the south it is bordered by dry agricultural land, similar in land use to the one met on the site, while to the North and Northeast, it is surrounded by degraded garigue and steppe. The most noteworthy habitat from the three is the degraded garigue to the North.

On investigating the garigue, it was found that in most areas the garigue is extremely degraded. The predominant type of vegetation consisted of a mixture of grasses, the dominant ones being *Stipa capensis* (Mediterranean steppe grass) and *Hyparrhenia hirta* (Hispid beard grass). Where garigue shrubs were more prominent, *Thymbra capitata* (Mediterranean thyme) and *Micromeria microphylla* (Maltese savoury) were the dominant species.

In several places, patches of the garigue had been converted to trapping sites. The vegetation was cleared and the soil was levelled off to make place for nets. Other trapping sites were observed which were once used in the past, and were now recolonised by vegetation. The vegetation here was denser, however, it consisted almost entirely of steppic grassland. *Stipa*

capensis was dominant in the trapping sites that were recently abandoned, while *Hyparrhenia hirta* dominated sites that had been abandoned for a longer period. Other species found on the site included:

Family	Species	Vernacular name	Status in RDB
Asteraceae	<i>Galactites tomentosa</i>	Boar Thistle	none
Apiaceae	<i>Daucus carota</i>	Wild Carrot	none
Euphorbiaceae	<i>Euphorbia pinea</i>	Pine Spurge	none
Liliaceae	<i>Urginea pancration</i>	Sea Squill	Rest (MED)
Poaceae	<i>Stipa capensis</i>	Mediterranean Steppe-grass	none

Another stretch of rosemary garigue was also found at the north-eastern tip of the garigue, just outside the proposed site. This was just underneath the edge of the debris overflowing from the landfill. The rosemary here was more degraded than those found within the site.

According to the publication Localities of Conservation Value in the Maltese Islands, the area around Ghallis and Maghtab seems to be quite an ecologically rich area. Ghallis is the type locality and the only site known for the endemic isopod *Miktoniscus melitensis* (Status in RDB – Endemic, Very rare, Rest MI). This site is also a “particularly good locality” for many orthopterans including tettigoniid grasshoppers of the genus *Platycleis*, the acridid grasshoppers *Oedaleus decorus* and *Pyrgomorpha conica*, and the mantid *Rivetina baetica*.

The most important site within 300m from the edge of the proposed landfill is Ghadira s-Safra. This wetland is protected by two different government notices, and is declared as a Special Area of Conservation of International Importance (more information is given in the section Legislation).

9.6 LIST OF SPECIES

9.6.1 Flora

A detailed list of species found growing in the site proposed was prepared (see appendix 9/2). Most of the species found are species typical of disturbed habitats: e.g. *Glebionis coronarium*, *Daucus carota*, *Sonchus oleraceus*, *Erodium malacoides*, *Carlina corymbosa*, *Oxalis pes-caprae*, *Reichardia picroides* and *Dittrichia viscosa*. Apart from these, there were also six species of fruit trees; Fig tree (*Ficus carica*), Almond tree (*Amygdalus communis*), Black mulberry (*Morus nigra*), Lemon tree (*Citrus limon*), Prickly Pear (*Opuntia ficus-indica*) and Pomegranate (*Punica granatum*). A few other trees planted for hunting purposes were also found; Blue-leaved wattle (*Acacia saligna*) Aleppo pine (*Pinus halepensis*) and Red Gum (*Eucalyptus camaldulensis*). Finally, two species used for landscaping by the local landowners, were also used; Tree House-leek (*Aeonium arboreum*) and Cypress (*Cupressus sempervirens*).

Two rare species growing on the site were encountered. These consisted of the Horned Pondweed (*Zanichellia cf. palustris*) and Rosemary (*Rosmarinus officinalis*). In the case of the Horned pondweed it is more vulnerable since it is found just underneath the present landfill, and the rock pools were quite degraded. With the rosemary however the situation was a bit better since the garigue where it was found was further away from the landfill, and

was more intact. In some places there were huge bushes of about 3m in diameter, and in one particular garigue, it was completely dominated by rosemary shrubs.

Two of the species encountered are declared as alien invasive species under Schedule V of the Tree and Woodlands (Protection) Regulations:

- *Acacia saligna* (Blue-leaved Wattle), declared as an Invasive or Damaging species for the environment under the Tree and Woodlands Protection Regulations (2001) in schedule 5.
- *Ricinus communis* (Castor Oil Tree), declared as an Invasive or Damaging species for the environment under the Tree and Woodlands Protection Regulations (2001) in schedule 5.

9.6.2 Fauna

Although the study covered only the floristic aspect, evidence of wildlife was found everywhere throughout the site, particularly by the presence of reptiles. Apart from the Maltese wall lizard, no other species were encountered, however due to the large area covered by the site, and the variety of habitats present, it is not discounted that other species might be present. In the Legislative section, a list of species which could possibly be found on the site is given.

9.7 LEGISLATION, POLICIES AND GUIDANCE

9.7.1 Local Legislation

Environmental legislation of relevance to the development site is mainly that protecting features, habitats or species found within the site or immediately surrounding it. Below is a list of legislation that will be affected by the project:

1. Flora, Fauna and Natural Habitats Protection Regulations (L.N. 257 of 2003, issued under the Environment Protection Act, 2001),
2. Trees and Woodland (Protection) Regulations (L.N. 12 of 2001),
3. Conifer Trees (Preservation) Regulations (G.N. 328 of 1949 issued under the Code of Police Laws),
4. Reptiles (Protection) Regulations (L.N. 76 of 1992),
5. Fertile Soil (Preservation) Act (Act XXIX of 1973 and L.N. 104 of 1973 – Preservation of Fertile Soils Regulations),
6. Rubble Walls and Rural Structures (Conservation and Maintenance) Regulations (L.N. 160 of 1997)
7. Wild Thyme (Protection) Regulations (G.N. 85 of 1932)

Flora, Fauna and Natural Habitats Protection Regulations (L.N. 257 of 2003)

This regulation transposes Directive 92/43/EEC, better known as “The Habitats Directive”. This Regulation contains a series of schedules that protect various species and habitats. Schedule I lists *Natural Habitat types whose conservation requires the designation of Special Areas of Conservation*. Schedule II lists *Animal and Plant species of interest whose conservation requires the designation of special areas of conservation*. Schedule IV lists *Protected Flora*. Schedule V lists *Protected Fauna*. Schedule VI lists *Animal and Plant Species of National Importance ... whose taking in the wild and exploitation may be subject to management measures*.

The site being developed has no habitats listed in Schedule I. However due to the large surface area being developed, it may harbour one species found in Schedule IIa - The Leopard Snake (*Elaphe situla*). Two plant species listed in Schedule IIb are also found on the site; *Thymra capitata* and *Zannichelia melitensis*. One protected species listed on Schedule IV was also found on the site; *Zannichelia melitensis*.

Although not encountered directly, the type of existing habitat also allows for the possible presence of a number of species listed in Schedule V, including the Ocellated Skink (*Chalcides ocellatus*), Chameleon (*Chamaeleo chamaeleon*), Algerian Whip Snake (*Coluber algirus*), Western Whip Snake (*Coluber viridiflavus*), Leopard Snake (*Elaphe situla*), Turkish Gecko (*Hemodactylus turcicus*), Maltese Wall Lizard (*Podarcis filfolensis maltensis*), Moorish Gecko (*Tarentola mauritanica*), Cat snake (*telescopus fallax*), Weasel (*Mustela nivalis*), Algerian Hedgehog (*Atelerix algirus*) and Pygmy White-Toothed Shrew (*Suncus etruscus*).

Seven species listed in Schedule VI were also encountered on the site; the Caper Bush (*Capparis orientalis*), Rosemary (*Rosmarinus officinalis*), Maltese Savory (*Satureja microphylla*), Large Star-of-Bethlehem (*Ornithogallum arabicum*), Southern Star-of-Bethlehem (*Ornithogallum narbonense*) French Daffodil (*Narcissus tazetta*) and Maltese Seaside Squill (*Urginea pancration*).

Nevertheless the necessary permits should be obtained for the removal or loss of these species prior to the commencement of development, from the Competent Authority as outlined in Part X of L.N. 257 of 2003.

Tree and Woodland (Protection) Regulations

Seven species protected under this regulation were encountered on the site;

- *Cupressus sempervirens* (Cypress), listed in schedule 1B.
- *Pinus halepensis* (Aleppo pine), listed in schedule 1B.
- *Pistacia lentiscus* (Lentisk), listed in schedule 1B.
- *Ceratonia siliqua* (Carob), listed in schedule 2.
- *Olea europaea* (Olive), listed in schedule 2.
- *Punica granatum* (Pomegranate), listed in schedule 2.
- *Morus nigra* (Black mulberry), listed in schedule 2.

The relevant permits to remove these trees need to be obtained prior to the commencement of the development from the Environment Directorate within MEPA, after consultation with the Department of Agriculture.

Conifer Trees (Preservation) Regulations

According to this Government Notice, *it is unlawful to destroy, cut down or uproot conifer trees (Cupressus sempervirens or Pinus spp.) without the written permission of the Director of Agriculture.* Both of these species are found in this site, therefore the necessary permits need to be obtained for these trees before commencement of works.

Reptiles (Protection) Regulations

As stated earlier, since this site covers a considerably large area of land, it is highly probable that several species of protected reptiles will be affected.

Fertile Soil (Preservation) Act

This Act requires that, before undertaking excavations, the Director of Agriculture must be informed to ensure that the soil is removed and is deposited in a manner approved by the Director. The procedures for applying for written permission for soil removal, transport and deposit are outlined in the Preservation of Fertile Soils Regulations (L.N.104 of 1973).

Rubble Walls and Rural Structures Regulations

These regulations protect all rubble walls and non-habitable rural structures *in view of their historical and architectural importance, their exceptional beauty, their affording a habitat for flora and fauna, and their vital importance in the conservation of the soil and water.*

Wild Thyme (Protection) Regulations

This Government Notice forbids the collection and exploitation of wild thyme (*Thymbra capitata*), and requires that such exploitation can only be allowed after written permission is obtained from the Director of Agriculture. Since this species is common throughout the site, the necessary permits should be obtained from the Department of Agriculture prior to the commencement of any works on the site.

9.8 PROTECTED SITES WITHIN 1KM OF THE SITE BEING DEVELOPED

Although there are no protected sites within the site proposed for development, there are a handful of protected sites that lie within 1km from the boundaries of the proposed landfill. Below is a list of legislation under which these sites are protected;

- G.N. 87 of 2003 (Special Areas of Conservation – part of L.N. 257 of 2003),
- G.N. 288 of 1995, G.N. 402 of 1996 and G.N. 827 of 2002 (Areas of Ecological Importance or Sites of Scientific Importance – part of Development Planning Act, 1992),
- L.N. 41 of 2003 (Legal Notice declaring Bird Sanctuaries).

Ghadira s-Safra

This is the closest and possibly most vulnerable protected site in vicinity of the landfill. It lies less than 200m north east of the edge of proposed waste facility. This coastal freshwater pool between Ghallis and Qalet Marku is a unique habitat which supports numerous very rare animals including the Tadpole Shrimp (*Triops cancriformis*) (Status in RDB – Rare, Rest MI), and Prickle Grass (*Crypsis aculeata*)(Status in RDB – Endangered, Rest MI).

Below are the two Government Notices that protect this site as a Special Area of Conservation of International Importance, an Area of Ecological Importance, and a Site of Scientific Importance, and the reasons for which it was protected;

- G.N. 877 of 2003 – Special Area of Conservation, International Importance
 - *A unique wetland supporting numerous very rare and protected flora and fauna, including Riella helicophylla, a liverwort of European importance confined to this locality in the Maltese Islands,*
- G.N. 288 of 1995 – AEI/SSI - Freshwater wetland at Ghallis
 - Article 10. *Freshwater wetland at 1-Ghadira s-Safra, Ghallis (L/0 Naxxar) designated as a level 1 area of ecological importance and a level 1 site of*

scientific importance in terms of Structure Plan Policy RCO 12 and Clauses 15.34-15.39 of the Plan's Explanatory Memorandum.

Qalet Marku

The next closest site is Qalet Marku, a Saline Marshland lying 600m east of the proposed landfill. It is protected under one Government Notice;

- G.N. 288 of 1995 – AEI/SSI – Saline Marshland
 - Article 7. *Salina marshland at Qalet Marku (l/o Naxxar) designated as a level 1 area of ecological importance and a level 2 site of scientific importance in terms of Structure Plan Policy RCO 12 and Clauses 15.34-15.39 of the Plan's Explanatory Memorandum.*

Is-Salini

Is-Salini is one of the most important natural sites in Malta. It lies just under 800m from the proposed facility. It is declared as a Natura 2000 site and also as a Bird Sanctuary. Below is the legislation under which it is protected;

- GN877 of 2003 – Special Area of Conservation, International Importance
 - *The largest of the remaining coastal marshes of the Maltese Islands, home to an array of rare habitats and species, including habitats based on rushes, tamarisk groves and a small population of the Maltese Killifish,*
- GN 402 of 1996 – AEI/SSI – Saline Marshland
 - Article 8. *Saline Marshland, Garigue, Grove and Rocky Steppe (as per site plan) at is-Salini, limits of St Paul's Bay and Naxxar, designated as an Area of Ecological Importance and a Site of Scientific Importance in terms of Structure Plan Policies RCO 10, 11 and 12 and Clauses 15.34—15.40 of the Plan's Explanatory Memorandum,*
- LN 41 of 2003 – Bird Sanctuary
 - Schedule V, sub article 2 – *The surroundings of Kennedy grove and Salina.*

Il-Gebla tal-Ghallis

The last site is a small island just north of l-Ghadira s-Safra. It is declared as a Site of Scientific Importance as follows;

- GN 827/02 – SSI
 - *Ghallis rocks, limits of Naxxar, as a Level 2 Site of Scientific Importance (Geomorphology).*

9.9 LOCAL PLANS

The Central Malta Local Plan

This policy guidelines discusses the possible choice of l-Ghallis ta' Gewwa as a site for a landfill according to Policy NA19, and article 13.1.44 which states: *The Plan will thus follow the recommendations suggested ... including proposals for a possible engineered sanitary landfill site at Ghallis, and a civic amenity site for separated waste collection. Government is considering a number of alternative sites ... one of which is at Ghallis ta' Gewwa. In this*

respect until such a site selection process is concluded by Government, this area of land is being reserved. (MEPA, 2002)

9.10 INTERNATIONAL CONVENTIONS

The Bern Convention

This convention, otherwise known as the *Convention on the Conservation of European Wildlife and Natural Habitats*, includes a number of Appendices listing a number of protected species in Europe. Of particular importance to Malta is the Maltese Wall Lizard (*Podarcis filfolensis maltensis*), in Appendix II, and the Turkish Gecko (*Hemidactylus turcicus*) and Moorish Gecko (*Tarentola mauritanica*), in Appendix III. Whereas the first species was encountered on the site, the presence of the other two could not be discounted due to the abundance of suitable habitats for these two species on the project area.

9.11 EVALUATION OF ECOLOGICAL RESOURCE

The site has been long modified by man as a result of his agricultural practices and of recent activities linked with trapping and dumping. Although large extents of agricultural land have been abandoned and grazing has decreased drastically over the last half a century, the development site can still be considered as a derelict and disturbed area in ecological terms. Nevertheless small pockets of ecologically sensitive habitats could be found throughout the site, in particular the rock pools to the north and the rosemary garigue dispersed throughout the area.

Although there were no protected sites within the Application Site, there are a number of species protected under various legislative tools. 9 protected species of plants were encountered within the site. An even larger number of protected animals could possibly be found within the site at one time or another. However, since the habitats of these species are widespread throughout the Maltese Islands, most of them are consequently frequent in the Maltese countryside.

The site does not have any habitats listed in schedule one of L.N. 257 of 2003, which would qualify it as a candidate for a Special Area of Conservation. Nevertheless there are two plant species listed in Schedule IIB that were present on the site (See legislative tools). Even though one of them was frequent in the site, the other was localised, and the habitat in which both are found are considerably degraded, and thus do not warrant it protection as an SAC.

Although the Application Site lies within 1km of 4 different protected sites, most of these are outside the area of influence of the proposed landfill. One of them however lies less than 200m from the edge of the site, Ghadira s-Safra. The other, il-Gebli ta' l-Ghallis is an island with no vegetation on it (it is scheduled for its Geomorphology), therefore its integrity will not be affected by the landfill. Nevertheless if effluent from the proposed landfill is allowed to reach the aquifer, toxic element from the site might reach the 3 protected wetlands around the site, and have a negative influence on the fauna growing there. What one must keep in mind however, is that this area was already being used as an open landraise without any precautionary measures to prevent the toxic effluents from reaching the aquifer. Thus to some extent, these sites could already be feeling the effect of the presence of the landraise in the vicinity.

9.12 ASSESSMENT OF IMPACTS

9.12.1 Impacts During Excavation

Potential Impacts

- Habitat loss
 - Destruction of habitats due to site excavation
 - Complete removal of vegetation and soil will result in the loss of several species of flora and fauna,
 - Loss of 9 protected species of trees and other plants,
 - Potential loss of protected wildlife,
 - Loss of rare Rosemary garigue. Being a rare habitat, its importance lies in the habitat it creates and not in the loss of the single species. Transplanting the species to another site would not be enough, since it is the entire plant community that will be lost. The reduced landtake now proposed will only result in the loss of one area of rosemary garigue.
 - Possible loss of rare and endemic species, one in particular is the very rare and endemic isopod, *Miktoniscus melitensis* (**Status in RDB – Endemic, Very rare, Rest MI**). If this isopod in particular is found to exist on the exact site being proposed for development, its loss could deal a great blow to the survival of this species,
 - Loss of Carob/Lentisk maquis, transplantation could be an option, but most will be lost since both species do not fare transplantation well,
 - Loss of habitats of minor importance, such as Xaghret Frankin and Eucalyptus and trapping sites,
 - Loss of rubble walls and the habitats they create. This would most probably result in the loss of several reptiles,
- Disturbance or damage to habitats and/or wildlife
 - Damage done to soil during excavation and translocation. This disturbance will affect the soil organic content and biotic activity in the soil,
 - Effects of trampling of machinery on habitats immediately surrounding the development site,
 - Effects of dust deposition on surrounding land during construction,
 - Accidental damage to habitats immediately surrounding the development site,
- Effect on neighbouring protected sites,
 - Dust deposition, on neighbouring protected sites, in particular on l-Ghadira s-Safra. Deposition of dust here might change the pH in the water and affect the freshwater fauna. The vegetation around the pool might also be affected by dust deposition.
 - Runoff during excavation. Although runoff from the site itself will be negligible, since the site will be excavated, it will be higher in the surrounding areas. Dust deposited on the surrounding garigue will be carried away during every downpour, and find its way down slope and into the sea. This might affect the visibility and nutrient content of the sea just off the coast at L-Iskoll tal-Ghallis.

Significance

- Habitat loss
 - Much of the habitats present on the Development Site are already degraded and their loss will not be of major impact to the ecological stability of the region, let alone the rest of the country.
 - Loss of protected species, although significant since there are at least over 100 protected trees found on the site, does not include the loss of rare or endangered species, except for the Horned Pond Weed. 8 out of the 9 protected species are considered as common.
 - The potential loss of protected wildlife, again will be significant only for this area, and not when compared to the rest of the country. Most of the protected species mentioned in the Legislative section are considered as common or frequent, and their loss will not threaten the survival of these species in the rest of the island.
 - The remaining populations of rosemary at Ghallis constitute the remnants of a much larger previous distribution (Tabone T., Personal communication). The reduced landtake of the scheme would result in only one of four areas of rosemary within the original development site being lost. Loss of possible rare and endemic species found on the site could be very significant, particularly if a considerable proportion of the rare species is found living on the Development Site. A study should be made to identify the location of this rare species.
 - The expected ecological impact of the loss of garigue at Xaghret Frankin will be limited since this site is already very badly degraded. The only species of particular concern is the Horned Pondweed; however the rock pools in which it was found were so degraded that its survival there was quite limited.
 - The ecological consequences of the loss of agricultural land will be much less felt since this was found to support plants typical of disturbed areas.
- Disturbance or damage to habitats and/or wildlife
 - For soil translocation, the necessary permits and clearance from the Department of Agriculture needs to be obtained before commencement of excavation.
 - Trampling of machinery outside the zone of excavation should be kept to a minimum since this would extend the impact further from the Development Site.
 - Dust deposition on the surrounding garigue will reduce the photosynthetic capacity of plants, leading to a reduction in plant growth. The neighbouring garigue however are already degraded due to the existence of the Maghtab landraise.
 - Accidental damage to habitats outside zone of development should not be of major concern if the necessary precautions are taken to abate spill over of machinery beyond the Development Site.
- Effect on neighbouring protected sites,
 - The most at risk protected site to be affected by this environmental disturbance is the freshwater pool at Ghadira s-Safra. The only factor that might limit the

damage done by deposition of dust is the fact that the prevailing wind will blow in the opposite direction from the landfill, away from Ghadira s-Safra.

9.12.2 Impacts During Operation

Potential Impacts

- Runoff from the landfill. Any runoff from landfill may find its way to l-Ghadira s-Safra or Qalet Marku wetlands. Surface water management proposals have been included to manage surface water within the site.
- Seepage of effluent through the rocks to the water table. Any toxic chemicals might end up reaching one of the 3 protected wetlands in the surroundings by finding their way to the aquifer. A composite lining system is proposed for the site designed on the basis of a risk assessment.
- Reduction of amount of water reaching water table of area. According to the design details, runoff from the site will be managed within the site and recharged into the aquifer through soakaways.

Significance of Impacts

- Other ecological impacts during operation of the landfill will be limited since the area is already under the influence of the landraise at Maghtab, and the new engineered landfill will should have a lesser environmental impact than the present one at Maghtab, since it is being built in line with the Landfills Directive. Release of effluents and runoff laden with toxic materials will be eliminated from this landfill. So therefore, the situation on the surrounding will not be much worse than it currently is with respect to dust emissions, odour and toxicity levels. A greater impact will be done during development of the landfill itself, than during its operation.
- Nevertheless care has to be taken to maintain fresh water levels in the aquifer that make its way to Ghadira is-Safra. Surface water falling on the completed parts of the landfill will be directed to soakaways which will maintain the current infiltration of surface water into the site.

9.12.3 Impacts after Termination

- Care should be taken during development of the landfill such that eventual leakage of toxic chemicals through the impermeable layers of the landfill will be avoided. Its construction should be done according to the Landfill Directive, and all measures should be taken to avoid runoff from the site.
- Restoration of the landfill should be done preferably as suggested in the Project Description prepared by the MRAE, i.e. at an early stage starting when the first part of the fill reaches the maximum level.
- Landscaping should also be done using native trees, and preferably in a way which would give a natural look to the landscape, and not in rows, making it look like an artificial site for eternity.

9.13 MITIGATION

- All the necessary permits, as outlined in the legislative section, should be obtained from the appropriate entities before commencement of excavations.

- Protected tree species that are lost during excavation should be replaced according to Schedule I of the Guidelines on Trees, Shrubs and Plants for Planting and Landscaping in the Maltese Islands.
- In the case of the wild thyme, the Department of Agriculture should be contacted prior to commencement of excavation in order to collect and save as much plantlets of wild thyme and rosemary as possible from the affected site.
- Trampling of heavy machinery and spill over of the impact beyond the excavated site should be kept to a minimum.
- Runoff and leakage of effluent from the site should be avoided to reduce the impact of these toxic chemicals on the neighbouring protected sites.

9.14 MONITORING

A study should be made to determine whether *Miktoniscus melitensis* (**Status in RDB – Endemic, Very rare, Rest MI**) is present on the site. The study should start before the commencement of excavations to determine populations of this invertebrate. The surrounding areas should also be surveyed for a distance of 200m away from the site. Monitoring will also continue during the excavation phase, and samples should be taken at random from the soil to determine whether it is present on soil. The study will pursue during the operation phase, by which time, enough information would have been obtained on the biology, and ecology of this invertebrate.

Monitoring should also be done on the freshwater levels and associated ecologies of l-Ghadira s-Safra. This should be done before the excavations start. Measurements of the salinity and water content of the soil should be made by studying their values as you move away from the core of the freshwater pool. The same studies should also cover the faunal and floral populations of the wetland. The studies will continue once the excavations start, and go on for ten years to determine if the watershed has been affected by the landfill.

APPENDIX 9/1

NOTE: Relevant extracts from 2002 ecological survey of Ghallis site – note that the 2002 survey area included the development site and additional land to the west.

INTRODUCTION

This comparison of the potential landfill sites, one of which is Ghallis, is based on the findings of an ecological survey of the six shortlisted sites produced by Eman Calleja in September 2002. The report includes an ecological description of the site and the surrounding area, including the habitats present; land use on and around the proposed site; a detailed species list, with emphasis on rare and protected species; and expected impacts from siting the landfill at each of the locations.

GHALLIS SITE

The habitats vary from agricultural land, to degraded steppe, garigue dominated by rosemary and finally trapping sites and Eucalyptus plantations. The ecological assessment notes that the Ghallis site is probably the most ecologically diverse site of the six shortlisted sites. The majority of the land in and around the proposed site consists of dry agricultural land. Most of the plant species in the agricultural land were typical of disturbed areas. Some of the fields had been abandoned or were disused, and had been recolonised by steppic plants and a few shrubs such as Carob and Lentisk. The areas were often overgrazed and were significantly degraded.

A large area of garigue was found in the area adjacent to the existing landfill. However it was so degraded that it could not be considered as garigue, or even possibly steppe. Rosemary garigue was the most noteworthy habitat found on the entire site. Rosemary is considered rare in the Maltese Islands and was encountered in at least four different places throughout the site.

Trapping sites and Eucalyptus plantations were the third most common land use on the site. The trapping areas are typically cleared of vegetation and the eucalyptus trees limit plant growth. Consequently the ecological value of these areas was limited.

The most noteworthy habitat surrounding the site is the garigue located to the north of the site. In most areas the garigue is extremely degraded, with vegetation stripped from parts of the area to allow trapping. According to the publication 'Localities of Conservation Value in the Maltese Islands' the area around Ghallis and Maghtab appears to be a relatively rich ecological area, although it not known how much of this value has been lost by the progressive extension of the existing landfill.

In terms of protected sites there is a coastal pool, known as Ghadira s-Safra, to the north of the existing landfill, that is a level 1 Area of Ecological Importance. There are also two proposed level 4 AEI's. One is the coastline north of the Ghallis site, and the second is the garigue located to the north of the site also covers land under the current landfill and includes the area of degraded garigue at the eastern boundary of the Ghallis site. It would appear that much of this proposed AEI has been lost by the encroachment of the landfill.

APPENDIX 9/2

List of Species

The species list was compiled by Mr Timothy Tabone. Below are the species encountered during the study. Their status as mentioned in the Red Data Book is also shown. Below is an explanation of the details given:

R → taxon is rare locally

Rest (MI) → taxon has a restricted distribution in the Maltese Islands

Rest (MED) → taxon has a restricted distribution in the Mediterranean region

Species under cultivation or planted by local farmers. The agricultural crops have their names listed in English or Maltese on the right hand side.

Class – Pinopsida

Family	Pinaceae <i>Pinus halepensis</i>
Family	Cupressaceae <i>Cupressus sempervirens</i>

Order – Dicotyledons

Family	Moraceae <i>Ficus carica</i> <i>Morus nigra</i>
Family	Urticaceae <i>Parietaria diffusa</i>
Family	Polygonaceae <i>Emex spinosa</i>
Family	Chenopodiaceae <i>Beta maritima</i> <i>Chenopodium album</i> <i>Chenopodium murale</i>
Family	Amaranthaceae <i>Amaranthus graecizans</i> <i>Amaranthus viridis</i>
Family	Caryophyllaceae <i>Silene colorata</i> <i>Silene nocturna</i> <i>Silene vulgaris</i>
Family	Ranunculaceae <i>Anemone coronaria</i> <i>Delphinium peregrinum</i> <i>Nigella damascena</i> <i>Ranunculus bullatus</i>
Family	Capparidaceae

	<i>Capparis orientalis</i>	
Family	Papaveraceae	
	<i>Papaver spp.</i>	
Family	Brassicaceae (=Cruciferae)	
	<i>Diplotaxis tenuifolia</i>	
	<i>Diplotaxis erucoides</i>	
	<i>Lobularia maritima</i>	
	<i>Sinapis alba</i>	
	<i>Sinapis arvensis</i>	
Family	Resedaceae	
	<i>Reseda alba</i>	
Family	Crassulaceae	
	<u><i>Aeonium arboreum</i></u>	
	<i>Sedum caeruleum</i>	Rest (MED)
Family	Rosaceae	
	<u><i>Amygdalus communis</i></u>	
	<i>Sanguisorba minor</i>	
Family	Fabaceae (=Leguminosae)	
	<u><i>Acacia saligna</i></u>	
	<i>Ceratonia siliqua</i>	
	<i>Hedysarum coronarium</i>	
	<i>Hippocrepis multisiliquosa</i>	
	<i>Lotus edulis</i>	
	<i>Lotus ornithopodoides</i>	
	<i>Medicago minima</i>	
	<i>Medicago polymorpha</i>	
	<i>Ononis viscosa</i> ssp. <i>sieberi</i>	
	<i>Scorpiurus muricatus</i>	
	<i>Tripodion tetraphyllum</i>	
Family	Oxalidaceae	
	<i>Oxalis pes-caprae</i>	
Family	Geraniaceae	
	<i>Erodium malacoides</i>	
	<i>erodium moschatum</i>	
Family	Linaceae	
	<i>Linum strictum</i>	
	<i>Linum triginum</i>	
Family	Euphorbiaceae	
	<i>Andrachne telephioides</i>	
	<i>Chrozophora tinctoria</i>	
	<i>Euphorbia helioscopia</i>	
	<i>Euphorbia peplus</i>	
	<i>Euphorbia pinea</i>	
	<i>Mercurialis annua</i>	
	<i>Ricinus communis</i>	
Family	Rutaceae	
	<u><i>Citrus limon</i></u>	
	<i>Ruta chalepensis</i>	
Family	Vitaceae	
	<u><i>Vitis vinifera</i></u>	

Family	Anacardiaceae <i>Pistacia lentiscus</i>	
Family	Malvaceae <i>Lavatera cretica</i>	
Family	Clusiaceae <i>Hypericum triquetrifolium</i>	
Family	Cistaceae <i>Fumana thymifolia</i>	
Family	Cucurbitaceae <i>Ecballium elaterium</i>	
Family	Cactaceae <u><i>Opuntia ficus-indica</i></u>	
Family	Punicaceae <u><i>Punica granatum</i></u>	
Family	Lythraceae <i>Lythrum hyssopifolia</i>	
Family	Myrtaceae <u><i>Eucalyptus camaldulensis</i></u>	
Family	Apiaceae (=Umbelliferae) <i>Ammi majus</i> <i>Daucus carota</i> <i>Ferula communis</i> <i>Foeniculum vulgare</i> <i>Pimpinella peregrina</i>	
Family	Primulaceae <i>Anagallis arvensis</i>	
Family	Oleaceae <i>Olea europea</i>	Rest (MI) ?
Family	Rubiaceae <i>Asperula cynanchia</i> <i>Rubia peregrina</i> <i>Valantia muralis</i>	
Family	Convolvulaceae <i>Convolvulus arvensis</i> <i>Convolvulus elegantissimus</i> <i>Cuscuta epithymum</i>	
Family	Boraginaceae <i>Borago officinalis</i> <i>Echium parviflorum</i> <i>Heliotropium europaeum</i>	
Family	Lamiaceae (=Labiatae) <i>Ajuga iva</i> <i>Mentha pulegium</i> <i>Prasium majus</i> <i>Rosmarinus officinalis</i> <i>Satureja microphylla</i> <i>Teucrium fruticans</i> <i>Thymra capitata</i>	R, Rest (MI) Rest (Med)
Family	Solanaceae <i>Hyoscyamus albus</i>	

Family	<i>Nicotiana glauca</i>	
	Scrophulariaceae	
	<i>Anthirrinum tortuosum</i>	
	<i>Bellardia trixago</i>	
	<i>Kickxia spuria</i> ssp. <i>integrifolia</i>	
Family	<i>Misopates orontium</i>	
	Orobanchaceae	
	<i>Orobanche muteli</i> forma <i>melitensis</i>	Endemic
Family	<i>Orobanche pubescens</i>	
	Plantaginaceae	
	<i>Plantago afra</i>	
Family	<i>Plantago lagopus</i>	
	Caprifoliaceae	
Family	<i>Lonicera implexa</i>	
	Dipsaceae	
Family	<i>Scabiosa maritima</i>	
	Campanulaceae	
Family	<i>Campanula erinus</i>	
	Asteraceae (=Compositae)	
Family	<i>Aetheorrhiza bulbosa</i>	
	<i>Aster squamatus</i>	
	<i>Atractylis gummifera</i>	
	<i>Calendula arvensis</i>	
	<i>Carlina corymbosa</i>	
	<i>Carlina involucrata</i>	
	<i>Carthamus lanatus</i>	
	<i>Centaurea nicaensis</i>	
	<i>Glebionis coronarium</i>	
	<i>Cichorium spinosum</i>	
	<i>Conyza bonariensis</i>	
	<i>Crupina crupinastrum</i>	
	<i>Cynara cardunculus</i>	
	<i>Dittrichia viscosa</i>	
	<i>Filago cossyrensis</i>	
	<i>Hedypnois rhagadioloides</i>	
	<i>Hyoseris radiata</i>	
	<i>Hyoseris scabra</i>	
	<i>Inula crithmoides</i>	
	<i>Inula graveolens</i>	
	<i>Leontodon tuberosus</i>	
	<i>Pallenis spinosa</i>	
	<i>Phagnalon graecum</i> ssp. <i>gingbergii</i>	Rest (MED)
	<i>Reichardia picroides</i>	
	<i>Senecio bicolor</i>	
	<i>Sonchus oleraceus</i>	
	<i>Urospermum picroides</i>	

Order – Monocotyledons

Family	Zanichelliaceae <i>Zanichellia</i> cf. <i>palustris</i>	R, Rest (MI)
Family	Juncaginaceae <i>Triglochin</i> spp.	
Family	Liliaceae <i>Asphodelus aestivus</i> <i>Muscari comosum</i> <i>Ornithogallum arabicum</i> <i>Ornithogallum narbonense</i> <i>Scilla autumnalis</i> <i>Urginea pancration</i>	Rest (MED)
Family	Alliaceae <i>Allium commutatum</i> <i>Allium melitense</i>	Endemic
Family	Asparagaceae <i>Asparagus aphyllus</i>	
Family	Araceae <i>Arisarum vulgare</i>	
Family	Agavaceae <i>Agave americana</i> <u><i>Agave sisalana</i></u>	
Family	Smilacaceae <i>Smilax aspera</i>	
Family	Amaryllidaceae <i>Narcissus tazetta</i>	
Family	Iridaceae <i>Gladiolus segetum</i>	
Family	Juncaceae <i>Juncus hybridus</i>	
Family	Orchidaceae <i>Anacamptis pyramidalis</i> <i>Orchis fragrans</i>	
Family	Cyperaceae <i>Carex flacca</i>	
Family	Poaceae (=Graminae) <i>Arundo donax</i> <i>Briza maxima</i> <i>Catapodium murinum</i> <i>Catapodium rigidum</i> <i>Cynodon dactylon</i> <i>Dactylis glomerata</i> <i>Dactylis hispanica</i> <i>Hyparrhenia hirta</i> <i>Gastridium ventricosum</i> <i>Lagurus ovatus</i> <i>Lamarckia aurea</i> <i>Phalaris minor</i> <i>Piptatherum miliaceum</i> <i>Sorghum halepense</i> <i>Stipa capensis</i>	

Trachynia distachya

APPENDIX 9/3 - Summary of Impacts on Ecology of the site

TYPE OF IMPACT	BENEFICIAL/ ADVERSE	NATURE, SCALE AND TYPE OF IMPACT				POLICY IMPORTANCE	SIGNIFICANCE OF IMPACT	PROPOSED MITIGATION
		Phase	Direct/Indirect	S term/L term	Permanent/Temporary	(Inter, National, Local)	(Major, Minor, Insignificant)	
Loss of habitats and vegetation on site	Adverse	Excavation	Direct	L term	Permanent	Local	Minor, most of habitats are already degraded	
Loss of rare species	Adverse	Excavation	Direct	L term	Permanent	National, possibly International depending on whether <i>Miktoniscus melitensis</i> is present on site	Minor/ Major, depending on whether rare invertebrate species quoted in the LCV are found on site.	A study should be done to identify whether <i>Miktoniscus melitensis</i> is found on site.
Loss of protected plant species	Adverse	Excavation	Direct	L term	Permanent	Local	Minor. Although 9 protected plant species will be lost, only one of them is rare.	Compensatory replanting, and translocation of as much wild thyme from site.
Loss of protected animal species	Adverse	Excavation	Direct	S term	Temporary	Local	Minor. Since most of these species are mobile, they will return eventually	Necessary permit should be obtained from MEPA
Rubble walls	Adverse	Excavation	Direct	L term	Permanent	Local	Insignificant	Minimize extent
Reduced watershed	Adverse	Operation	Indirect	L term	Permanent	National/ international	Could be Major	Monitor water at Ghadira s-Safra
Impact on neighbouring protected areas	Adverse	Excavation/ Operation/ Termination	Indirect	S term/ L term	Temporary. Depends on whether effluent and runoff manages to leave landfill	National/ International	Minor, possibly even Major	All necessary precautions should be taken to isolate landfill from bedrock and runoff
Other neighbouring non-protected areas	Adverse	Excavation	Indirect	S term	Temporary	Local	Minor since surrounding garigue is already degraded	Precautions should be taken to eliminate runoff from landfill

ECOLOGY 9

TYPE OF IMPACT	BENEFICIAL/ ADVERSE	NATURE, SCALE AND TYPE OF IMPACT				POLICY IMPORTANCE	SIGNIFICANCE OF IMPACT	PROPOSED MITIGATION
		Phase	Direct/Indirect	S term/L term	Permanent/Temporary	(Inter, National, Local)	(Major, Minor, Insignificant)	
Air borne dust	Adverse	Excavation	Indirect	S term	Temporary	Local	Insignificant. Area is already exposed to airborne dust	None. Dust will be carried away with rains
Runoff	Adverse	Excavation	Indirect	S term	Temporary	Local	Insignificant. Areas already exposed to such influence	Cut off any runoff from Landfill
Parking area for machinery	Adverse	Excavation	Direct	L term	Temporary	Local	Insignificant. Enough place on site for parking	Provide parking space within Development site
Accidental damage	Adverse	Excavation	Direct	S term	Temporary	Local	Insignificant if avoided	Control truck movement
Loss of trapping sites and Eucalyptus	Beneficial	Excavation	Direct	S term	Temporary	Local	Insignificant	Trapping on landfill and use of alien species to be avoided
Loss of rosemary garigue	Adverse	Excavation	Direct	L term	Permanent	National	Minor	Preserve best population, and use rosemary in later landscaping
Increase in rodent population	Adverse	Operation	Indirect	S term	Temporary	Local	Insignificant, since landraise already exists adjacent to site	Appropriate rodent control measures to be taken

