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St Helena Airport and Supporting Infrastructure

Environmental Statement: Volume 5

Environmental Management Plan

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St Helena Airport and Supporting Infrastructure Environmental Management Plan - Stage 1
Draft Report

Department for International Development and St Helena Government
May 2007

Table of Contents

Preface

SHG/DFID seek to achieve the highest possible standards of environmental management during construction and operation of the works and the Environmental Management Plan (EMP) is seen as being an important element through which this can be attained.

This draft Environmental Management Plan was first issued in May 2007 and formed part of the Employer's Requirements of the Invitation to Negotiate issued to consortia tendering for the Design, Build and Operate Contract in May 2007. As the design of the St Helena Airport and Supporting Infrastructure project progresses it is envisaged that this draft EMP will be revised as appropriate. The EMP will remain in draft form up until the commencement of the construction phase. It is anticipated that changes, both significant and minor, will be incorporated into the EMP as it develops. The EMP will be revised to take account of the following:

- Translate the findings of the latter stages of the Environmental Impact Assessment (EIA) (as presented in the Environmental Statement) into measures which shall be undertaken by the Contractor(s) to avoid, reduce or offset environmental effects within the design and during the construction stages of the scheme.
- Requirements of the planning conditions should Development Permission be granted.
- Mitigation which may be required as a result of an appointed Contractor's specific proposals for the detailed design and working methods. This would follow confirmation of work area boundaries and the detailed location and footprint of components of the scheme within the Airport Development Area (ADA)
- Mitigation identified as a result of any further environmental surveys which would be carried out prior to or during construction.

This draft EMP should be read in conjunction with Volumes 1 to 4 of the St Helena Airport and Supporting Infrastructure Environmental Statement, December 2007.

The EMP will form part of the Employer's Requirements and the Contractor, including the Contractor's Representative, Subcontractors, and Contractor's personnel shall comply fully with the EMP in developing their design and in preparing the CEMP. In this respect the EMP is in place to protect the interests of local residents, the general public, businesses and the environment in the vicinity of the construction works. The measures stipulated in the EMP (in this draft and subsequent revisions) will be contractual requirements under which SHG will be able to enforce compliance by the Contractor. It will apply throughout the entire period of the Contract.

Glossary of Terms

Acoustic Screen	Barrier, such as wooden hoarding, that reduces noise from the point of source.
Contractor	As defined in Conditions of Contract. In the context of the EMP the Contractor refers to the Contractor's Representative, personnel and subcontractors.
Construction Traffic	This means all traffic carrying construction materials or construction personnel except cars, light commercial vehicles (not exceeding 3.5 tonnes gross vehicle weight), minibuses and buses carrying construction personnel to their temporary or permanent place of residence.
Endemic Species	Those species that are found nowhere else in the world.
Environmental Constraint	This refers to areas of land or ecological features, which by virtue of their landscape, ecological or agricultural importance and quality shall be avoided by the Contractor. Some of these areas fall within the Site of the Works. At such locations which are inside the site boundary but outside the permanent footprint of the works of Prosperous Bay Plain, no works will be permitted without the prior agreement of the Engineer.
Hazard	Something with the potential to cause harm
Listed Building	Buildings of historical and architectural interest included in the St Helena Land Development Control Plan, compiled by the Legal, Lands and Planning Department.
Indigenous Species	Those species which are native to a place.
Monitoring	Active: this measures performance against plans and standards that have been worked out and agreed at the start of the contract. It illustrates the management commitment to achieving objectives and maintaining standards. Reactive: this involves the investigation of accidents, incidents and complaints, and the analysis of data from specific investigations.
Sensitive Site	A sensitive site refers to any area or receptor which has the potential to be directly impacted (negatively) by the scheme during construction. Sensitive sites could include residential properties, schools, businesses, ecologically valuable habitat, agricultural land and areas of landscape value.
Silt Traps	A hard-lined stilling well/basin with inflow and outflow pipes for drainage water; designed to slow the flow sufficiently for collection of suspended solids to drop out.
Special Waste	This refers to dangerous wastes and includes, but is not limited to, asbestos, polychlorinated biphenyls (PCBs), batteries, waste oil, halons and CFCs
Street Furniture	Equipment permanently placed along roadsides, for example signs, litter bins, benches and public transport shelters.

Work Site	As defined in Conditions of Contract. Anywhere where the Contractor is carrying out the construction works, including construction compounds and workers' accommodation

List of Acronyms

ANRD	Agriculture and Natural Resources Department – St Helena Government
BS	British Standard
CEMP	Contractor's Environmental Management Plan
CEMPC	Contractor's Environmental Management Plan Co-ordinator
CIRIA	Construction Industry Research and Information Association
DEFRA	United Kingdom Department for Environment Food and Rural Affairs
DFID	United Kingdom Department for International Development
ECO	Environmental Co-ordinator – St Helena Government
EHD	Environmental Health Department – St Helena Government
EMP	Environmental Management Plan
EMS	Environmental Management System
EIA	Environmental Impact Assessment
EIA Stage 1	Findings of the first stage of the EIA – included in Volume 5 of the ITT Report
FIDIC	International Federation of Consulting Engineers
ITN	Invitation to Negotiate
ITT	Invitation to Tender
HSE	United Kingdom Health and Safety Executive
ISO	International Standards Organisation
LAeq	LAeq refers to the "equivalent" average sound level measured using the A-weighting which is most sensitive to speech intelligibility frequencies of the human ear.
MAFF	United Kingdom Ministry of Agriculture, Fisheries and Food – now DEFRA
PBP	Prosperous Bay Plain
PG	United Kingdom Process Guidance note
PPG	United Kingdom Planning Policy Guidance
ppm	Parts per million
PWSD	Public Works and Services Department – St Helena Government
RESA	Runway End Safety Area

RSPB	Royal Society for the Protection of Birds
SHG	St Helena Government
TSP	Total Suspended Particulates
UKEA	United Kingdom Environmental Agency
VDV	Vibration Dose Values

1 Purpose of the Stage 1 Environmental Management Plan

1.1 BACKGROUND AND PURPOSE OF THE EMP

1.1.1 The Department for International Development (DFID) and the St Helena Government (SHG) propose to construct an airport on St Helena. The proposed development will encompass an airport at Prosperous Bay Plain and associated infrastructure including,

- Roads to carry construction traffic;
- A permanent access road;
- A wharf facility for handling materials;
- A new bulk fuel farm;
- Temporary water supply for construction;
- Permanent water supply for operation; and
- Additional utilities required for construction and operation.

1.1.2 This draft of the Environmental Management Plan (EMP) has been prepared in tandem with the Environmental Impact Assessment Stage 1 Report (referred to as the Stage 1 EIA Report) for the St Helena Access Project (herein referred to as the Access Project). The purpose of this draft EMP is to:

- Translate the findings of the Stage 1 EIA Report into measures which shall be undertaken by the Contractor to avoid, reduce or offset environmental effects within the design and during the construction and operational stages of the scheme.
- Provide guidance and set out measures which shall be incorporated into the Contractor's Environmental Management Plan (CEMP).

1.1.3 The EMP forms part of the Employer's Requirements and the Contractor, including the Contractor's Representative, subcontractors, and Contractor's personnel shall comply fully with the EMP in developing their design and in preparing the CEMP. In this respect the EMP is in place to protect the interests of local residents, the general public, businesses and the environment in the vicinity of the construction works. It will apply throughout the entire period of the construction works and operation of the scheme.

1.1.4 The EMP should be read in conjunction with the other documents in the Employer's Requirements including Volumes 3a, 3b, 3c, 3d and 3e. Overlaps between the EMP and other requirements in the Employer's Requirements have been avoided as far as possible. To ensure that all mitigation measures are captured within the Contract the EMP, and Employer's Requirements Volumes 3a, 3b, 3c, 3d and 3e cover both design matters and working practices.

1.1.5 This document includes some environmental requirements which are not the responsibility of the Contractor but are to be implemented by others. The Contractor shall assume that all the requirements set out in the EMP are his responsibility except where it is made clear in the text that other parties will undertake those tasks.

1.1.6 Prior to the award of the Contract the work to be carried out by the Engineer as described in this EMP, will be undertaken by the Employer's Environmental Consultant. The Employer's Environmental Consultant representatives will form part of the Engineer during the Contract period.

1.2 LEGISLATION, STANDARDS AND GUIDANCE

1.2.1 In preparing the EMP reference has been made to St Helena legislative requirements (see Appendix A to this document); however, there are limitations in the coverage of this legislation. The EMP therefore makes reference to other standards and guidance (including UK legislation, British Standards, UK Environment Agency guidance, Health and Safety Executive Guidance) in order to ensure good practice. These other standards shall apply to the Contractor's work and shall be enforced through the Contract as per the Employer's Requirements, Volume 3a Section 2.4.3.

1.3 THE FINALISATION OF EMP AND CEMP

1.3.1 This EMP is based on the design provided in the tender documentation. The EMP will therefore need to be updated to take into account the results of the Environmental Impact Assessment (EIA) which is being undertaken by the Employer's Environmental Consultant (the Engineer) and the evolving design prepared by the Contractor. It will also need to take into account any conditions attached to the outcome of the application for development permission or issues arising from the finalisation of the detailed design. The EMP will be finalised prior to the commencement of construction.

1.3.2 The requirements of the EMP shall be translated into the CEMP to be prepared by the Contractor. The Contractor shall submit, as part of his tender return documents, a draft CEMP structured in accordance with Schedule V4.1.9 Environmental Management Requirements. The final CEMP shall be completed and submitted to the Engineer for approval four weeks prior to construction commencing.

1.3.3 Non-compliance with the EMP shall be dealt with in accordance with clauses 7.5 and 7.6 of the FIDIC Conditions of Contract as amended

1.4 STRUCTURE OF THE ENVIRONMENTAL MANAGEMENT PLAN

1.4.1 This document is structured as follows:

Section 1 Purpose of the Stage 1 Environmental Management Plan

This section describes the purpose of the Stage 1 Environmental Management Plan including its relationship with the CEMP. It also describes the implementation and monitoring of the EMP and CEMP.

Section 2 General Matters Applicable to Construction Under the EMP

This section covers all general aspects of construction works that may impact on local communities and the environment. These are identified under the topic headings listed below:

- Roads, Footpaths and Recreation Areas
- Agriculture
- Noise and Hours of Working
- Vibration
- Dust and Air Pollution
- Terrestrial and Marine Ecology
- Handling and Disposal of Contaminated Materials (Including Waste)
- Protection of Surface Water and Groundwater Resources
- Marine Environment
- Site Boundaries/Hoardings/Temporary Structures on the Public Highway
- Archaeological Remains
- Built Heritage
- Other Site Activities

Section 3 ***General Matters Applicable to Operation Under the EMP***

This section covers general aspects of the operation of the airport that may impact on local communities and the environment:

- Roads and Footpaths
- Noise
- Air Pollution
- Terrestrial Ecology
- Handling and Disposal of Waste
- Surface Water and Groundwater Resources
- Marine Environment

Section 4 Landscape and Ecological Requirements.

This section covers the particular requirements appertaining to the protection of the landscape and ecology of the areas affected directly and in the vicinity of the Work Site(s). It specifies the mitigation plan by which the effects shall be minimised through the following:

- Protection of existing features and species of importance and interest.
- Design and implementation of appropriate restoration measures.
- Design and implementation of compensation measures.
- Appropriate management and maintenance of the areas following construction to ensure successful implementation of the mitigation.

1.5 IMPLEMENTATION AND AUDITING OF THE EMP AND CEMP

1.5.1 Roles and Liaison

1.5.1.1 A suitably trained Contractor's Environmental Management Plan Co-ordinator (s) (CEMPC) nominated by the Contractor shall be present on-site whenever work is in progress. The CEMPC(s) shall be the point of contact dealing with environmental issues, for the Engineer, the Contractor's employees, sub-contractors, the relevant Departments of SHG and other regulators, and members of the public. The CEMPC is also responsible for controlling the construction impact arising from the activities of the Contractor and his sub-contractors in accordance with the EMP and CEMP.

1.5.1.2 The CEMPC shall be 'on call' 24 hours per day and shall be aware at all times of activities being undertaken on site. He/she shall maintain a daily log, recording all environmental issues, events and environmentally related dealings with third parties. The CEMPC shall prepare, implement, manage, review and revise the CEMP with the sole purpose of ensuring that the environment is safeguarded at all times from anticipated or unexpected adverse impacts throughout the construction programme. The Curriculum Vitae of the individual appointee(s) shall be submitted to the Engineer at least 28 days prior to the commencement of work on site. Should the Contractor wish to appoint an alternative member of staff to the role of CEMPC, the CV should be submitted to the Engineer for review (see Employer's Requirements Volume 3a, section 2.2.1), 28 days prior to change in personnel.

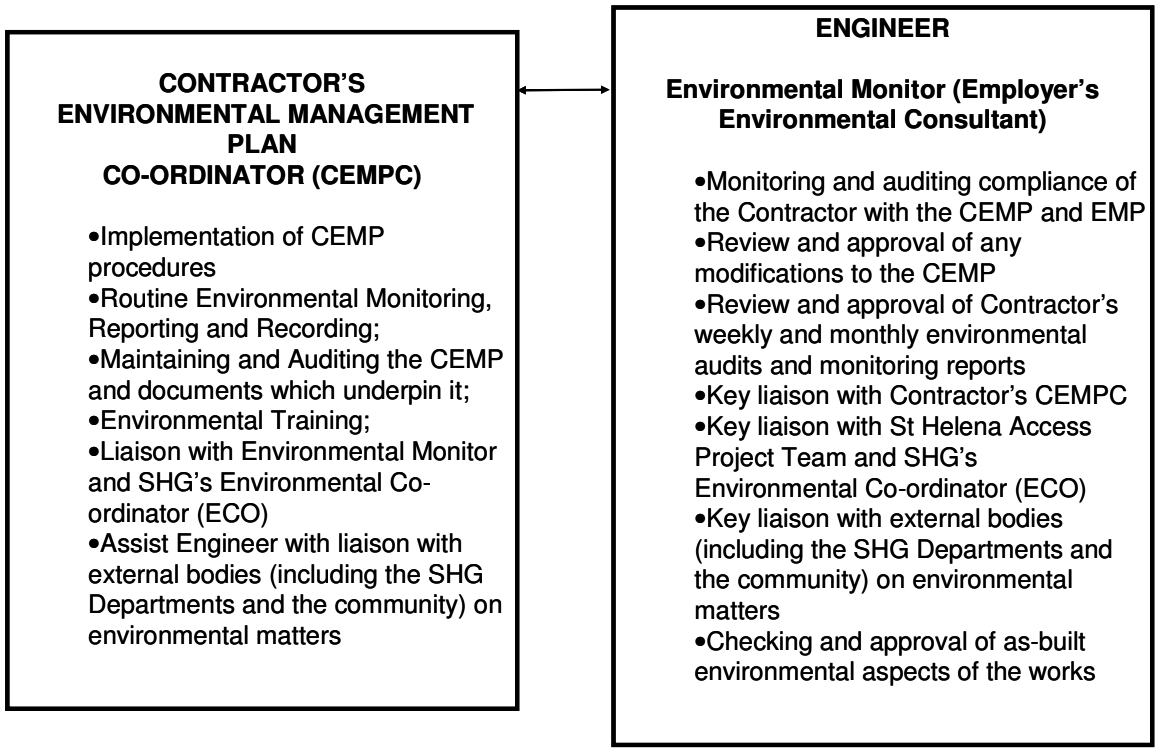
1.5.1.3 Within the Contractor's team the CEMPC shall have the authority to ensure the CEMP can be effectively implemented. He/she shall have the authority to give formal notification to the Engineer of any transgressions in respect of the CEMP and thereby notify the relevant party who will impose the required sanctions on the construction process.

1.5.1.4 An Environmental Monitor will be included in the Engineer's Team. Diagram 1.1 below summarises the roles of the CEMPC and the Engineer. The Engineer will carry out the following:

- Regular inspections of the Contractor's work site, on a not less than weekly basis.
- Weekly routine audits of the Contractor's compliance with the CEMP (which will have been prepared to reflect the requirements of the EMP) – site activities and record keeping.
- Weekly routine environmental monitoring.
- Monitoring or inspection of site activities in response to incidents, breaches of the CEMP (which will have been prepared to reflect the requirements of the EMP) or complaints received from a third party.
- Inspections of works to ensure that environmental mitigation measures incorporated into the design have been implemented to the satisfaction of the Engineer.
- Be the main point of contact for the CEMPC.

1.5.1.5 The Environmental Co-ordinator (ECO) of St Helena Government's Development and Economic Planning Department is responsible for developing and enforcing regulations and policies relating to the environmental protection of St Helena.

Diagram 1.1 Summary of the roles of the CEMPC and the Engineer



1.5.2 Document Control and Reporting

1.5.2.1 The CEMP shall be submitted to the Engineer for review at least 28 days in advance of construction commencing. Subsequently, any minor amendments to the CEMP shall be made to a Controlled Copy held by the CEMP Co-ordinator by hand in red ink and dated. Details of minor amendments shall be summarised in the weekly audit reports to the Engineer. The CEMP should be updated and re-issued to the Engineer for review at least every 6 months. Should several minor amendments be required or a major amendment be required the CEMP shall be revised and reissued.

1.5.2.2 The Contractor shall carry out daily inspections of the work site to check compliance with the CEMP. In addition the Contractor shall prepare and implement weekly routine audits of the procedures in the CEMP to a schedule to be agreed with the Engineer. A record of the

observations made during inspections and audits shall be made on a daily basis in the CEMP log which shall be made available for inspection by the Engineer immediately upon request. A procedure to record and report complaints received from third parties, incidents or breaches of requirements of the CEMP shall be prepared by the Contractor and agreed with the Engineer.

1.5.2.3 The Contractor shall submit a weekly environmental report to the Engineer (also to be copied to the ECO) summarising the findings of the daily inspections and weekly audits and actions taken to rectify breaches of the CEMP and action taken in response to incidents or complaints. The report shall also include the results of environmental monitoring carried out during the week. A report shall be submitted within 24 hours of a serious event such as a breach of, or serious risk of breach of, lease, licences, consents, agreements, regulations, bylaws or planning conditions.

1.6 LIAISON

1.6.1 St Helena Access Project Team will be responsible for all public relations, information issues and press related matters. It shall undertake the role of liaison with the relevant Department of SHG, members of the public, the press and the media. The St Helena Access Project Team will establish procedures for notifying the public in advance of any alterations to the construction programme or working hours that have been agreed with the Contractor and the relevant Departments of SHG. The Contractor shall be required to assist with liaison and provide supporting information where required.

1.6.2 The Contractor shall put in place a complaints procedure whereby members of the public can, if necessary, make contact by telephone using a “hot line” facility which shall be answered by a person, not an answer phone, during all hours when works, including deliveries, are taking place and also provide details of the named contacts to whom all written complaints should be addressed.

1.6.3 All complaints to the Contractor, SHG or the Engineer shall be logged and compiled to provide a single report held at the Contractor’s site office. Each complaint shall be investigated by the CEMPC or their deputy upon the day of receipt and preferably immediately upon receipt of notification. As soon as possible after investigating a complaint, the CEMPC or the investigating officer shall inform the Engineer and the complainant by telephone, and/or written communication, of the results of their investigation and actions taken. The Engineer will ensure the ECO is kept informed.

1.6.4 The Contractor shall ensure that details of the relevant contacts of his team are presented to the Engineer’s office. The CEMPC shall act as a point of contact for liaison with the Engineer, the relevant Departments of SHG and members of the public. The events of an inspection by the SHG Environmental Coordinator or a representative from another SHG Department or third party shall be recorded by the Contractor and reported to the Engineer.

1.7 TRAINING IN THE REQUIREMENTS OF THE EMP AND CEMP

1.7.1 The Contractor shall prepare and implement a training programme to ensure that all site staff are aware of the requirements of the EMP and CEMP. The training package shall be reviewed by the Engineer in consultation with third parties including the relevant Departments from SHG. The package shall include materials for use in induction training and tool box talks.

2 General Matters Applicable to Construction under the EMP

2.1 INTRODUCTION

2.1.1 This section identifies the general aspects of construction works which could impact on local communities and the environment. Activities specific to landscape and ecology are addressed in Section 4.0 of the EMP.

2.2 ROADS, FOOTPATHS AND RECREATION AREAS

2.2.1 The Contractor's CEMP shall set out the proposed measures to be taken with respect to traffic and safety in a Traffic Management Plan, which shall be reviewed by the Engineer prior to the commencement of work. The Traffic Management Plan shall be prepared in consultation with the relevant Departments of SHG. Upon commencement of the construction work the measures shall be implemented and complied with throughout the construction period.

2.2.2 Traffic and Safety

2.2.2.1 In addition to the requirements set out in the Conditions of Contract and the Employer's Requirements Volume 3a sections 1.9.1, 1.10.3 and 1.10.5, measures to be taken with respect to traffic and safety shall include:

- Access to the site via Longwood shall be avoided by construction and other site related traffic unless alternative arrangements are agreed with the Engineer.
- Temporary signing shall be used to direct construction traffic to each active section of the site where construction is taking place, to direct construction traffic to appropriate delivery/collection points and to clearly signpost designated routes to and from those points.
- Temporary signing shall be used to indicate any restrictions on vehicle types or sizes or traffic types on any route and to indicate the designated haul routes.
- A speed limit of 10 mph on unmade haul roads (i.e. freshly stripped ground with no graded surface and rough tracks entering or within sites) shall be enforced and such limits shall be displayed on appropriately designed signs, located at all entrances to each construction site. A speed limit of 15mph shall be enforced for construction traffic passing along sections of the access/haul road through residential and commercial areas.
- Adequate signing, lighting, safety fencing and other appropriate measures as necessary shall be used wherever works are in progress on any road or other route to ensure the safety of all groups of users of that road or route.
- The Contractor shall adhere to clause 4.14 Avoidance of Interference of the Conditions of Contract. Where, for any reason, it is necessary to close an access for a temporary period, the arrangements shall be agreed with the Engineer in consultation with the relevant Department of SHG and with all of the owners and occupiers of the land affected. Alternative access arrangements shall be provided and these may include limiting the access closure to part of the day.

2.2.3 General Measures

2.2.3.1 The following requirements apply at all times to the construction works:

- Any temporary footways and ramps on roads shall be of an adequate width and surfaced in materials to the satisfaction of the Engineer.
- In populated or commercial areas, all openings or obstructions on roads or footways shall be barricaded with a continuous rail (lit at night) strong enough to offer necessary resistance should someone who is visually impaired walk into it.
- All pedestrian routes diverted onto the roads shall be clearly defined by continuous barriers, constructed to the reasonable requirements of the Engineer.
- All footpath crossing points shall be properly constructed to a standard to be agreed with the Engineer in consultation with PWSD. Vehicles shall only be allowed to cross footpaths via a properly constructed crossing.
- Access which is deemed to include both the route and entrance to any work site by lorries and plant shall be as agreed with the Engineer and the appropriate Departments within SHG, including the Police.
- All parked vehicles or vehicles waiting to enter any work site or area of construction shall switch off their engines within two minutes of arrival.
- All street signs, benches, public transport shelters, etc. and other features such as vegetation in the vicinity of the construction works shall be carefully protected in accordance with the requirements of the Engineer. Any damage caused by the Contractor shall be made good as soon as practicably possible to the complete satisfaction of the Engineer. Suitable measures shall be implemented by the Contractor to protect vegetation as specified in Section 4 of this document – The Landscape and Ecological Requirements.
- Any signs, public transport shelters, benches etc, or other obstructions outside the area to be occupied by the Contractor which the Contractor requires to remove in order to gain access for temporary works shall, subject to the prior consent of PWSD, be removed and put back/replaced if appropriate on completion of the works by the Contractor.
- If works are to be carried out to roads elsewhere on St Helena in order to facilitate the movement of plant, materials etc, then those works should satisfy the same requirements that apply to the Work Site in general covered in this EMP.

2.2.3.2 So far as is reasonably practicable, any road or designated haul access route, including drainage systems and verges, shall at all times be kept free from mud, loose materials and other debris. The Engineer will closely monitor mud and dust suppression on the site. To comply with these requirements the Contractor shall take the following measures:

- The Contractor shall prevent mud, dirt, debris or other loose material from the Site being deposited outside the Site on to roads and footpaths.
- The haul road shall be paved as early as possible so as to reduce dust arisings, noise nuisance and the demand for water for use in dust suppression;
- Ensure that all vehicles entering, parking and leaving any work site are free of any material that might potentially be deposited on any road. Appropriate measures could include:
  - The provision of a level hard surfaced area and easily cleaned area at the entrance to any part of the site of to allow vehicles to be cleaned and sheeted before going off-site;
  - The provision of wheel washing facilities at the exits from site compounds and work sites including, where practicable, mechanical wheel spinners. These facilities shall be provided with adequate drainage via settlement tanks and regular maintenance of settlement tanks;
  - Loading any vehicle to avoid the risk of any part of the load falling from the vehicle onto any road or designated haul route;

- Sheeting of each vehicle carrying any material likely to give rise to dust generation and to prevent any part of the load falling from the vehicle during its journey to its final destination.

- The designated haul road shall be constructed in accordance with the Employer's Requirements Volume 3a - section 1.10.3.2 Access Roads.
- An approved mechanical road sweeper to clean the work site and any mud or debris deposited by site vehicles on roads or footpaths in the vicinity of each work site.

2.2.4 *Footpaths and Recreation Areas*

2.2.4.1 In respect of any footpaths and recreation areas within the Site the Contractor shall ensure that:

- Footpaths shall be kept open wherever reasonably practicable. Where it is not possible to keep footpaths open an alternative route shall be agreed with the Engineer and relevant Departments of SHG. Proposals for the temporary or permanent closure or diversion of any footpaths, including Post Box Walks and other recognised routes shall be developed during the design and incorporated in the CEMP.
- The Contractor shall not cause obstruction of footpaths and shall prevent litter and debris and other waste from being deposited on footpaths. Regular patrols to clear items shall be carried out by the CEMPC.

2.2.4.2 Temporary closures of Rupert's Beach shall be kept to an absolute minimum. The community shall be informed at least two weeks in advance of any temporary closure period. The duration and purpose of any closure will be communicated through the radio and newspapers. The Contractor shall inform the Engineer who will arrange for the notice to be published through the St Helena Access Project Team.

2.3 AGRICULTURE

2.3.1 In accordance with the Employer's Requirements Volume 3a Section 1.8.3 Imported Plant and Materials and section 1.8.4 Contractor's Temporary Wharf, certificates shall be made available to the Engineer confirming that the Contractor's plant and equipment has been cleaned prior to shipping. Plant and equipment must have been cleaned and where necessary disinfected prior to shipping to prevent introduction of non-native species, including eggs, seeds and other pathogens etc.

2.3.2 Inbound deliveries will be screened by the Employer on arrival and, if not deemed free of potentially contaminating material, then in situ measures shall be taken to ensure this condition prior to unloading. In such circumstances the Contractor shall submit measures to deal with potential contamination, and may not commence unloading unless approval is given by the Engineer and agreed measures have been fully complied with. The Contractor shall be obliged to rectify such issues to a method reviewed by the Engineer in consultation with the relevant Department of the SHG including Agriculture and Natural Resources Department (ANRD) and Environmental Health Department (EHD). Where it is not possible to eliminate the contamination through in-situ measures the Employer reserves the right to refuse permission to unload.

2.3.3 The Contractor shall prepare and implement procedures to prevent damage to adjacent agricultural land, field drainage and irrigation systems during the Works.

2.3.4 Any damage to existing agricultural land as a result of access, accommodation works or other works shall be reinstated as soon as possible. Re-instatement of new or existing agricultural pasture or arable land shall include remediation of compaction, re-instatement of drainage and irrigation where applicable and restoration of the land to the specification of the Engineer. As a minimum this would entail reinstatement of agricultural fields to ensure and enable continued future farming practices. This would entail a full programme of

reinstatement to address the potential construction effects on drainage and topsoil and subsoil compaction.

2.3.5 Damage and disruption to field drainage and irrigation outside the Works shall be avoided. Any drains which are disrupted in the course of the accommodation works and / or mitigation works which affect agricultural land and which are to remain shall be intercepted and piped away to a suitable outfall or reinstated.

2.3.6 No materials, plant or debris shall be stored or left on any agricultural land outside the Work Site.

2.3.7 Work affecting agricultural land or farms shall be carried out in accordance with the UK DEFRA guidance (namely the Code of Good Agricultural Practice for Protection of Water and Air MAFF 1998) for preventing the spread of plant and animal diseases and in consultation with ANRD.

2.3.8 All land used for temporary construction works and outside the area to be developed shall be fully reinstated on completion of works, or earlier.

2.3.9 During construction, topsoils shall be stripped and stored to prevent soil structure damage. Soil stripping, storage and placing shall comply with the guidelines set out in British Standard BS6031:1981 Code of Practice for Earthworks and BS3882:1994 Specification for Topsoil) as far as reasonably practicable. In addition, no other material shall be placed on top of the storage heaps and construction plant shall not pass over the storage heaps. Compaction and contamination of the topsoil shall be prevented by fencing and covering as appropriate. If the soil has to be stored for more than 6 months, this stock pile shall be seeded with a deep rooting grass / legume seed mixture, to be reviewed by the Engineer to maintain structure and aeration, to minimise weed colonisation and to stabilise the stockpile.

2.3.10 In accordance with the Conditions of Contract clause 4.14, access to agricultural fields shall be maintained.

2.4 NOISE AND HOURS OF WORKING

2.4.1 Noise levels on site shall be controlled in accordance with British Standard BS 5228: 1997 Noise and Vibration Control on Construction and Open Sites.

2.4.2 Noise limits and other limited parameters will be specified by the Engineer on completion of the EIA. Limits for noise and criteria to minimise noise have been prepared as a result of the first stage of the EIA. However, it is possible that noise limits and mitigation required could be more stringent depending on the Contractor's specific proposals. For the purposes of this EMP, work sites shall include the main working areas as described in the Employer's Requirements Volume 3a, plus those locations utilised by the Contractor for the purposes of delivery and storage of plant, machinery, materials and the siting of cabins, workers accommodation, etc., in connection with the construction works.

2.4.3 During the EIA process clearly defined noise criteria will be developed which shall be complied with by the successful Contractor in relation to the proposed method of working, type of plant to be used, and noise mitigation measures for each separate work site. These will include criteria for blasting activity. Prior to the commencement of any construction work, the Contractor is required to demonstrate to the Engineer that it shall comply with these criteria. The Contractor shall allow access to work sites for the Engineer or other representative from SHG Departments (including the Environmental Co-ordinator and any technical support) to undertake noise measurements, for the purpose of monitoring compliance with these limits and criteria. If the Contractor fails during the period of the construction work to comply with these criteria it may be required to cease work by the Engineer or the Environmental Health Department or the Police. In such circumstances work shall cease immediately and appropriate action taken to remedy the situation in accordance with clauses 7.5 and 7.6 of the Conditions of Contract.

2.4.4 Noise mitigation measures to be included are:

- Where possible, use of electrical items of plant instead of diesel or petrol plant, especially in sensitive locations.
- Site compounds to be surrounded with fencing or other barriers, where appropriate, and continuously running plant, for example generators and pumps, to be housed in acoustic enclosures.
- Exhaust silencing and plant muffling equipment to be maintained in good working order.
- Use of temporary screens at sensitive locations such as close to residential properties or sensitive ecological sites where they would be effective.
- All plant, whether stationary or mobile, shall only have its engine running when actually in use or when being prepared for use. Covers/enclosures on plant which reduce emitted noise levels shall be maintained in good condition and shall be kept closed at all times when the plants engine is running.
- A sign shall be erected at the entrance to all work areas outlining the measures which operatives shall adopt to ensure minimisation of noise and vibration emissions and other nuisance from the site, such signs to be erected before any works commence from any particular sites, the sign wording and size to be agreed prior to the commencement of the works with the Engineer.
- Use of plant which has a greater capacity than that required i.e. oversized plant should be avoided.

2.4.5 It should be noted that the measures listed above are not exhaustive. Further reasonable measures may be required from time to time which should be agreed between the Contractor and the Engineer.

2.4.6 If the Contractor wishes to change his proposed method of working once the construction works commence then this can only be achieved following agreement with the Engineer.

2.4.7 The hours of working shall be limited to the following at the specified locations:

- Area A - Airport – unrestricted
- Area B – Remote Obstacle Lighting and Navigational Aids sites Remote to the Airport – 0700-18.00 Mon to Fri, 07:00 – 13:00 Sat
- Area C – Access Road between Rupert's Bay and the Airport - Construction and use of haul roads - 0700-18.00 Mon to Fri, 07:00 – 13:00 Sat (to be agreed with the Engineer)
- Area D – Bulk Fuel Installation - 0700-18.00 Mon to Fri, 07:00 – 13:00 Sat
- Area E – Rupert's Bay and Wharf – construction and use of the materials delivery in Rupert's Bay & Valley 07.00 – 18.00 Mon to Fri, 07:00 – 13:00 Sat (to be agreed with the Engineer)
- Area F – Water Supply and Abstraction Point and Pipeline - unrestricted

2.4.8 Night time working (other than on Area A - the main airport site) shall be kept to an absolute minimum. In instances where the Contractor proposes additional or alternative working hours for construction reasons or the Engineer requires the Contractor to undertake certain works outside these hours, agreement shall be sought between the two parties. Procedures for notifying the public of changes to working hours shall be carried out in accordance with Section 1.6 of this document.

2.4.9 There may also be restrictions, such as construction work being permitted in some areas during certain seasons (e.g. the main Wirebird nesting season), and in specific areas.

2.4.10 The Contractor shall provide suitably designed and constructed acoustic screens (specifications shall be developed during the EIA) which shall be used as necessary, where they would be effective, and when directed by the Engineer.

2.4.11 The maximum noise limits will be stipulated during the EIA process. The limits will be set in light of the detailed approach to construction specific location and proximity to works and

other factors related to construction and sensitivity of nearby receptors. At this preliminary stage it is likely that the limits will be based on the following:

Daytime: The maximum limit at any sensitive site shall not exceed 70 dB LAeq (1hour)

Night-time: The maximum limit at the first-floor façade of any sensitive receptor shall not exceed 45 dB LAeq (1hour)

2.4.12 Noise Monitoring

2.4.12.1 This section describes the noise monitoring which shall be undertaken by the CEMPC. Noise measurements will also be undertaken by the Engineer to ensure compliance with the specified limits.

2.4.12.2 Equipment

Noise levels at the four monitoring locations identified in Section 2.4.12.4 below shall be monitored and recorded using a portable Type 1 precision Integrating Sound Level Meter with tripod during routine noise audits or when responding to specific complaints of noise nuisance.

2.4.12.3 All noise monitoring equipment shall be maintained, calibrated and operated in accordance with the manufacturer's requirements and recommendations. Records of calibration shall be maintained.

2.4.12.4 Procedures and Logistics

Noise measurements shall be undertaken at the following four locations:-

1. Government Garage
2. Residential property in Rupert's Valley adjacent to haul road.
3. Residential property at Deadwood adjacent haul road.
4. Residential property at Bottom Woods adjacent to haul road.

2.4.12.5 The following noise parameters shall be measured and recorded during each audit:

- LAmax, LA90 and LAeq over 1, 8 and 16 hour periods

2.4.12.6 Routine measurements of noise shall be undertaken by the CEMPC to determine the effectiveness of the CEMP and its control measures. These routine audits shall be undertaken either at specific locations and times when it is known that particular construction activities shall have the potential to generate noise, e.g. during blasting or night-time activities, or as a direct response to complaints or noise or vibration, or, in the absence of preceding factors, as least twice per week on a rotating basis at 4 No. monitoring locations. Where audits are undertaken in response to specific activities or complaints, the monitoring location shall be either at the complainant's property or at a suitable known reference distance from the Works so that any additional attenuation factors can be determined in accordance with the procedures of BS5228. Monitoring will also be carried out by the Engineer at regular intervals.

2.4.12.7 In the event of the need for night-time working, the Contractor's approach should be to predict potential impacts, incorporate appropriate mitigation measures and utilise the routine audit procedures to monitor and evaluate both ambient and construction noise levels at such times that night-time works have to be undertaken. Appropriate steps according to the degree of noise change relative to the existing ambient noise level will then be employed. In addition, the Contractor shall liaise with the Engineer and relevant Department of SHG in accordance with procedures outlined in Section 1.6 and 2.4.13 so that appropriate controls, consistent with BS5228, are implemented.

2.4.12.8 Noise Data Management

2.4.12.9 Data from monitoring shall be downloaded to the host computer on a daily basis and the data shall be analysed for presentation to the Engineer on a weekly basis. The results shall be stored in a computerised database compatible with Excel and shall be backed up.

2.4.12.10 Data from the Noise Monitoring should be presented in tables and graphs and comparison should be made with the noise limits stipulated in Section 2.4.11.

2.4.12.11 Data Reporting
Data shall be prepared in the form of a summary report which shall also include:

- details of major construction activities for the week,
- details of any complaints received and the action taken,
- weather conditions,
- calibration results,
- compliance checks against the noise limits, and
- actions taken in the case of any periods of non-compliance.

2.4.12.12 The summary report shall be issued to the Engineer on a weekly basis during the week following the collection of data and, therefore, shall be available for the Engineer to release to the SHG Environmental Health Officers for their consideration.

2.4.13 Control Procedures

2.4.13.1 On those occasions when specific construction activities with the potential to generate significant levels of noise or vibration are to take place in the vicinity of a sensitive receiver or at a location or distance likely to give rise to concern, and upon commencement of these works, the Contractor shall undertake a noise audit consistent with that set out in Section 2.4.12 in order to check compliance with the limits stipulated above. If measured levels are found to exceed the limits, appropriate measures shall be immediately initiated to ensure that levels of noise remain within accepted limits.

2.4.13.2 The source of the noise causing a complaint shall be identified and any appropriate action to mitigate against it shall be instigated without delay. Or, if nuisance cannot be prevented, even with additional mitigation, consideration shall be given to the suspension of the offending construction activity, where safety and operational constraints allow, until appropriate action can be implemented.

2.4.13.3 The CEMPC should, subject to the nature of the complaint and the location and type of construction activities being complained of, consider the need for portable monitoring in the form of a noise and vibration audit consistent with Section 2.4.12. Appropriate records of the date, time, location and details of measurements shall be placed in a log within the site office and reported to the Engineer. If the portable monitoring indicates exceedance of limits stipulated within the EMP, then appropriate measures shall be implemented to bring emissions within the agreed limits.

2.4.13.4 From measurements at routine audits on the day of collection any site showing levels exceeding or likely to exceed the noise limit, the CEMPC shall inform the Engineer and shall also investigate the cause and implement appropriate controls to bring emissions within the agreed limits.

2.5 VIBRATION

2.5.1 The Contractor shall ensure that all reasonable measures are taken to protect local residents, nearby property and the occupiers thereof from nuisance and physical damage that may be caused by vibration. This includes controlling site activities such as blasting

and vehicle movements along access roads. During subsequent stages of the EIA, the Employer's Environment Consultant will, as far as practicable, prepare predictions of construction vibration in order to establish achievable vibration levels at specific work sites. The criteria which shall be complied with by the successful Contractor in relation to the proposed method of working, type of plant to be used, and vibration mitigation measures for each work site shall be refined. Although unlikely to be used due to the nature of the ground conditions, the use of impact driven piles shall be avoided if close to a sensitive receptor and as far as practicable. In particular the Contractor shall be required to comply with the provisions of BS 6472 Guide to human response to vibration in buildings (1Hz to 80Hz), and BS 7385 Evaluation and measurement for vibration in buildings (Part 2: Guide to damage levels from ground borne vibration). Blasting shall be conducted so that it shall not cause damage to property or nuisance.

2.5.2 The predicted vibration level, known as the Vibration Dose Values (VDV) shall then be compared to Table 7 in the Appendix of BS 6472, (reproduced below as Table 2.1), to identify the likelihood of complaint:

Table 2.1: Vibration Dose Values (ms-1.75) above which various degrees of adverse comment may be expected in residential buildings (taken from BS 6472: 1992)

Place	Low probability of adverse comment	Adverse comment possible	Adverse comment probable
	VDV, $ms^{-1.75}$		
Residential buildings, 16h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings, 8h night	0.13	0.26	0.54

2.5.3 It should be noted that vibration annoyance is not related to comparison of pre and post-development vibration levels, and pre-development vibration levels are not usually necessary to assess the likelihood of vibration damage or annoyance from any new vibration sources to be introduced to an area.

2.6 DUST AND AIR POLLUTION

2.6.1 The Contractor shall take all necessary measures to avoid creating a dust nuisance and shall, prior to commencement of any construction work, submit to the Engineer a statement, for approval, setting out the proposed measures to be taken to prevent dust nuisance, which shall be reviewed by the Engineer and the relevant Department of SHG prior to the commencement of any construction work. Upon commencement of the construction work, the reviewed statement shall be implemented and complied with throughout the period of the construction work.

2.6.2 Additional control measures and site boundary dust monitoring are likely to be required, depending upon the working methods employed. Contractor's monitoring shall be daily visual inspections at all work sites. The Engineer will supplement this by undertaking routine audits using a hand held dust meter in areas of major construction activity, or areas when visible suspended or deposited dust is observed. The Contractor's CEMPC should report and log all observations of visible dust to the Engineer immediately. The procedure described in Section 1.5.2 Document Control and Reporting shall then be followed. The Engineer will carry out dust measurements of total suspended particulates (TSP) and finer

particles at regular intervals, in response to incidents and/or complaints. All measured values will be logged and reported to the Contractor and the relevant Departments of SHG.

2.6.3 Examples of measures to prevent dust nuisance to be included in the Contractor's statement are:

1. The haul roads shall be paved as early as possible so as to reduce dust arisings, noise nuisance and the demand for water for use in dust suppression;
2. Potentially dusty site compounds within and in close proximity to residential and commercial areas shown on Figure 5.1 in Volume 3 of the ES and close to other sensitive areas (as shown on Figure 1 in this EMP and described in bullet 21 below) shall be enclosed with solid hoardings to a height of at least 2m where appropriate.
3. Where feasible, vehicles shall be routed and construction plant positioned at maximum possible distances from sensitive receptors and residential areas.
4. Material stockpiles shall be compacted profiled where appropriate as agreed with the Engineer. Potentially dusty materials/construction sites shall be damped down using suitable water sprays during dry weather. The Contractor shall be aware that compaction of some stockpiles may not be appropriate depending on the end use of the material (see section 2.3.9)
5. Where appropriate, re-vegetation of the surface of long term soil stockpiles shall be agreed by the Engineer. The Contractor shall be aware that re-vegetation of some stockpiles may not be appropriate depending on the end use of the material (see section 2.3.9).
6. The surfaces of stockpiles or exposed surface of the site shall be sprayed regularly to maintain surface moisture unless the surface has formed a crust after spraying or rainfall. Protect crusted surfaces from mechanical and human disruption.
7. Temporary stockpiles of materials shall be shaped to reduce wind blown dust
8. Plan and control activities to minimise the area of land disturbed within all the working areas at all times during the works to limit the area from which dust can be generated.
9. Where conveyors are used they shall be fitted with drop chutes. The surface of the material on the conveyor shall be sprayed with water after deposit onto the conveyor if practicable, where there is a likelihood of a dust problem.
10. Storage of cement and other dust generating materials in silos with appropriate filters and overfill alarms or storage in bags.
11. All surfaced haul roads in regular use shall be mechanically cleaned after being sprayed to suppress dust arisings. Care shall be taken to prevent the emission of dust from the air outlets on vacuum road sweepers.
12. The installation and use of vehicle wheel and body washing stations at exit points from the Contractor's site to public roads, where necessary and practical.
13. A speed limit of 10 mph on all unpaved haul roads (i.e. freshly stripped ground with no graded surface and rough tracks entering or within sites) shall be enforced and such limits shall be displayed on appropriately designed signs, located at all entrances to each construction site. A speed limit of 15mph shall be enforced for construction traffic passing along sections of the access road through residential and commercial areas.
14. Limitation of vehicle movements on unmade roads
15. Additives and binders may be added to water at times of major dust generation potential (dry windy weather) for dust suppression subject to the approval of the Engineer.
16. Vehicles carrying spoil and other dusty materials outside of construction sites shall be sheeted where practicable.
17. Dust generation shall be minimised during the loading of trucks. The potential for dust generation associated with the transfer of materials onto vehicles is to be controlled by

the enclosure of materials transfer equipment, load and unload in areas protected from wind, .the wetting of materials where practicable, and the minimisation of drop heights.

18. All open fires are prohibited, this includes fires for the disposal of vegetation, packaging, or any other material. Incinerators could be used as per Schedule V5.1.1 Social Impacts.
19. Cutting or grinding equipment shall be fitted with dust suppression where practicable.
20. All heating and cooking facilities at the workers accommodation camp and site offices shall be fuelled by gas/LPG or electricity. Open fires using solid fuels or waste materials is prohibited.
21. Sensitive sites include residential properties, community facilities including schools, amenity areas, including footpaths and the beach at Rupert's Bay, businesses (in particular the fish processing plant in Rupert's Bay) and ecologically sensitive areas.

2.6.4 The Contractor shall take all necessary precautions to prevent the occurrence of smoke emissions or fumes from site plant or stored fuel oils for safety reasons and to prevent as far as is reasonable, such emissions or fumes drifting into residential areas, nearby workplaces or areas of public open space. In particular, plant shall be well maintained and measures taken to ensure that engines are not left running for long periods when not directly in use. Demolition and construction vehicles should where practical be reasonably new and conform to Euro III standards (see Appendix B of this document) or equivalent. Plant which emits visible emissions after warm-up shall be taken out of service either repaired or replaced.

2.6.5 On those occasions when specific construction activities with the potential to generate significant levels of dust shall place in the vicinity of a sensitive receiver or at a location or distance likely to give rise to concern the Contractor shall liaise with the owner/occupier and the Engineer in advance. He shall explain the purpose, duration, nature of the works and likely effects. Upon commencement of these works, the Contractor shall undertake an increased frequency of inspection and reporting to the Engineer. If dust generated is deemed to be unacceptable, additional mitigation measures may need to be implemented to ensure that levels of dust are reduced.

2.6.6 It should be noted that the measures listed above are not exhaustive. Further reasonable measures may be required from time to time which should be agreed between the Contractor and the Engineer. If a dust nuisance or annoyance does arise, then such measures as are required to prevent nuisance or annoyance shall be adopted by the Contractor with the agreement of the Engineer.

2.6.7 The effectiveness of the dust control measures shall be reviewed at regular intervals by the Contractor and the Engineer.

2.6.8 The specification for the asphalt and concrete batching plants shall be agreed with the Engineer. The cement batching plant shall comply with PG3/1 (2004, UK Process Guidance Note). There shall be no visible emission from plant to cross the site boundary. The plant shall meet and emissions limit of 50mg/m^3 for particulate discharge to atmosphere from dry dust handling plant, with the exception of silos, for exhaust flow >100m^3/min. Plant with flows >300 m^3/min to be fitted with continuous monitoring equipment. Discharges to be monitored and recorded.

2.6.9 Silos will be fitted with automatic protection systems. Design specification shall meet 10mg/m^3 for particulates discharge for all silo filtration plant.

2.6.10 If cement tankers are used for delivering to silos they shall be fitted with on board relief valve and filtration equipment or an alternative shall be agreed with the Engineer.

2.6.11 Roadstone coating plant shall comply with PG3/15 (2001 UK Process Guidance Note) with emission limits for particulate matter of 25mg/m^3. Waste oil shall not to be used. Arrestment

plant handling dry dust which discharges to atmosphere shall meet emissions limit for particulate matter of 50mg/m^3 for discharges with exhaust flows >100m^3/min.

2.6.12 *Dust and Quarrying activities*

The operation of the quarry should consider the following in order to reduce and control dust nuisance

- minimise the creation of dust by planning and design where appropriate e.g. by:
  - the use of conveyors rather than haul roads;
  - locating haul roads, tips and stockpiles away and downwind from sensitive receptors
  - creating 'sensitive zones' within which dust-generating activities are limited;
  - planning layout and constructing stockpiles, tips and mounds to minimise dust creation;
  - the use of a crushing and screening plant within its design capacity;
  - minimising the height of fall material and the use of appropriate chippings.
- control the escape of dust and remove dust where appropriate e.g. by:
  - enclosing conveyors, chutes, process plant, stockpiles;
  - providing dust-removal processing for plant and loading areas;
  - using sprays, mists and other dust suppressant to be approved by the Engineer;
  - fitting outlets with cyclones, wet scrubbers or filters;
  - maintenance of all plant and equipment to keep it in good working order;
  - ensuring compact, grade, surface and maintenance of haul roads;
  - fitting dust extractors, filters and collectors on drilling rigs;
  - restricting dust-generating activities to sheltered areas;
  - using windbreaks/netting screens/semi-permeable fences appropriate species of trees and shrubs to be agreed with the Engineer;
  - limiting drop heights in stockpiling, processing and loading operations;
  - fitting windboards/hoods to conveyors/transfer points;
  - reducing speeds and limit movement of vehicles, and/or using upswept exhausts
  - using water bowsers, road sweepers, sprays and vapour masts as necessary;
  - vegetating exposed surfaces (e.g. overburden mounds) appropriately in consultation with the Engineer.
  - limiting spillage and facilitating its removal by the use of hard surfaces;
  - sweeping haul roads and other dusty surfaces;
  - shaking-off dirt from vehicles and/or providing vehicle-washing facilities;
  - providing a surfaced road between washing facilities and site exit;
  - using linings (in loading chutes and lorries);
  - using closed or sheeted vehicles carrying dry material.
- temporarily suspend activities if unacceptable levels of dust cannot be avoided;

2.6.13 *Dust and Terrestrial and Marine Ecology*

2.6.13.1 With respect to the airport construction in Prosperous Bay Plain (PBP) any proposed use of dust suppressants other than water (of low salinity), will be reviewed by the Engineer. Use of such suppressants in the lateral safety strips of the runway and the Runway End Safety Area (RESA), where some reinstatement of the desert ecosystem is feasible and desirable, shall not be permitted. For works in these areas and where freshwater supplies for damping down is limited, other dust control methods should be used, such as physical barriers including a series of dust screens along the western edge of the airport footprint, appropriately modified plant and machinery and strict working practices to minimise dust emissions.

2.6.13.2 Monitoring of dust shall be carried out as described in Section 2.6.2

- Wherever wildlife habitats remain alongside working areas, provision shall be made to prevent encroachment onto valuable ecological areas that are not previously defined as being required for construction. This shall include the provision of secure fencing where appropriate, including adjacent to Deadwood Plain, the Central Basin and Bottom Woods. The environmental constraints areas are shown on Figure 1 in this EMP.

- ecological measures outlined in the next stages of the EIA and planning conditions shall be incorporated into the subsequent drafts of the EMP and CEMP
- Dust and air pollution control measures, as set out in Section 2.6.3 shall be applied at all work sites to protect adjacent habitats.

2.7 TERRESTRIAL AND MARINE ECOLOGY

2.7.1 The specific requirements relating to landscape, terrestrial and marine ecology are described in Section 4 The Landscape and Ecological Management Plan. The Contractor shall include in its CEMP measures to ensure the protection of sensitive species and sensitive habitat areas.

2.7.2 A constraints map is provided (see Figure 1 in this EMP) to show protected areas around the airport development, including the reserve area of the central basin of PBP and other areas of importance for Wirebirds and landscape quality. These areas shall be protected from construction activities. No works shall be permitted in these areas without prior agreement of the Engineer and other unauthorised access that may damage the ecological interest of this area shall not be permitted.

2.8 HANDLING AND DISPOSAL OF CONTAMINATED MATERIALS (INCLUDING WASTE)

2.8.1 The Contractor shall carry out the works in such a way as to prevent, contain or limit as far as reasonably practicable any adverse impacts arising from the presence of contaminated land or material during construction activities. The Contractor shall take all necessary measures to deal with noxious and toxic materials encountered. All contaminated sites and the hazards that they present shall be identified in consultation with the Engineer prior to the commencement of work.

2.8.2 Where contaminated material is excavated, it shall be necessary to determine the concentrations of any contaminants to ascertain whether the material can be placed elsewhere on the site, or, if it is classified as an environmental hazard or as a Special Waste as defined in the UK Environmental Protection Act 1990 (as amended), the appropriate method for disposal shall be identified according to the contaminants observed. However, there are no facilities on St Helena which are able to accept excavated materials classified as giving rise to an environmental hazard, or Special Waste. It is therefore expected that the Contractor shall arrange for these materials to be taken to an appropriate disposal site and all parties will discharge their statutory obligations in relation to the normal expectations of the UK waste management Duty of Care, imposed by Section 34 of the Environmental Protection Act 1990, etc.

2.8.3 The Contractor shall make reference to the HSE publication, HSG 66 Protection of Workers and the General Public During the Development of Contaminated Land 1991, for guidance on precautions required during construction on potentially contaminated sites. In particular, the Contractor shall ensure that all reasonable precautions are taken to protect workers and members of the public from exposure to any noxious or toxic chemicals. These precautions shall include:

1. Protective clothing, including overalls, hand protection, head protection, and safety Wellington boots to be worn at all times by all authorised personnel.
2. Contact with fill materials to be avoided;
3. If skin contact occurs, the affected area should immediately be washed;
4. Shoes and boots should be cleaned off prior to leaving the site;
5. During prolonged dry periods, if there is the potential for significant dust generation in construction, the surface of the site should be damped down;

2.8.4 The disposal of waste, including any surplus spoil, should be managed to maximise the environmental and developmental benefits from the use of surplus material and to reduce any adverse environmental effects of disposal. In the absence of specific legislation for St Helena, waste materials shall be managed in accordance with current statutory guidance concerning the disposal of controlled wastes i.e. The Environmental Protection Act 1990, the Controlled Waste Regulations 1992 (as amended), the List of Wastes (England) Regulation 2005 (as amended), the Hazardous Waste (England and Wales) Regulations 2005, the Waste Management Licensing Regulations 1994 and the Special Waste Regulations 1996 so far as reasonably practicable.

2.8.5 The existing waste management facilities on the island are extremely limited. The Contractor shall prepare a Waste Management Plan, which shall include:

- Waste minimisation measures the Contractor shall put in place to reduce the production of waste at source, i.e. materials being transported to the Island and minimise waste generation whilst working on the island.
- Procedures for storage of construction related wastes during the construction period. The Contractor shall construct an appropriate storage facility for all arisings and for a variety of waste types. The facility (probably temporary) shall be used to safely store waste until the appropriate disposal route is to be used, i.e. this may be storage until transfer of materials off-island and could involve waste separation and recycling operations. The Contractor shall consider whether the likely generation of waste oils shall be treated separately from the current arrangements on St Helena. The Contractor shall consider the location of the storage facility in terms of best practice to balance/minimise waste transfer movements and footprint of the facility (e.g. the contractor may prefer to base the facility at either the construction site or in Rupert's Bay prior to off-island transfer or propose a bi-facility system).
- Contractor shall remove and dispose of waste material currently present on Prosperous Bay Plain
- Re-cycling of materials which could benefit Island resources shall be considered by the Contractor and proposals will be reviewed by the Engineer.
- Waste generated by the construction workforce shall be minimised.
- Consideration of the pressure the works will generate on existing waste management facilities. Given that it is unlikely that 100% export of waste will prove feasible the likely estimate of generated waste on the landfill (after minimisation, recycling and export) shall be presented to the Engineer. The Contractor shall also consider whether landfill upgrade works could be presented as part of their strategic waste approach.

2.8.6 When preparing the Waste Management Plan, the Contractor shall take note of the following requirements:

- All special and hazardous wastes shall be removed from the Island for disposal.
- Appropriate handling and storage procedures shall be required for all anticipated waste stream characteristics.
- Disposal mechanisms shall be assessed and managed to the point of disposal. It shall not be acceptable for example to merely 'remove' any issues to another territory which may itself have waste disposal issues without consideration of staged disposal and waste management options.
- With the exception of unsuitable, inert material from the earthworks, ideally the majority of all wastes should be removed from the island. There may be the case that a percentage of these materials would be economically useful for the Island and preclude the exploitation of other resources and/ or transportation. A management procedure for these wastes, if identified, shall be included in the Waste Management Plan.
- A strategy for dealing with the international transfer of waste materials off-island shall be presented by the Contractor.

2.8.7 The Contractor's proposals shall be assessed in the context of the EIA and EMP and the Waste Management Plan will be required to meet the Engineer's approval.

2.8.8 In the event that the Contractor wishes to arrange for any recycling of contaminated materials encountered during the construction works, then before undertaking any recycling measures the Contractor shall consult with and obtain the agreement of the Engineer. The Contractor shall obtain all necessary licences and permissions for transporting waste materials away from the island for reuse, recycling or disposal in another country.

2.8.9 Waste generated from the construction works shall be minimised by re-use and recycling where possible. Waste stored on site shall be segregated according to its type to prevent cross contamination of controlled wastes and special wastes. Separate storage facilities for waste to be recycled shall also be provided by the Contractor.

2.8.10 Waste shall be stored in covered containers to prevent dust and litter being blown out of the container.

2.8.11 Where invasive plant species are found, the Contractor shall excavate soil, to a depth agreed with the Engineer, around the edge of the plant and dispose of the material in the manner specified by the Engineer. The material shall not be reused for construction or landscaping purposes.

2.9 PROTECTION OF SURFACE WATER AND GROUNDWATER RESOURCES

2.9.1 Pollution Control

2.9.1.1 Construction works shall be managed and controlled to ensure best practices in water management and to avoid water pollution, with the objective of maintaining the quality of local surface watercourses, groundwater and coastal waters. The Contractor shall carry out the works and implement working methods devised to protect surface and groundwater from pollution and other adverse impacts including changes to flow volume and quality of existing watercourses. The site shall be managed in accordance with CIRIA Report C532: Control of Water Pollution to Existing Watercourses from Construction Sites: Guidance for Consultants and Contractors (2001). All site activities shall be carried out in accordance with current Pollution Prevention Guidance notes prepared by the UK Environment Agency.

2.9.1.2 The following guidance should be adhered to for the design and construction the works.

- PPG01 General Guide to the Prevention of Pollution.
- PPG02 Above Ground Oil Storage Tanks
- PPG03 Oil Separators
- PPG05 Works in, Near or Liable to Affect Watercourses
- PPG06 Working at Construction and Demolition Sites
- PPG07 Refuelling Facilities
- PPG08 Safe Storage and Disposal of used Oils
- PPG09 Prevention of Pollution by Pesticides
- PPG10 Highway Depots
- PPG13 High Pressure Water and Steam Cleaners
- PPG14 Marinas and Crafts
- PPG17 Managing Fire Water and Major Spillages
- PPG19 Garages and Vehicle Service Centres
- PPG20 Dewatering Underground Ducts and Chambers
- CIRIA/Environment Agency Joint Guidelines: Concrete Bunds for Oil Storage Tanks
- PPG21 Pollution Incident Response Planning
- CIRIA/Environment Agency Joint Guidelines Masonry Bunds for Oil Storage Tanks
- PPG22 Dealing with Spillages on Highways
- PPG23 Maintenance of Structures Over Water
- PPG26 Storage and Handling of Drums and Intermediate Bulk Containers
- PPG04 Disposal of Sewage Where No Mains Drainage is Available
- Pollution Prevention: Major Pipelines

2.9.1.3 The construction of any storage facilities for oils, fuels or chemicals shall be carried out in accordance with details submitted to and reviewed by the Engineer before the development is commenced. The storage facilities for fuel and oil shall comply with the UK Control of Pollution (Oil Storage) Regulations (England) Regulations 2001.

2.9.1.4 Any tanks or drums of non oil based chemicals shall be stored in accordance with the Control of Substances Hazardous to Health Regulations 2002. Storage facilities should be secure containers or compounds which shall be kept locked when not in use.

2.9.1.5 The Contractor shall take all precautions to avoid the deposition of silt or detritus in watercourses and the coastal waters. This could be by the means of settling ponds, filters or any other suitable means reviewed by the Engineer. Flow attenuation may be necessary under some circumstances. Temporary silt traps and interceptors shall be regularly inspected, emptied and maintained as necessary by the Contractor. All drainage from the site shall be directed through treatment facilities and temporary outfalls at locations to be reviewed by the Engineer. The limits shall not exceed the following:

- pH 6 - 9
- Total suspended solids 100mg/l
- Ammoniacal Nitrogen 2mg/l
- Biochemical Oxygen Demand 10mg/l
- No visible oil

2.9.1.6 No tools or equipment shall be washed in any watercourses or the sea but at designated washing areas. Wash water shall not be discharged into a watercourse, the sea or into road drains or disposed of in any other way that could result in pollution of a water body.

2.9.1.7 Surface or groundwater from excavations or other parts of the working area shall not be pumped or allowed to run directly into a watercourse, the sea or drain. Such water shall be passed through suitably sized settlement lagoons to remove silt solids before discharge to a watercourse.

2.9.1.8 Run-off and damping down water from the site shall be prevented from reaching the adjacent Areas of Environmental Constraint shown on Figure 1 in this Volume of the ES.

2.9.1.9 Prior approval shall be obtained from the Engineer for all temporary works which may interfere with the bed or banks or flood plains of any watercourse or within 8 metres of the bank of any watercourse.

2.9.1.10 No vehicle or any item of plant or equipment shall be used in watercourses or costal zone or the sea unless required for specific operations Where machinery is unavoidably required to work within a waterbody the individual item of plant concerned shall be clean and free from oil leaks, and shall be agreed with the Engineer.

2.9.1.11 A direct discharge from Batching Plant to a watercourse or coastal water is not permissible and recirculation or other methods of management of discharge is required.

2.9.1.12 Where possible rubber tyred vehicles rather than those with tracks shall be used for works required within watercourses.

2.9.1.13 The Contractor shall provide, install and remove temporary culverts and bridges to allow vehicles to cross watercourses and to prevent disturbance of the bed of the watercourse. Such temporary works shall prevent mud from vehicles contaminating the watercourse.

2.9.1.14 Where banksides of watercourses are disturbed, the Contractor shall reinstate these areas to the Engineer's requirements in accordance with the Conditions of Contract.

2.9.1.15 The Contractor shall ensure that any proposed drainage schemes and discharges from equipment (including the concrete and asphalt batching plants) required for the construction of the airport and haul/access roads are agreed in advance with the Engineer.

2.9.1.16 In planning and carrying out any construction works, precautions shall be taken to ensure the protection of watercourses and water in underground strata against pollution. The findings of any ground investigation of sites where past use of the site has indicated the

potential for contamination shall be considered to ensure that suitable mitigation measures are applied where contaminated land may be disturbed.

2.9.1.17 The Contractor shall implement a training programme to ensure that all site staff are aware of the risks of site activities to the water environment.

2.9.1.18 If any pollution occurs, then the Contractor shall advise the Engineer immediately and take prompt action to minimise the effect. A procedure shall be put in place to ensure an effective response to a pollution incident. This shall be agreed with the Engineer in advance of the commencement of any works. The Contractor shall have in place a procedure and sufficient supplied of materials at key locations around the site to contain and clean-up all spillages or leak of polluting material.

2.9.1.19 A common cause of pollution from sites is through vandalism. The Contractor shall prevent unauthorised persons from gaining access to the site.

2.9.1.20 In order to limit pollution from silt and cement and other pollutants, the Contractor shall ensure the following measures are followed:

1. The washwater from concrete mixing plant, or the cleaning of ready mixed concrete lorries shall not be allowed to flow into any drain, watercourse or coastal waters. Washings shall be contained in sealed units for disposal at a location to be agreed by the Engineer.
2. Site roads shall be regularly swept or scraped and kept free from deposits in order to prevent silt, oil or other materials entering any drain or watercourse.
3. Any wheel wash facilities shall be securely constructed with no overflow and effluent shall be contained for proper treatment and disposal.
4. Before any discharge of water is made from the site, adequate provisions, such as settlement lagoons or silt traps fitted with oil absorbent booms, shall be made to ensure that pollution shall not occur.
5. Prior to being discharged all surface water drainage from impermeable parking areas, roadways and hardstandings for vehicles shall be passed through an oil interceptor designed and constructed to have a capacity and details compatible with the site being drained.

2.9.1.21 In order to prevent pollution from oil, fuel and chemicals and in addition to the pollution control measures relating to fuel storage described in sections 2.9.1.3 above the following shall be implemented:

- Filling and refuelling shall be strictly controlled and together with any oil storage tanks, should be confined to a location remote from any watercourse, drain or the sea.
- Leaking or empty drums shall be removed from the site immediately and stored in a manner which shall prevent pollution prior to disposal.
- Before any tank is removed or perforated, particularly during demolition works, all contents and residues shall be identified for safe disposal. Pipes which may contain significant quantities of oil or chemicals, shall be capped, or valves closed to prevent spillage.
- All diesel/petrol powered pumps and generators and other static plant shall be placed on impervious drip trays and positioned away from any watercourse or drain. Drip trays shall be regularly maintained.

2.9.2 Abstraction and Use of Water During Construction

A number of requirements shall apply to the Contractor when abstracting and using water during construction. These are general and site specific requirements which relate both to the potential source and use of water on site. The requirements relate to the currently known potential sources of water which are from an abstraction point in Sharks Valley Point A1/A2 and at the waterfall nearest the beach and the possible use of sea water in specific areas of the core of the embankment in Dry Gut. These are described under the following headings:

- General requirements for the use of water on site
- Conditions under which sea water could be used in the construction of the embankment in Dry Gut
- Residual flow that should remain in the stream at the waterfall abstraction point in Shark's Valley
- Requirements for the Contractor should he wish to abstract from a source other than Sharks Valley at the waterfall

2.9.2.1 General requirements for the use of water on site

The Contractor must make every effort to minimise the use of water on site. Wherever, possible he should reuse water and store water for use during periods of peak demand.

2.9.2.2 Conditions under which sea water could be used in the construction of the embankment in Dry Gut

- Sea water shall only be used for the core of the Dry Gut embankment provided the Contractor can demonstrate that salt will not migrate to the surface of the land or groundwater. The surface includes the surface at the airfield, the outer layers of Dry Gut embankment, the benches and terraces of Dry Gut embankment, Prosperous Bay Plain and Dry Gut Valley. As a further precautionary measure, if sea water is to be used in the core of the embankment the following should apply:
  - Use of sea water shall be restricted to the core of the embankment structure in Dry Gut and shall not be used in any other area of construction across the Site.
  - either dry compaction or use of fresh water shall be used for the outer layers at all levels across the embankment. An appropriate depth would be determined following further investigation by the Contractor and in consultation with the representatives from the Employer's Environmental Consultants and agreed with the Engineer.
- During construction of the embankment, releases (fugitive or direct losses) of saline water shall be tightly controlled in order that any releases to the valley/gut down stream, the surrounding area core embankment, within or around the gut or to groundwater are prevented. A method statement shall be produced by the Contractor and agreed with the Engineer prior to construction commencing.
- Any infrastructure, plant and equipment in place and used for the abstraction and/or application of sea water shall be well maintained and must not cause leaks of sea water to the surrounding land or freshwater.
- Appropriate measures to protect the marine environment at the point of abstraction shall be put in place. These shall include noise attenuation to minimise disturbance to sea birds, pollution control measures and measures to prevent direct effect and minimise disturbance to marine biota.
- When decommissioning any infrastructure, plant and equipment used for the abstraction and/or application of sea water the item shall be drained in a controlled manner which prevents discharge of sea water to the land or freshwater. Before equipment that has been used to handle sea water is to be used for freshwater application or transfer it should be purged of all traces of sea water in a controlled manner.
- The design of the abstraction facility at Gill Point and the route of the pipeline shall be developed in conjunction with the Engineer in order that the ecological, landscape and recreation sensitivities and requirements are accommodated in the design. All areas affected by these temporary structures shall be fully reinstated in compliance with Section 4 below, Landscape and Ecological Requirements .

2.9.2.3 Residual flow that should remain in the stream at the waterfall abstraction point in Shark's Valley

There are 11 flow measurements that have been undertaken by PWSD at the waterfall in Sharks valley between the period November 2006 and April 2007. Three of these measurements record the flow as 648m^3 per day, the other eight are 518m^3 per day. This suggests very limited variability in the flow observed at the waterfall and does not lend itself to calculation of a low flow statistics that could be used as a hands-off flow. The quality of the data is unknown.

The reduction in water volume and flow rates is unlikely to cause the permanent loss of any plant species. It may hasten the spread of the alien invasive wild mango, which as well as enjoying moist situations is also drought tolerant, over the water loving and more dependent species, like the *Scirpus* and wild celery. Controlling the spread of wild mango may be necessary as part of ecological reinstatement works.

The Contractor shall maintain a record of the volume of water abstracted from the water supply sources used for potable supply and for construction purposes. A sampling programme should be established to monitor the quality of any discharges of effluent to ground or surface waters.

If water was abstracted from Point A1/A2 and/or the waterfall it would be necessary to introduce a number of mitigation procedures so as to manage the risk posed to the environment. It is advised that measures shall apply such as

- Up to 40m^3 per day may be abstracted from Point A1/A2 in Sharks Valley
- Should water be abstracted from the waterfall, as a guideline, the Contractor must leave in the stream, at least 138m^3 per day (a figure equivalent to just over a quarter of the flow based on current data)
- using alternative sources of water to supplement Sharks Valley
- build storage ponds to develop a store of water prior to construction starting
- Improvements to the path would be required if the pipeline is to follow path, above or below ground it would need to be wide enough for walkers to use without trip hazard.
- The design of the abstraction facility at the waterfall and the route of the pipeline shall be developed in conjunction with the Engineer in order that the ecological, landscape and recreation sensitivities and requirements are accommodated in the design. All areas affected by these temporary structures shall be fully reinstated in compliance with the Section 4 below, Landscape and Ecological Requirements
- More detailed ecological assessment of the existing situation followed by regular monitoring.
- identify key areas where plant species should be protected and investigate damming the stream to create ponds/wet/flowing areas along the river that would sustain these communities
- undertake selective vegetation clearance to limit demand for water in these areas
- manage potential for invasion/spread of wild mango and other drought resistant species

2.9.2.4 Requirements for the Contractor should he wish to abstract from a source other than Sharks Valley at the waterfall and A1/A2

General Points Applicable to both Surface Water and Groundwater

- An impact assessment of any new abstractions proposed, even if only temporary for the duration of the construction works will need to be provided.
- If effluent from sewage treatment ponds is to be used, agreement of acceptable nutrient content of the water shall be required in order to prevent the spread of invasive species. Although quantities available are very limited/unreliable.
- Landscape and visual considerations should be taken into account when selecting the route for any new buried mains. Key landscape features should be avoided such as ridgelines, rocky outcrops, endemic plants and areas of woodland. Where reinstatement is required suitable species and densities shall be identified.
- Any new permanent pipelines required to transfer water should be buried and not above ground. The pipelines should be routed to minimise the requirement for any above ground sections whilst taking into consideration the landscape and ecological requirements.

- Appraisal of the existing vegetation associated with any of the watercourses where abstraction is being considered should be undertaken in order to establish the potential impact on the ecology of the watercourse and potential loss of visual/scenic amenity.

Groundwater Abstractions

- The potential impact of any new abstraction on other water features, such as springs, other boreholes, sensitive water features and hydro-ecology downstream needs to be considered.
- A hydrogeological assessment will be needed to determine the relationship between groundwater and other water features in the area.
- A yield drawdown analysis will be required for any new boreholes to establish the maximum deployable yield.

2.10 THE MARINE ENVIRONMENT

2.10.1 The specific requirements relating to marine ecology are described in Section 4 below, Landscape and Ecological Requirements. The Contractor shall include in its CEMP measures to ensure the protection of sensitive marine species and habitat areas.

2.10.2 The Contractor shall prepare procedures for protection of the marine environment including prevention of contamination from suspended solids and any discharge of fuels, mineral oils and chemicals associated with malpractice or accident. It shall also include measures to minimise the disturbance to businesses and users of the amenity area and beach at Rupert's Bay.

2.10.3 The Contractor shall be required, before commencement of any works, to set out a construction methodology, taking into consideration the mitigation requirements set out in the EMP and the findings of subsequent stages of the EIA, for the undertaking of works in, and adjacent to the marine environment. This statement of construction methodology shall be agreed with the Engineer and the appropriate SHG Departments, including ANRD, consulted in advance of any works.

2.10.4 The pollution prevention measures described to protect the surface water and groundwater resources shall also be applied when working within Rupert's Bay, Prosperous Bay, and Dry Gut Bay/ Gill Point should any works be required within Prosperous Bay and/or Dry Gut Bay/ Gill Point.

2.10.5 Construction works shall be undertaken according to the principles of good practice outlined in the UK Environment Agency guidance on the prevention of pollution during construction and operation described in Section 2.9.

2.10.6 The Contractor shall undertake daily inspections of the working area both along the shore and in the marine zone. The Contractor shall carry out routine monitoring of the water quality during relevant construction activities. During subsequent stages of the EIA a trigger level for suspended solids may be set to retain the quality of the marine environment in the vicinity. For the purpose of the Stage 1 EMP the trigger level shall comprise visible signs of turbidity or discolouration. If the trigger level is exceeded, action shall be taken on the construction site to determine the cause, and take steps to resolve the problem. The Contractor shall be responsible, in consultation with the Engineer and relevant SHG Departments, for formulating a procedure to be adopted in the event of unacceptable sediment loadings.

2.10.7 Marine mitigation shall include the following:

- Subject to the source and nature of material, quarried rock shall be washed prior to transport should it be deemed necessary by the Engineer.
- Sediment traps and/or silt curtains shall be incorporated into the construction process of the jetty to prevent silt escaping from the working area.

2.10.8 The Contractor shall minimise the footprint of his working area within the coastal zone.

2.10.9 The wharf shall be designed so as to avoid any land take and adverse impacts on Rupert's beach and amenity area. The design shall avoid disturbance of the Boer prisoner of war desalination chimney and minimise direct effects on Rupert's lines (the fortification wall). Further information regarding the desalination chimney is provided in Section 2.12. The design shall minimise adverse effects on water quality and the marine and coastal ecology.

2.11 SITE BOUNDARIES/HOARDINGS/TEMPORARY STRUCTURES ON THE PUBLIC HIGHWAY

2.11.1 The provision of gates in the fencing or hoarding shall, as far as practicable, be positioned and constructed to minimise the noise transmitted to nearby noise sensitive buildings from the work site direct or from plant entering or leaving the site.

2.11.2 Any security/intruder alarms provided by the Contractor shall be designed and operated so as not to cause a nuisance to local residents or businesses.

2.11.3 The Contractor shall ensure that all graffiti or defacement to the hoardings are removed and made good as soon as reasonably practicable.

2.11.4 There shall be provided at each enclosed work site an information board detailing the site programme, together with telephone contacts (including an emergency telephone number) for use by members of the public who wish to lodge complaints or comments.

2.11.5 Any fenced storage areas, scaffolding gantries, loading/unloading bays, waste containers and other temporary structures on the public roads provided by the Contractor shall be maintained by the Contractor to the satisfaction of the Engineer and in consultation with PWSD.

2.11.6 Where it is essential for the Contractor to use lighting during night time works the Contractor shall ensure that construction buildings, equipment and lighting are sited so as to minimise visual intrusion to local residents, consistent with the efficient operation of each work site.

2.12 ARCHAEOLOGICAL REMAINS

2.12.1 Measures to be addressed in the scheme of archaeological mitigation will be defined during the subsequent stages of the EIA. These will include the field investigation and recording work, although where possible these will be considered in advance of the appointment of the Contractor. The feasibility of dismantling the Boer prisoner of war desalination chimney and reconstructing it elsewhere will be considered during the EIA. If this is feasible it would be carried out in accordance with a method agreed with the Engineer. The methodologies adopted for various stages of the work will be informed by the Institute of Field Archaeologists Standards and Guidance documents.

2.12.2 The Contractor, prior to commencement of any construction work, shall submit to the Engineer a scheme for archaeological mitigation, for approval, setting out the proposed measures to be taken to prevent damage to known and unknown archaeological remains. Upon commencement of the construction work, the reviewed statement shall be implemented and complied with throughout the period of the construction work. Known features are presented on Figures 11.1a to 11.1E in Volume 3 of the Environmental Statement and described in Chapter 11 of Volume 2 and Appendix 11.1 of Volume 4 of the Environmental Statement. The Contractor shall safeguard area and features to be protected/undisturbed during the construction works.

2.12.3 The Contractor shall be aware of the possibility of uncovering items or areas of archaeological interest during top soil and sub soil stripping. The Contractor shall take all reasonable precautions to prevent his workmen or any other persons from removing or damaging any fossils, coins, articles of value or antiquity, structures or other remains, or any

other item of archaeological interest discovered. Items found shall be handled in accordance with the Conditions of Contract.

2.12.4 The Contractor shall prepare procedures to ensure that existing features of archaeological importance to be retained shall be protected from damage and disturbance.

2.12.5 Should it be necessary to conduct a watching brief during soil stripping and ground disturbance work in specific areas the Contractor shall provide adequate access and time for this to be carried out by the Museum Curator.

2.13 BUILT HERITAGE

2.13.1 The Contractor shall carry out the works in such a way as to protect, conserve, enhance or minimise the impact on historic buildings (including Listed Buildings), historic areas (including Conservation Areas) and their settings. The location of listed buildings and conservation areas is shown on Figures 11.1a to 11.1E in Volume 3 of the Environmental Statement and described in Chapter 11 of Volume 2 and Appendix 11.1 of Volume 4 of the Environmental Statement. The Contractor shall submit to the Engineer a statement, setting out the proposed works, methods to be used and measures to be taken, with respect to historic buildings and areas. This statement shall include specialist monitoring measures. Any such statement shall be reviewed by the Engineer and the relevant Department of SHG prior to the commencement of work at the site(s) to which the statement relates.

2.13.2 Upon commencement of the construction work any relevant statement shall be implemented and complied with throughout the construction period. The advice given in Planning Policy Guidance Note 15 and British Standard 7913: Guide to the Principles of Conservation of Historic Buildings shall be followed. The Contractor shall also comply with the Land Planning and Development Control Ordinance 2001 and the St Helena Land Development Control Plan.

2.13.3 The Engineer will ensure that all necessary consents (including planning, listed building and conservation area) are obtained before the start of the relevant part of construction, and that the Contractor shall comply with the requirements stipulated in any consents and the conditions therein.

2.14 OTHER SITE ACTIVITIES

2.14.1 The Contractor shall ensure the following general requirements are met in relation to the construction works:

1. Smoking areas shall be provided at suitable locations as far as is practicable. Smoking shall not be allowed at any location below ground level.
2. Rubbish shall be removed at frequent intervals and each work site kept clean and tidy.
3. Toilet facilities shall be provided and kept clean.
4. Food waste shall be contained and removed at least weekly.
5. Wheel washing facilities shall be brushed clean at frequent intervals.
6. Detailed daily records shall be kept of climatic conditions including rainfall, minimum and maximum temperatures, humidity and wind direction.
7. Records of construction plant used on the site shall be drawn up at weekly intervals.
8. All necessary measures shall be taken to minimise fire risks and the Contractor shall comply with the requirements of the St Helena Fire Service.
9. Radios (other than two-way radios for the purposes of communication between operators of the contract) and other forms of audio equipment shall not be permitted on any work site in a populated area.

2.14.2 As far as possible construction compounds including construction workforce camps and temporary accommodation work areas and material storage and handling areas shall be designed and located in areas which would cause the least disturbance to existing land uses and minimise extent of land take.

2.14.3 The Contractor shall not allow any temporary living accommodation outside the workers' camp enclosure on site except with the prior consent of the Engineer. Portable mess rooms, locker rooms, toilets and showers are permitted.

2.14.4 At each work site all vehicles shall enter and exit in a forwards direction except where space restrictions do not permit this. In that event movement shall be properly controlled by a responsible person(s) observing the rear of the vehicle i.e. a Banksman.

2.14.5 Where appropriate, in populated areas, the Contractor shall provide suitable lighting to the site boundaries with illumination sufficient for the safety of the passing public including mobility impaired people. Site lighting shall be designed, positioned and directed so as not to unnecessarily intrude on passing drivers on roads, and having due regard to residential premises neighbouring the site.

2.14.6 The Contractor shall prepare emergency procedures to be implemented in the event of an environmental incident such as a breach of a limit or an accidental spillage.

2.14.7 All plant and equipment brought to the island for the purpose of construction of the airport and supporting infrastructure shall be removed from the island on completion of the works unless, by agreement with the Engineer and Employer, it is transferred to the Employer or another party.

3 General Matters Applicable to Operation Under the EMP

3.1 INTRODUCTION

3.1.1 The CEMP shall include a chapter describing the procedures to be implemented during the operation period. This chapter shall be developed during subsequent stages of the EIA prior to and following the application for Development Permission.

3.1.2 The Contractor shall assist the Airport Director in preventing pollution of air, land, surface water, groundwater and sea. This includes preventing the introduction of non-native species, pests and other disease that could be transmitted by cargo and/or livestock.

3.1.3 It shall operate in a manner which:

- does not create a nuisance to community, in terms of noise, vibration and general amenity.
- shall ensure that it does not cause degradation of the biodiversity of the surrounding area.
- shall comply with the regulations and guidance prevailing at the time and adhere to the conditions attached to the Development Permission.

3.1.4 As set out in the Employer's Requirements: Volume 3c - Technical Specification for Operational Services (Phase 2) the Contractor shall, within 12 months of the Commencement Date, implement an environmental management system (EMS) compatible with ISO 14001:2004 Environmental Management or an agreed equivalent.

3.1.5 The Contractor shall also prepare a Sustainable Development Policy which shall integrate its operations with the St Helena Government's policy and strategy on sustainability as it develops. The Contractor, in designing its service delivery models shall demonstrate an integrated approach to sustainable development with regard to SHG's Sustainable Development Policy. This shall take into account, but not be limited to, the following:

- Conservation – energy, wood, paper, horticulture, water;
- Pollution – climate change, ozone depletion, vehicle emissions, biocides and artificial fertilisers, asbestos, hazardous substances, batteries, solvents, paints, bio-degradables & litter;
- Procurement;
- Monitoring and auditing.

3.2 ROADS AND FOOTPATHS

3.2.1 The Contractor shall prepare a Traffic Management Plan for the operation of the Airport.

3.2.2 SHG will ensure that during operation, traffic will be encouraged to use the new access route and measures to prevent traffic from accessing the airport via the existing road network in Longwood will be put in place by the Employer.

3.2.3 The coastline to the east of the airfield is an important amenity resource and there are a number of features of natural and heritage interest to which permanent access by the public is required, these include the Signal Station, Gill Point, King and Queen Rocks and the coastline generally, which is used for fishing. The Contractor shall avoid permanent footpath closures by providing suitable diversions to the north and South (along the Dry Gut embankment) of the airfield.

3.3 NOISE

3.3.1 Where required the Contractor shall adopt noise mitigation procedures for aircraft taking off and landing. Engine running on the terminal apron shall be kept to a minimum compatible with the flight schedules.

3.3.2 Auxiliary power units and ground support vehicles shall be maintained in good working order.

3.4 TERRESTRIAL AND MARINE ECOLOGY

3.4.1 The requirement is for the management of terrestrial ecology are specified in Section 4 - the Landscape and Ecological Requirements.

3.4.2 The procedures described in sections 2.9 and 2.10 shall apply to all operation and maintenance works.

3.5 HANDLING AND DISPOSAL OF WASTE

3.5.1 The existing waste management facilities on the island are extremely limited. Waste shall be managed in accordance with the approved Waste Management Plan for operations. In the absence of specific legislation for St Helena, waste materials shall be managed so far as reasonable and practicable in accordance with current statutory guidance concerning the disposal of controlled wastes in the UK, i.e. The Environmental Protection Act 1990, the Controlled Waste Regulations 1992 (as amended), the List of Wastes (England) Regulation 2005 (as amended), the Hazardous Waste (England and Wales) Regulations 2005, the Waste Management Licensing Regulations 1994 and the Special Waste Regulations 1996 shall apply.

3.5.2 There are no facilities on St Helena which are able to accept materials classified as giving rise to an environmental hazard, or Special Waste. It is therefore expected that the Contractor shall arrange for these materials to be transferred to a suitable disposal site and all parties (Including the Contractor, waste carrier and recipient) shall discharge their statutory obligations in relation to the normal expectations of the UK waste management Duty of Care, imposed by Section 34 of the Environmental Protection Act 1990, etc., so far as reasonably practicable.

3.5.3 The Contractor shall provide and maintain a fully documented policy covering all the necessary functions and facilities for the collection, handling, holding, transportation and ultimate disposal of all waste generated on or around the airport. In this regard the Contractor shall develop and maintain a comprehensive Waste Management Plan for Operations that shall include:

- Duties and Responsibilities
- Materials and equipment to be used in handling waste
- Waste audit trail from the point of origin to final disposal, as appropriate to the grade of waste.
- Segregation and storage procedures for different waste types
- Labelling of different wastes and collection containers
- Procedures for Hazardous Wastes
- Safety and care when handling waste
- Waste minimisation measures
- Recycling procedures
- Minimising the environmental impact of waste
- Transportation and Disposal procedures

- Training of relevant staff
- Interface issues with airline operators.

3.5.4 The Contractor shall ensure that the General Waste produced at the airport is effectively minimised and that the collection and handling of waste is undertaken safely and effectively in a manner that prevents unsightly build-up.

3.5.5 Waste shall be held in containers in a secure area where any spillages shall be contained and arrangements put in place to ensure the regular removal from the site and appropriate disposal.

3.5.6 Disposal of Chemical, Oil and Fuel Wastes

3.5.6.1 The Contractor shall segregate all wastes containing chemicals, oils or fuels and shall ensure their safe disposal in strict compliance with the Waste Management Plan.

3.5.6.2 The Contractor shall contain any waste that includes oils, fuels or chemicals so as to prevent any contaminants leaching out into the environment. Disposal of these wastes shall be undertaken strictly in accordance with the agreed Waste Management Policy and shall include for:

- The clear labelling of drainage systems and mapping connections
- Storing chemicals, fuels and effluent in areas where spillage shall be contained
- Training employees in handling techniques and spillage control
- Isolating clean surface water run-off from general drainage
- Using drip trays under equipment
- Providing suitable spill kits and absorbent materials
- Regular cleaning of interceptors.

3.5.7 Disposal of Hazardous Waste

3.5.7.1 The Contractor shall provide for special procedures for the disposal of Hazardous Wastes (i.e. waste that has properties that may render it harmful to human health or the environment – see the Hazardous Waste (England and Wales) Regulations 2005,). The Contractor shall undertake the disposal of Hazardous Wastes in accordance with the specific requirements for each type of waste. These shall include, inter alia:

- Lead-acid batteries
- Electrical equipment containing hazardous components
- Solvent-based inks and paints
- Waste oils
- Pesticides
- Acids

3.5.7.2 The Contractor shall identify those wastes that become classified as hazardous when they contain substances over specified thresholds (see the List of Wastes (England) Regulation 2005 (as amended), the Hazardous Waste (England and Wales) Regulations 2005,).

3.5.7.3 In any of these instances, the Contractor shall:

- Provide storage in appropriate secure, accessible containers
- Inspect containers at least once a week
- Maintain a procedure for handling spillages
- Train staff in procedures to handle hazardous waste
- Keep an inventory of stored hazardous waste
- Ensure handling and transportation is undertaken in accordance with SHG Regulations
- Maintain an audit trail of consignment notes for at least three years
- Ensure recovery or disposal of waste is undertaken by authorised persons.

3.5.8 *Recycling of Waste*

3.5.8.1 The Contractor shall put in place policies and actions to minimise the amount of waste produced and to maximise the segregation, re-use and recycling of waste from the airport. The Contractor shall put in place the means of segregating waste for re-use or recycling, either at source or through a waste separation process, appropriate to the facilities available on the island. The Contractor shall liaise with the airlines to ensure that the maximum amount of re-use is made of containers and packaging used by the aircraft operators.

3.5.9 *Sewage Treatment*

3.5.9.1 The Contractor shall provide for the effective collection, disposal and treatment of all sewage wastes generated by the airport. The Contractor shall be responsible for all sewage waste disposal including:

- Collection
- Pumping and transportation
- Treatment
- Disposal

3.5.9.2 In accordance with the Employer's Requirements Volume 3b Section 4 Drainage the final effluent shall be treated to an acceptable standard. Methods for handling and disposal of the products of treatment such as sludges and screening should be identified in the Waste Management Plan.

3.6 SURFACE WATER AND GROUNDWATER RESOURCES

3.6.1 The Contractor shall prevent pollution of surface waters and groundwater. He shall not cause or knowingly permit the entry into surface waters or groundwater of solid waste matter, or of poisonous, noxious or polluting matter. The drainage system and receiving watercourses shall be routinely inspected and maintained to ensure the effective operation without deterioration in the quality of the surrounding environment both in terms of quality and form of the channel, bed and banks.

3.6.2 Any works which have the potential to affect the groundwater, channel, bed and banks of a watercourse shall be reviewed in advance by the Airport Director in consultation with the relevant Departments of SHG, including PWSD, ANRD and the ECO.

3.6.3 The Contractor shall have in place a procedure and sufficient supplies of materials and equipment to contain, clean-up a spillage or leak of polluting material.

3.6.4 The following conditions shall apply to the abstraction of water for potable supply from the source in Sharks Valley at Point A1/A2:

- Up to 40m^3 per day may be abstracted from Point A1/A2 in Sharks Valley
- The design of the abstraction facility A1/A2 and the route of the pipeline shall be finalised in conjunction with the Engineer in order that the ecological, landscape and recreation sensitivities and requirements are accommodated in the design. All areas affected by these temporary structures shall be fully reinstated in compliance with the Section 4 below, Landscape and Ecological Requirements.
- The Contractor shall maintain a record of the volume of water abstracted from the water supply sources used for potable supply and for construction purposes. A sampling programme should be established to monitor the quality of any discharges of effluent to ground or surface waters.
- The same requirements set out in section 2.9.2.4 shall apply to the Contractor should he wish to abstract from a source other than Sharks Valley at Point A1/A2.
- It is desirable to maintain a minimum flow of 260m^3/day at A1/A2. The Contractor may apply to the Engineer to abstract beyond this level if required to do so in order to meet his

40m^3 per day abstraction limit. Any such application shall be accompanied by an assessment of likely downstream impacts. In consultation with the Engineer works are required to ensure that the natural environment further downstream was not irreversibly damaged. These include the following:

- More detailed ecological assessment of the existing situation followed by regular monitoring.
- Identify key areas where plant species should be protected and investigate damming the stream to create ponds/wet/flowing areas along the river that would sustain these communities.
- Undertake selective vegetation clearance to limit demand for water in these areas.
- Manage potential for invasion/spread of wild mango and other drought resistant species.

3.7 THE MARINE ENVIRONMENT

3.7.1 The procedures described in sections 2.9 and 2.10 above shall apply to all operation and maintenance works

3.7.2 The Contractor shall prevent pollution of marine waters. He shall not cause or knowingly permit the entry into marine waters of solid waste matter, or of poisonous, noxious or polluting matter.

3.7.3 The Contractor shall have in place a procedure and sufficient supplies of materials to contain, and clean-up any spillage or leak of polluting material suitable for use in a marine environment.

4 Landscape and Ecological Requirements

4.1 INTRODUCTION

NOTE – this section should be read in conjunction with Appendix 10.2 - The Landscape and Ecological Mitigation Plan (LEMP) in Volume 4 of the ES. The LEMP provides additional detail regarding the mitigation requirements. Figures 10.7 (sheets 1 to 6) in Volume 3 of the ES accompany the LEMP.

4.1.1 The detailed landscape and ecological mitigation requirements will continue to be developed in parallel with the completion of the EIA and refinement of the design in order that impacts can, wherever possible, be mitigated through avoidance, reduction or compensatory measures. A preliminary approach to mitigation has therefore been developed based on the reference design provided with the Employer's Requirements.

4.1.2 In many areas, refinement will be needed in response to both further work on ecological and landscape assessment and in response to a greater level of design detail which will be provided by the Contractor.

4.1.3 The landscape and ecological mitigation requirements have been divided into three main sections:

- **Airport Related Works** – works which the Contractor **shall** undertake.
- **Project Related Works** – works which will be implemented as part of the mitigation requirements of the Access Project but are **not** required to be undertaken by the Contractor.
- **Long Term Landscape and Ecological Management Projects for the Island** – works which are **not** required to be undertaken by the Contractor but are an important part of the long term management of compensation measures for the Access Project.

4.1.4 The Contractor shall refer to the EIA Stage 1 report for further details on landscape, terrestrial and marine ecology baseline and the rationale behind the mitigation commitments.

4.2 AIRPORT RELATED WORKS

(works which the Contractor **shall** undertake)

4.2.1 Control of Non-native Species

4.2.1.1 St Helena, as with many small islands, has suffered ecological and economic damage from the introduction of non-native species of plant and animal and from land-use practices that are inimicable to the island's ecology. The following are key requirements in this respect.

4.2.1.2 New plant material shall be protected from damage by mice and rabbits and a control programme for these species within the airport site shall be initiated in advance of all planting.

4.2.1.3 The use of insecticides in the Central Basin shall be strictly prohibited along with those areas immediately adjacent to the Central Basin. The extent of the area where insecticides shall be prohibited shall be agreed with the Engineer.

4.2.1.4 Outwith the identified areas and only with the permission of the Engineer and only after other forms of pest control have been thoroughly investigated and proven to be unsuitable, inappropriate or to have failed, shall insecticide use or other chemical treatments for the control of pest species be permitted. When required, only target selective insecticides or other chemical treatments agreed with the Engineer shall be permitted and only after successful restricted and controlled trials have been undertaken. A detailed method statement shall be provided and reviewed by the Engineer prior to the use of any such substances.

4.2.1.5 Insecticide use and other chemical treatments for the control of pest species shall be carried out following manufacturers and best practice guidelines in order to reduce the impact of inadvertent contamination of adjacent areas. No containers of insecticide or other chemical treatments shall be permitted into those areas where the use of such items is prohibited.

4.2.1.6 Use of herbicides shall not be allowed other than when eradicating invasive species where prior agreement with the Engineer shall be required. Hand weeding and use of mechanical tools in certain locations (subject to agreement with the Engineer) shall be the preferred mechanism of weed control.

4.2.2 Environmental Constraints

4.2.2.1 Figure 1 in this EMP identifies the environmental constraints across the Site, including but not limited to the central basin of PBP noted by Ashmole and Ashmole (2004) to be of key importance for endemic invertebrates. The Contractor must undertake works within the defined Site boundaries.

4.2.2.2 Where there is risk of unauthorised access by vehicles and site personnel, the protected areas identified on Figure 1 in this EMP shall be protected by temporary fencing from construction activities and other unauthorised access that has the potential to damage the ecological or landscape interest of the area.

4.2.2.3 Vehicles shall be prohibited from entering the protected areas other than on the designated access roads.

4.2.2.4 The Contractor shall agree with the Engineer prior to commencement of the works a procedure to carry out any agreed works within sensitive ecological areas or areas which may cause disturbance to species of importance. Authorisation to proceed with the activities will only be granted provided that the Engineer is satisfied that the Contractor will implement adequate precautions to prevent damage and disturbance.

4.2.2.5 The Contractor shall be aware that he may disturb sedimentary deposits that may contain fossil species e.g. bird bones, invertebrate remains, that may provide further clues as to the early evolutionary history of native and endemic wildlife on St Helena. Should any such items be found they shall be handled in accordance with the Conditions of Contract.

4.2.2.6 In programming the works, the Contractor shall take full account of the constraints imposed by the existing species and habitats on or adjacent to the Site.

- The onset of any works requiring vegetation clearance, ground disturbance, storage of materials, construction or other works that may destroy Wirebird nests and eggs shall be undertaken between 1st March and 30th September, outside the peak breeding season for Wirebird. The Employer will seek the appropriate specialist advice regarding suitable methods for discouraging Wirebirds from nesting within the works sites once they have been cleared in preparation for construction activity.
- Sites for Wirebird including PBP, Deadwood Plain and Bottom Woods sites, are identified on Figure 1 in this EMP and also on Figure 9.6 in Volume 3 of the ES.
- The discovery of any nesting Wirebirds shall be reported to the Engineer.

4.2.3 Requirements in Respect of Reinstatement Works

4.2.3.1 Within all parts of the Contractor's works or immediate corridor of influence (i.e. adjacent to the haul/access road), the Contractor shall be responsible for the landscape and ecological mitigation comprising establishment of native vegetation and a weed eradication programme. This shall also include a 2 year defect period during which the Contractor shall be responsible for protecting, maintaining and making good any defects of the landscape and ecological habitat and reinstatement work.

4.2.3.2 As described in the Employer's Requirement Volume 3a, Section 1.7 Interface with Other Contractors the Contractor shall coordinate closely with those undertaking the compensatory planting and habitat management works and shall where necessary facilitate these works.

4.2.3.3 The Contractor shall use the seeds, plant and soil substrate material identified in Section 4.3.2.2 for all planting associated with the landscape and ecological reinstatement works. The plant species which the Contractor shall use are identified in Table 4.1 and shall be planted to mimic natural mixes and densities. Distribution and density of re-establishment planting shall be agreed with the Engineer during detail design.

4.2.3.4 The following table (Table 4.1) identifies the proposed indigenous plant species ("+" endemic) for planting/seeding of all areas of reinstatement and compensatory habitat associated with the Access Project. When establishing plant mixes, consideration shall be given to habitat requirements in relation to substrate types, soil chemistry such as salinity or phosphate concentrations and exposure conditions.

Table 4.1 Proposed indigenous plant species ("+" endemic) for planting/seeding of areas associated with the airport and supporting infrastructure.

Species	Common name	Plant form	Habitat Notes
Airport and surrounding area including all re-graded and landformed areas, Dry Gut, Prosperous Bay Gut			
Suaeda fruticosa	Samphire	Low spreading shrub	Arid areas, host plant for endemic insects
Hydrodea cryptantha +	Babies toes	Succulent annual	Arid areas & intermittent rain water formed water channels, endemic insects associated
Commidendrum rugosum +	Scrubwood	Perennial low growing shrub	Condensation zones, possibly the former dominant species in present creeper zones, host plant for endemic insects
Frankenia portulacifolia +	Tea plant	Perennial, erect wiry shrub	Condensation zones, host plant for endemic insects
Mellissa begoniifolia +	Boxwood	Perennial shrub	Condensation zones
Hypertelis acida +	Salad plant	Succulent annual or short-lived perennial	Seaward facing slopes, exposed to sea mist/condensation
Chenopodium helenense +	St Helena goosefoot	Erect annual herb, woody at base	Arid areas
Euphorbia heleniana +	French grass	Tiny prostrate annual herb	Arid Areas. Rare on site
Plantago robusta +	Plantain	Tufted rosetted perennial	Condensation zones. Cliffs and rocky places – where cool sheltered (from sun exposure) environment is created.
Portulaca oleracea	Purslane	Prostrate annual herb	Arid areas
Cotula coronopifolia	Pagoda plant	Rosetted annual herb	Arid areas
Osteospermum sanctae-helenae+	Boneseed	Prostrate annual herb	Arid areas
Pelargonium cotyledonis +	Old Father live-forever	Thick stemmed perennial, prostrate to sub-erect	Seaward facing slopes, exposed to sea mist/condensation Cliffs and rocky places – where cool sheltered (from sun exposure) environment is created.
Cook's Bridge – Government Garage			
Trochetiopsis ebenus +	Ebony	Perennial shrub	Enhancement planting
Commidendrum rugosum +	Scrubwood		Condensation zones
Suaeda fruticosa	Samphire	Low spreading shrub	Arid areas, host plant for endemic insects
Government Garage – Mulberry Gut			

Species	Common name	Plant form	Habitat Notes
Trochetiopsis ebenus +	Ebony	Shrub	Enhancement planting / ebony gumwood thicket
Commidendrum robustum +	Gumwood	Tree	Dry gumwood woodland
Mulberry Gut – Deadwood			
Trochetiopsis ebenus +	Ebony		Enhancement planting/ebony gumwood thicket 200-500m
Commidendrum robustum +	Gumwood	Tree	Dry gumwood woodland
Commidendrum rotundifolium +	Bastard Gumwood	Tree	Dry gumwood woodland (400 – 520). Rare seed may be limiting.
Deadwood – Rupert's Valley			
Commidendrum robustum +	Gumwood	Tree	Dry gumwood woodland (limited to upper areas adjacent to Deadwood)
Commidendrum rugosum +	Scrubwood	Shrub	From trig point, beside Pipe Path to the coast
Trochetiopsis ebenus +	Ebony	Shrub	Arid areas 200-500m
Commidendrum rotundifolium+	Bastard Gumwood	Tree	Dry gumwood woodland (400-520)
Osteospermum sanctae-helenae+	Boneseed	Prostrate annual herb	Arid areas
Suaeda fruticosa	Samphire	Perennial shrub	Arid areas
Pelargonium cotyledonis +	Old Father live-forever	Thick stemmed perennial, prostrate to sub-erect	Condensation zones
Rupert's Valley			
Commidendrum rugosum +	Scrubwood	Low growing perennial shrub	Condensation zones
Suaeda fruticosa	Samphire	Perennial shrub	Arid areas, host plant for endemic insects

4.2.3.5 The planting programme shall take account of the varying sensitivity of sites to introduction of soils and a plan will be produced detailing where soil introduction is permissible for plant establishment.

4.2.3.6 In certain areas, by agreement with the Engineer, non native species may be considered for use, e.g. on Deadwood Plain in areas where trees planted for windbreaking and soil erosion control will be impacted. Whilst the native Gumwood will provide windbreaking and soil erosion control, other non native species might be better to enable agricultural syndicate members to control crop trees to provide fodder for cattle in dry seasons.

4.2.3.7 No added fertilisers, soil nutrients or improvers shall be allowed in areas of replanting in PBP without approval of the Engineer. However, in some other locations, due to the degraded nature of some of the existing soils on the island, suitable growing medium may need to be manufactured to achieve satisfactory plant establishment. This will be undertaken by others managed by the Employer's Environmental Consultant (refer to 4.3.2.2).

4.2.3.8 The Contractor's planting programme shall take account of the varying sensitivity of sites to introduction of soils by referring to the plan identifying where soil introduction is permissible for plant establishment (this will be produced by others, refer to 4.3.3.3).

4.2.4 Requirements in Respect of the Airfield (including runway and RESA, clear and graded areas of runway shoulder, apron and terminal building, fuel stores, Dry Gut embankment and extent of all earthworks)

4.2.4.1 In the identified areas where desert soils are to be retained for future use, the original overlying material shall be stripped, stored and reapplied to the worked and re-graded surfaces where

appropriate and subject to agreement with the Engineer. Figure 1 in this EMP identifies these areas where the surface material shall be stripped and stored for the re-creation of specific sand and dusty habitats.

4.2.4.2 Special requirements shall be made to obtain and store, so as to be protected from loss to wind or water erosion, the various grades of substrate from fine grits, sands and dusty sands for subsequent re-application in the areas identified by detailed design for habitat creation by topsoil reinstatement (these areas are likely to include the new embankments formed from the runway extension and RESA in Dry Gut and other areas of disposal of surplus fill for landscape profiling).

4.2.4.3 As described in the Employer's Requirements, Volume 3b Section 1 Earthworks, detailed design shall seek to establish new areas of flat desert habitat with fine sand and dust substrate such as is currently present in the Central Basin where shelter from the prevailing wind can be obtained. Options shall be explored to provide broad terraces along the western face of the new embankment supporting the runway and RESA across Dry Gut. Here, retained fine desert deposits shall be reapplied to the level and sheltered surfaces. The key objectives required to achieve the ecological function are as follows:

- Design of the terraces shall seek to provide various widths of terrace of which some shall be 10m, or more in width, on the sheltered western edge.
- The terraces shall be constructed to receive and retain fine sandy and dusty sediments. A fine grade geotextile (Terram T4500) shall be used with an overlying sub grade layer of coarser sediment to 300mm depth.
- Finer sediments shall overlay this to a depth of at least 300mm, reflecting the average burrow depth of some desert spiders at around 200-250mm.

4.2.4.4 In addition to the above, additional mitigation requirements may be identified which the Contractor shall carry out. This may include the pre-construction removal, storage and subsequent placement of weathered rock including lichen covered material translocated from disturbed areas of PBP, identified by, and in agreement with the Engineer.

4.2.4.5 The design of the airport perimeter security fence shall take account of the desirability to provide an element of local wind shielding to the fine sandy and dusty habitats of the adjacent areas of the Central Basin. In accordance with the Employer's Requirements Volume 3b Section 7 Security Fencing the fence adjacent to the Central Basin shall be fitted with fine graded plastic mesh. The fence design and the details of the mesh shall aim to attenuate windspeeds.

4.2.4.6 The airport security fencing should be of such a mesh size (e.g 50x50 mm square mesh) so as to be permeable to wirebird chicks. The wind attenuation mesh attached to the western perimeter fence should therefore be applied at a height of around 150mm above ground level so as to allow wirebird chicks to pass through the security mesh beneath.

4.2.4.7 During construction and operation of the airfield, excess runoff into the central basin shall be avoided in order to protect the sensitive habitat and invertebrate communities.

4.2.4.8 Pre-construction removal, storage and subsequent placement of weathered rock including lichen covered material translocated from disturbed areas of PBP shall be undertaken.

4.2.5 Requirements in Respect of Haul / Permanent Access Route, and existing roads elsewhere on St Helena if required

4.2.5.1 A key requirement is the avoidance of any sensitive features (ecological and landscape) through detailed route alignment and design.

4.2.5.2 As described in Volume 3b Section 9, Access Roads and Car Park the haul/permanent access route shall not be routed along prominent ridgelines or across visible landforms and shall be sympathetically designed to integrate it into the landscape.

4.2.5.3 The haul/permanent access route shall be designed to minimise impacts to the Wirebird territories. Prior to construction the existing Wirebird territories identified on Figure 1 in this EMP and Figure 9.6 in Volume 3 of the ES, shall be reviewed and surveyed by an approved specialist to confirm their location and extent.

4.2.5.4 The small colony of scrubwood and lichen on Rupert's Hill shall be avoided in the detailed route design and shall be protected during construction.

4.2.5.5 Haul roads which run adjacent to environmentally sensitive areas shall be clearly fenced and signed such that all traffic will be marshalled to keep to the prescribed route. Refer to Figure 1 in this EMP.

4.2.5.6 Re-establishment of habitats and endemic and indigenous vegetation shall be carried out along the entire length of the permanent access route in order to help assimilate the road into the local and wider landscape as well as to compensate for habitat loss. Plant communities shall reflect those identified in Table 4.1, section 4.2.3.4 and reflect the changing altitude, exposure and landscapes along the route corridor.

4.2.5.7 Reinstatement and compensatory planting shall reflect the more local landscape structure particularly in the Deadwood, Longwood, Bottom Woods sections of the haul/permanent access route.

4.2.6 Requirements in Respect of the Wharf and Rupert's Bay

4.2.6.1 Mitigation shall be provided for the loss of littoral and benthic habitats, particularly rocky substrates that support epiphytic plants and animals (i.e. those attached to the surface) or which provide voids and crevices as refuges for fish and invertebrates. This shall to some extent be achieved through the detailed design and method of construction of the wharf which could provide attachment substrates and cavities for marine wildlife.

4.2.6.2 As described in Volume 3b Section 16 Wharfage and Port Facilities. The wharf shall as far as reasonably practicable be designed to sympathetically reflect the coastal landscape. The design shall minimise adverse effects on water quality and the marine and coastal ecology.

4.2.6.3 The design of the wharf shall aim is to avoid impeding the natural flow of water and sediment around the bay.

4.2.6.4 Rock armour shall be used in preference to concrete armour units particularly in inshore sections of the wharf.

4.2.6.5 Storage of materials and compound areas shall avoid ridgelines, sensitive and historic landscape features and removal of additional landform.

4.2.6.6 Materials acquisition and quarrying needs associated with construction of the wharf shall be identified in consultation with the Engineer.

4.2.6.7 The finished quarried slopes shall be graded to reflect natural profiles. The design of the quarry slopes shall be to the approval of the Engineer.
If re-instatement of the Bank's Battery footpath is required as a result of construction activity, a sensitive route which sympathetically fits into the coastal landscape shall be designed.

4.2.6.8 The location of the quarry should avoid the areas of importance for lichens in Rupert's Valley as shown on Figure 1, Environmental Constraints in this EMP. However, should quarrying affect these areas pre-quarrying removal, storage and subsequent placement of weathered rock sustaining important lichen habitat. Lichen covered material shall then be translocated from the quarry site to appropriate locations to be agreed with the Engineer.

4.2.7 *Requirements in respect of Ancillary Components (these include in-shore sea rescue lifeboat to be moored off Jamestown, the bulk fuel farm, aeronautical ground lighting, approach lighting, remote obstacle lighting, navigational system installations, power supply, water supply, waste disposal, construction compounds, materials storage and handling facilities, temporary accommodation areas)*

4.2.7.1 As insufficient design information is currently available, mitigation to minimise the impacts associated with all of the above components shall be developed in conjunction with the Contractor's design team and the Engineer.

4.2.7.2 The external finishes of buildings, structures and tanks shall be agreed with the Engineer, as shall the choice of building materials and colour palette in order to minimise their visibility in the wider landscape.

4.2.7.3 Design and micro-siting of the bulk fuel farm shall be undertaken in consultation with the Employer's Environmental Consultant, as shall the choice of building materials, colour palette, landform design and finished slope profiles.

4.2.7.4 Watercourse diversions shall follow natural and sinuous forms. The channel profiles of any diverted watercourse shall reflect a natural channel form with varied bank slopes and bed width.

4.2.7.5 Subject to the future use of the decommissioned bulk fuel farm, all areas of disturbed ground with no future commercial use shall be fully reinstated, including remedial works involving but not limited to, ground de-contamination, de-compaction and thorough preparation prior to the establishment of vegetation by others.

4.2.7.6 Offsite works required for the installation of, and access routes to, any of the above noted ancillary airport components, shall minimise land take whilst achieving the construction and maintenance objectives. Further detailed survey will be undertaken by others in parallel with the design to ensure that damage to any valued ecological resources such as endemic plants is avoided or minimised by appropriate mitigation. The design shall also take into account the local landscape sensitivities and provide a design which minimises the intrusion into both the local and wider landscape.

4.2.7.7 As described in the Employer's Requirements, Volume 3b, Section 9 access routes to any of the above components shall as far as reasonably practicable be designed to fit sympathetically into the landscape and shall not be routed along prominent ridgelines or across open visible landforms, wherever possible.

4.2.7.8 Routes adopted for construction access shall be strictly adhered to in the future as a permanent waymarked access for maintenance to prevent damage to any neighbouring sensitive habitats.

4.2.7.9 Trenches and other excavations shall be fully reinstated using stripped soil material and appropriate endemic and indigenous plant species.

4.2.7.10 Pre-construction removal, storage and subsequent placement of weathered rock including lichen covered material translocated from disturbed areas, shall be undertaken as part of landscape restoration.

4.2.7.11 Locations for the storage of materials and compound areas shall avoid being sited on prominent ridgelines, open, visible landscapes or valued ecological resources such as endemic plants.

4.2.7.12 Should a permanent access road be required to Prosperous Bay, then extreme care shall be taken in designing an alignment which is most sensitive to the landscape features that make this such a scenically outstanding environment and in avoiding areas which might potentially be a habitat for *Nesopupa turtoni* . The design and development of any facility in the Prosperous Bay beach area shall be undertaken in close liaison with the Engineer.

4.2.7.13 All new power supplies shall be routed below ground in sensitive and visually intrusive locations.

4.2.7.14 The inlet and outlet structures shall be designed to be as un-obtrusive as possible within the watercourse and where practicable the structure shall be clad with local stone. As a minimum the concrete facings to structures, including culverts, stepped chutes, walls, wing walls and

channels shall be colour matched as far as possible to reflect the local aggregate colour to help integrate theses structures into the landscape.

4.2.8 *Requirements in Respect to Long-Term Monitoring and Maintenance*

4.2.8.1 For the length of Phase 2 of the Contract, the Contractor shall provide a maintenance period for the maintenance and management of the landscape and ecological habitat and reinstatement works within the operational site boundary. All maintenance work during this period in the PBP area shall be undertaken from the access road only or alternatively on foot.

4.2.8.2 Control of invasive plants in PBP within the operational site boundary including the area of re-established plant communities is essential to the long term success of habitat reinstatement and shall form part of the maintenance programme. Monitoring shall therefore take place of all disturbed areas and action taken to remove non-native vegetation (weeds) when and wherever they occur, to prevent a build up of a soil seed bank and subsequent spread.

4.2.8.3 A long-term management plan for landscape and ecological maintenance will be developed by the Employer's Environmental Consultant (the Engineer) in parallel with completion of the EIA and refinement of the design which the Contractor shall adhere to. A preliminary approach has therefore been developed and includes a requirement for the following landscape and ecological monitoring and maintenance to be undertaken by a suitably qualified specialist in conjunction with the relevant Departments of SHG.

- Following planting, plant establishment shall be monitored on a quarterly basis and reported to SHG for all areas of habitat reinstatement within the airport site. Replacement planting may be required on an annual basis where plant densities fall below agreed densities (to be determined by Employer's Environmental Consultant (the Engineer)). Non-native vegetation (weeds) and invasive plants shall also be removed.
- All plant material shall be irrigated for a minimum of 2 years post planting and closely monitored for this period. Irrigation of plant material shall be strictly controlled and directed to each plant. Careful control shall be given to irrigation in the vicinity of the central basin.

4.2.8.4 Where there is concern that mitigation is not proceeding satisfactorily, additional checks may be needed and remedial action taken accordingly.

4.3 PROJECT RELATED WORKS

(works which will be implemented as part of the mitigation requirements of the Access Project but are **not** required to be undertaken by the Contractor)

4.3.1 *Additional Studies*

Work has been carried out under the responsibility of the Employer's Environmental Consultant. This work will be undertaken in order to inform the EIA and specifically the terrestrial ecology assessment and thereby the mitigation requirements and subsequent environmental management. The following study will be made available to the Contractor to inform the refinement of the design

- Invertebrate communities on PBP but also elsewhere on the island include many rare and endemic species. Areas of Dry Gut and the access road corridors will be subject to a habitat assessment for their invertebrate communities to inform the mitigation plan and detailed alignment design.
- Wind modelling and substrate particle analysis will try and establish how the potentially significant change to the upwind landforms associated with excavation, levelling and runway construction will affect the future conditions in the central basin of PBP and will explore options for wind attenuation
- The marine survey includes an ecological survey of the sea-bed communities in the area of the proposed site for the wharf in order to provide baseline information against which mitigatory measures can be identified during detailed design.

4.3.2 Advance Mitigation Works

4.3.2.1 Advance offsite (outside the Site) mitigation works will be identified by the Employer's Environmental Consultant and undertaken by others. Advance works will comprise the following (no order of priority is implied by the paragraph order).

4.3.2.2 A programme of seed collection, germination and propagation will be undertaken by others managed by the Employer's Environmental Consultant to ensure a stock of endemic and indigenous plant material is available for habitat and landscape restoration. The project will include an investigation of growing medium and soils required to achieve satisfactory plant establishment, to match plant requirements and to conform to natural soil types in the area of planting. Any requirements to manufacture soil on the island using existing substrate material and processing this with composted organic waste derived from decomposed organic material growing on St Helena, for plantings in areas where soil degradation may be a limiting factor, will be investigated. Propagation soil will be designed to match plant requirements and soils in the area of planting. No import of material will be permitted.

4.3.2.3 Trial propagation and plant establishment trials will be undertaken by others managed by the Employer's Environmental Consultant prior to construction in order to determine optimal techniques for the re-establishment of all selected plant species.

4.3.2.4 Commencement of a weed eradication programme (including creeper, prickly pear) in PBP (outside the Site) in order to reclaim desert habitat in mitigation for direct land take for the airport and to enhance the reclaimed habitat for indigenous and endemic plants and the endemic Wirebird. Resources will be required to restore an area of 125 – 150ha of desert and semi-desert habitat in the PBP area to a condition resembling the former conditions prior to weed invasion, using natural regeneration to develop a predominance of vegetation dominated by endemic and indigenous species (as identified in Table 4.1, section 4.2.3.4).

4.3.2.5 One clear factor in the decline of the endemic Wirebird on St Helena is the degradation of the pastures with colonisation by coarse bull-grass and a variety of scrub species. Advance mitigation works will be undertaken to sustain and enhance Wirebird populations in mitigation for land take and disturbance in PBP and along the haul roads. This will comprise the following:

- Reinstatement and enhancement of pastures to improve the carrying capacity for the Wirebird at Deadwood, Longwood, and Bottom Woods and other agreed locations will be undertaken prior to construction works commencing.
- Weed species will be eradicated from the grasslands including Bottom Woods, Middle Point, Flagstaff and parts of Deadwood to increase the available habitat for Wirebird recolonisation due to loss of habitat and disturbance as a result of the haul/permanent access route. These pastures will be restored, by ploughing and re-seeding where necessary, and managed by rotational grazing.
- Wild mango will be removed at Cook's bridge by cutting it back and then applying an approved herbicide, suitable for application by water and reviewed by the Engineer.
- Long term maintenance of some open flowing watercourse at Cook's Bridge will also be required.

4.3.2.6 Advance planting will be undertaken along sections of the haul/permanent access road which are particularly prominent in the landscape. These areas will be identified by the Employer's Environmental Consultant and will enable the road to be more successfully integrated into the landscape.

4.3.2.7 Advance planting will be undertaken in sensitive locations for example where the haul/access road is prominent in the view from residential properties in order to provide a screening function. Advance planting will allow for plant establishment prior to construction works commencing and consequently a greater level of plant growth by the end of the construction period. Locations will be agreed on completion of the visual assessment (EIA).

4.3.3 *Additional Information*

4.3.3.1 Areas of wider compensatory landscape and ecological mitigation outside the Contractor's direct works will be undertaken by others. This includes a 2 year defect period during which landscape and ecological compensatory habitat works will be protected, maintained and the defects made good.

4.3.3.2 Table 4.1 in section 4.2.3.4 identifies the proposed indigenous plant species ("+" endemic) for planting/seeding of all areas of reinstatement and compensatory habitat associated with the Access Project. When establishing plant mixes, consideration will be given to habitat requirements in relation to substrate types, soil chemistry such as salinity or phosphate concentrations and exposure conditions.

4.3.3.3 The planting programme will take account of the varying sensitivity of sites to introduction of soils and a plan will be produced detailing where soil introduction is permissible for plant establishment.

4.3.3.4 In certain areas, non native species may be considered for use e.g. on Deadwood Plain in areas where trees planted for windbreaking and soil erosion control will be impacted. Whilst the native Gumwood will provide windbreaking and soil erosion control, other non native species might be better to enable agricultural syndicate members to control crop trees to provide fodder for cattle in dry seasons.

4.3.3.5 The long term maintenance and management of plants outside the operational site boundary will be required for a period of 10 years after planting during which landscape and ecological habitat and reinstatement works will be protected and maintained. A landscape and ecological maintenance and long term management plan will be developed by the Employer's Environmental Consultant in parallel with completion of the EIA and refinement of the design and will include, but not limited to the following.

- Control of invasive species will be required with the removal of non-native vegetation (weeds) and invasive plants to prevent a build up of a soil seed bank and subsequent spread.
- Quarterly monitoring of plant establishment with replacement planting required on an annual basis where plant densities fall below agreed densities (to be determined by Employer's Environmental Consultant).
- All plant material will be irrigated for a minimum of 2 years post planting and closely monitored throughout this period. Irrigation of plant material will be strictly controlled and directed to each plant. Careful control will be given to irrigation in the vicinity of the Central Basin.

4.4 LONG TERM LANDSCAPE AND ECOLOGICAL MANAGEMENT PROJECTS FOR THE ISLAND

(works which are **not** required to be undertaken by the Contractor but are an important part of the long term management of compensation measures for the Access Project.)

4.4.1 The following activities are not required to be undertaken by the Contractor but are an important part of the long term management and monitoring of compensation measures proposed for the Access Project.

4.4.2 In order to protect existing endemic and indigenous flora as well as all proposed reinstatement planting, an island wide programme of pest control (mice, rabbits and other feral animals) is required. This should be initiated in advance of all reinstatement planting works associated with the access project and will be monitored on an on going basis.

4.4.3 Pastures for Wirebird habitat (Deadwood, Longwood and Bottom Woods) may need to be managed initially on an annual basis by mowing until such time as improvements in the agricultural economy can be achieved with the intention that all pastures are ultimately managed for cattle grazing and Wirebird conservation. This is currently being addressed through project activity by SHG, St Helena National Trust and the RSPB under a project being funded by the DFID/FCO Overseas Territories Environment Programme.

4.4.4 The Wirebird population of the airport site and areas adjacent to the permanent road should ideally be monitored annually for a minimum of 10 years. This could form part of the existing Wirebird monitoring remit undertaken by ANRD. The monitoring should include recording incidences of collision of Wirebirds with the fencing.

4.4.5 A visual assessment followed by small scale particle size analysis should ideally be undertaken of substrate characteristics in areas of habitat re-instatement in the first year following re-instatement and then every second year for a 10 year period.

4.4.6 Invertebrates in reinstatement areas should ideally be monitored every 3 years (using fixed sample points) for a 10 year period. The survey should include the non-native as well as widespread invertebrate species which will give an idea of the changes taking place.

Appendix A St Helena's Environmental Ordinances

Endangered, Endemic and Indigenous Species Protection Ordnance	1996/7 & 1996/8
Fishery Limits Ordinance	1977/5
Fish and Fish Products Regulation Ordinance	1998/4
Harbours Ordinance	1998
Merchant Shipping Acts (Application) Ordinance	1195/6
Spear Gun (Control) Ordinance	1996/17
St Helena Fisheries Corporation Ordinance	1979/4
Whale Fisheries Ordinance	Cap 127
Merchant Shipping (Oil Pollution) Order	1981/11
Oil Pollution (Compulsory) Insurance Regs	1976/7
National Parks Ordinance	2003
Conservation and Management of Fishery Resources Ordinance	2003
Endangered Species Protection Ordinance	2003
St Helena National Trust Ordinance	2001
High Seas Fishing Ordinance	2001
Land Planning and Development Control Ordinance	1998
Birds Protection Ordinance	1996
Bees Ordinance	2001
Termites Ordinance	2001
Plants Ordinance	2001
Airport Development Ordinance	2006

Appendix B Euro Standards for Vehicle Emissions

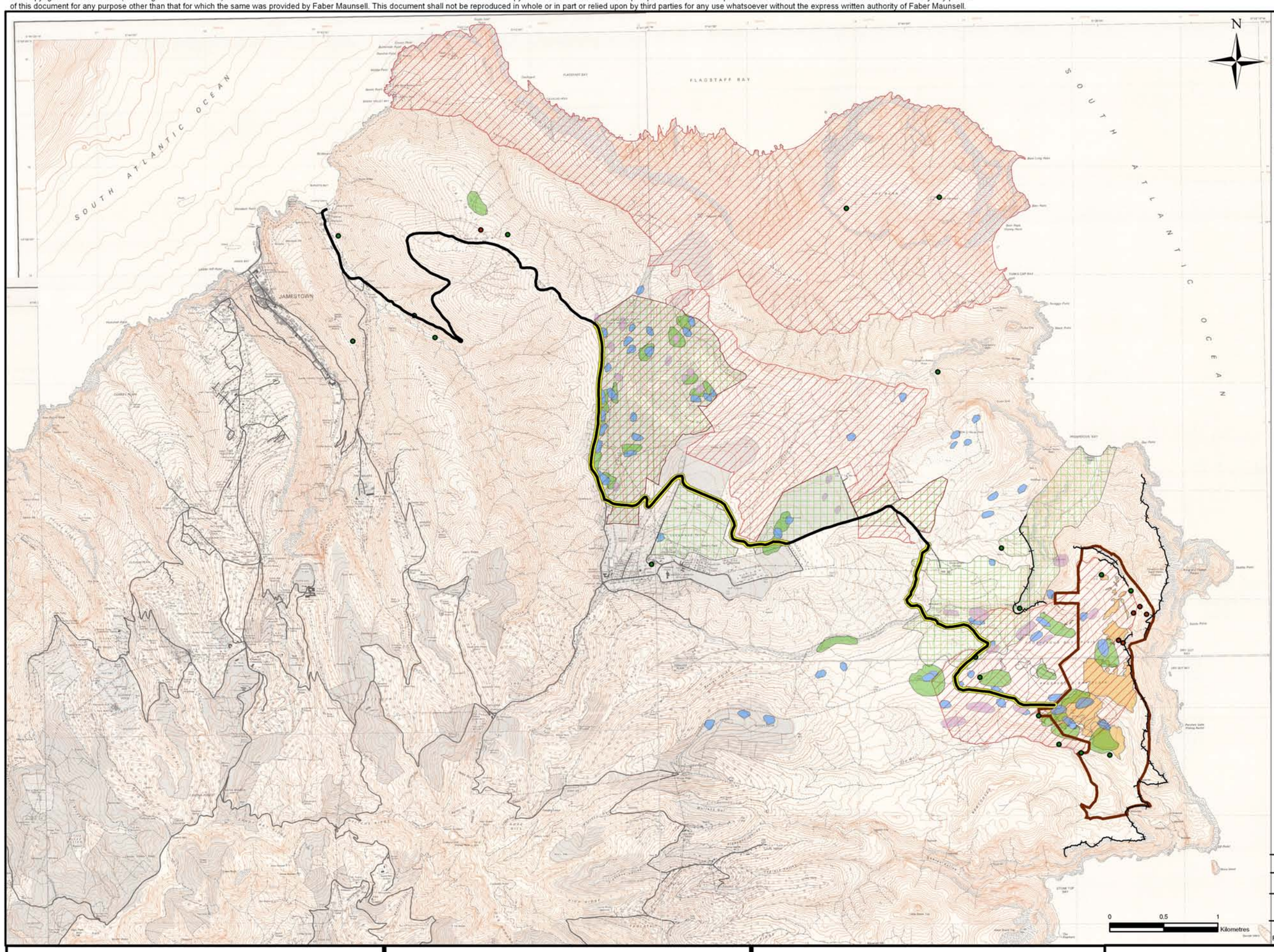
The table below outlines the Euro Standards that have been introduced or those that have been agreed to.

Standard	Directive	Type of Vehicle	Date of introduction (for type approval)
Euro I	91/444/EEC 93/59/EEC 91/542/EEC	passenger cars light commercial vehicles heavy diesels	31 December 1992 1 October 1994 1 October 1993
Euro II	94/12/EC 96/69/EC 91/542/EEC	passenger cars light commercial vehicles heavy diesels	1 January 1997 1 October 1997 1 October 1996
Euro III	98/69/EC Common Position	passenger cars & light commercial vehicles heavy diesels	1 January 2001 1 January 2001
Euro IV	98/69/EC Common Position	passenger cars & light commercial vehicles heavy diesels	1 January 2006 1 January 2006*
* Further NOx emission standards would also be introduced from 1 January 2009 as part of the same directive			

The table below outlines the relative emission performance of different vehicle type by fuel and emission standard on an urban test cycle.

Type of Vehicle	Emission Standard	Carbon Monoxide	Hydrocarbons	Oxides of Nitrogen	Particulates
Petrol Car	pre-Euro I	100	100	100	5
	Euro I	15	9	19	2
	Euro II	10	4	9	2
	Euro III	7	3	6	2
	Euro IV	4	2	3	2
Diesel Car	pre-Euro I	7	10	43	100
	Euro I	4	4	29	55
	Euro II	3	3	21	31
	Euro III	2	2	13	20
	Euro IV	2	1	7	10
Petrol LGV	pre-Euro I	151	120	114	10
	Euro I	30	6	21	5
	Euro II	21	3	9	5
	Euro III	17	2	6	5
	Euro IV	7	1	3	5
Diesel LGV	pre-Euro I	10	20	82	209
	Euro I	8	15	40	115
	Euro II	6	9	30	63
	Euro III	4	4	26	41
	Euro IV	3	3	13	20
Rigid HGV	pre-Euro I	38	192	640	484
	Euro I	21	113	440	318
	Euro II	17	105	316	168
	Euro III	9	47	224	113
	Euro IV	6	33	158	22
Articulated	pre-Euro I	44	183	1704	700

HGV	Euro I	22	87	893	482
	Euro II	18	78	650	185
	Euro III	9	47	461	124
	Euro IV	7	33	325	24
Bus	pre-Euro I	63	83	795	458
	Euro I	28	90	859	304
	Euro II	22	84	614	187
	Euro III	11	50	436	125
	Euro IV	8	35	307	24
Motorcycle	less than 50cc: 2 stroke				
	greater than 50cc: 2 stroke	34	135	2	-
	greater than 50cc: 4 stroke	74	338	4	-
		67	68	13	-



Key

- Haul/ permanent access route
- Sections of haul route to be fenced adjacent to sensitve areas
- Airport construction phase boundary
- Areas of Environmental Constraints (including the central basin) (Outside the permanent footprint of the earthworks, no works will be permitted in these areas of environmental constraint without the prior agreement of the Engineer. Refer to EMP for further details)
- Draft National Protected Areas (Refer to St Helena Land Development Control Plan)
- Surface material to be stripped and stored.
- Wirebird Territories (Approximate Extent)
- November 2006-February 2007 (Information from RSPB letter of 28-02-07)
- November-December 2006 Survey (Approximate centre of wirebird territory, mapped with assistance from Gavin Ellick. Only territories adjacent to haul route were mapped)
- April - May 2006 Survey
- November - December 2005 Survey
- Endemic flora to be protected
- Areas of Importance for Lichens
- Ridgelines/Cliff Edges to be protected where they are not within the permanent footprint of the earthworks.

Refer to Figure 1 for heritage, land use & other constraints.

Road alignment shall avoid area of endemic Scrubwood at Rupert's Hill.

This drawing to be read in conjunction with the Environmental Management Plan (EMP)

For information only. Refer to Employer's Requirements for Details of Scheme Design.

Rev	Date	Revision	GIS	Chk'd	App'd
D	27/04/07	ADDITIONAL WIREBIRD TERRITORIES & AREAS OF LICHENS ADDED	CS	RK	IAB
C	11/07/06	NOTE ADDED REGARDING AVOIDANCE OF SCRUBWOOD	CS	RK	IAB
B	05/07/06	ADDITIONAL ENVIRONMENTAL CONSTRAINTS ADDED (MILLENNIUM FOREST EXTENDED)	CS	RK	IAB
A	21/06/06	SECTION OF HAUL ROUTE TO BE FENCED AND AIRPORT CONSTRUCTION PHASE BOUNDARY ADDED	CS	RK	IAB

Client: DFID/SHG

Project: ST. HELENA AIRPORT AND SUPPORTING INFRASTRUCTURE

Title: FIGURE 1 (EMP) ENVIRONMENTAL CONSTRAINTS (ECOLOGICAL ONLY)

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GIS: CS	Chk'd: RK
App'd: IAB	Status: DRAFT
Date: 01/06/06	Scale: 1:35,000
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