ANNUAL ENVIRONMENTAL REPORT FOR PHASE 1: CONSTRUCTION 2016 - 2017

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REV	DATE	SECTION (S) OF CHANGE	DESCRIPTION OF REVISION
A	2017-07-13	New	First draft for internal review
B	2017-10-19	All	Final draft for submission to PMU and AO
C	2017-11-28	All	Corrections based on PMU/SHG comments
D	2017-12-14	KPI table Table 1 S. 1 para 3	Minor corrections based on PMU comments

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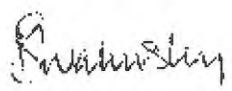			
Bryony Walmsley	**Graham Temlett**	**Deon de Jager**	**Miles Leask**

ST HELENA AIRPORT PROJECT

ANNUAL ENVIRONMENTAL REPORT FOR PHASE 1: CONSTRUCTION 2016-17

December, 2017

Prepared by
Bryony Walmsley
CEMPC

ST HELENA AIRPORT PROJECT

ANNUAL ENVIRONMENTAL REPORT FOR PHASE 1: CONSTRUCTION 2016-17

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FOREWORD

It is now almost six years since Basil Read signed the Contract to build St Helena Airport and the associated works including Rupert's Wharf, the 14 km Haul/Access Road, the Sea Rescue Facility, the Airport Fuel Facility and the Bulk Fuel Installation.

It is not often that one has the privilege of continuity of environmental management services from start to finish on a project of this nature. Therefore, my commendation and thanks go to our CEMPC, Bryony Walmsley, our CECO, Annina Hayes, and her team of assistants for their passion and commitment in managing all environmental issues relating to this magnificent airport project over the past six years. The environmental team has carried out their roles and responsibilities professionally, competently and enthusiastically.

May I also thank our Basil Read Construction Managers and teams for their support of the Contractor's Environmental Management Plan to protect and enhance environmental conditions on the Island.

While there are still a couple of repeat findings and observations during the 6-monthly environmental audits, it is encouraging to note the improvements tabled during each Annual Environmental Report. I would like to encourage all those who are still involved in the St Helena Airport Project to continue to aim at improving the high standards maintained during the Construction phase of the project, and carry it over the final hurdle with pride.

May teamwork with SHG and PMU environmental teams continue to prevail as we enter the final chapter of the construction phase.

I wish you all the best.
Graham Temlett
Basil Read Project Director

ACKNOWLEDGEMENTS

As the project slowly winds down, it is inevitable that people leave and move on. Those who have been influential in the environmental management of the project include Jimmy Johnston, the Basil Read Project Director, who retired in February 2017. Jimmy was involved with the project from the tendering stage in 2007 and he provided invaluable support to the environmental team throughout.

Thanks also go to the Basil Read staff, who were part of the environmental team at the height of construction, but left the team during the past year: Margie Fowler, Technical Assistant: Conservation; Sasha Benjamin, Monitoring and Field Assistant; Walter Williams, Waste Operator; and Travoy Stevens, Field Assistant and Waste Operator. Another key member of the team to depart during the year was Jeremy Johns, the Community Liaison Officer (CLO), who also ably stood in for the Contractor's Environmental Control Officer (CECO), Annina Hayes, when she was on leave. Much appreciation goes to Anel Haywood, the BR Paramedic, who provided stand-in and moral support for Annina over the past five years.

The environmental team would not have been able to function effectively without the support of many other BR staff members who left the Island this year as the main construction part of the work wound down. Huge appreciation goes to Ravi Michael, the Logistics Manager, who managed all our requests for equipment and materials and also dealt with many waste handling issues. We also appreciate the environmental concern and efforts to comply with the Contractor's Environmental Management Plan (CEMP) made by Derrick Alexander, Buildings Manager, Deon Robbertse, Earthworks Manager, and Vanessa Alexander, Camp Manager.

Robert Kleinjan, the Environmental Monitor for the Project Management Unit, ensured that the construction team adhered to the Contractor's Environmental Management Plan. He is thanked for his input to designs, chairing all our meetings, as well as his supervisory role and attention to detail. Robert left the Island in August 2016, but still has an oversight role, albeit remotely. Lauren Evans joined the Access Office in January 2014 as their environmental lead and provided input to the Environmental Management System which has been developed by Basil Read for the airport operational stage. Lauren left the project in November 2016 to move overseas. Finally, the project manager of the Landscape and Ecological Mitigation Programme (LEMP), Ross Towers, left the Island in October 2016. Ross was instrumental in getting the LEMP up and running.

Many thanks to Kirstie Pritchard, the replacement LEMP project manager, for her cooperation and constructive approach to working with our team and for providing a report on LEMP activities for the year for inclusion in this report. Thanks also to Annalea Beard and the ENRD marine team for their annual Rupert's bay dive survey report.

Lastly, as always, many thanks to Annina, the CECO, who not only managed to look after all environmental aspects of Phase 1 construction, but she helped the environmental team at the airport get up and running, and also found time to get married during this past year!

Photographs: all by Basil Read, except where indicated.

LIST OF ACRONYMS

ADA	airport development area
ADAB	airport development area boundary
AER	annual environmental report
AFF	airport fuel facility
AIDS	auto-immune deficiency syndrome
ANRD	Agricultural and Natural Resources Division
BFI	bulk fuel installation
BR	Basil Read
CECO	Contractor's Environmental Control Officer
CEMP	Contractor's Environmental Management Plan
CEMPC	Contractor's Environmental Management Plan Coordinator
CLO	Community Liaison Officer
dB(A)	decibel (A-weighted)
DfID	Department for International Development
DVOR	doppler VHF omni-directional radar
eC	electrical conductivity
EC	European Commission
EIA	environmental impact assessment
EMD	Environmental Management Division (of SHG)
EMP	environmental management plan
EMS	environmental management system
ENRD	Environment and Natural Resources Directorate
ES	environmental statement
EU	European Union
HIV	human immune-deficiency virus
HPLS	Horse Point Landfill Site
kg	kilogram
km²	square kilometre
KPI	key performance indicator
kWh	kilowatt hour
LEMP	Landscape and Ecological Mitigation Plan
m	metre
m²	square metre
m³	cubic metre
mg	milligram
ml	millilitre
mm	millimetre
MSDS	material safety data sheet
NFM	near field monitor
PBP	Prosperous Bay Plain
PM10	particulate matter (smaller than 10 micron)
PMU	Project Management Unit
ppm	parts per million
ppt	parts per thousand
PPV	peak particle velocity
ROL	remote obstacle light

SEF	stakeholder engagement forum
SHEQ	Safety, Health, Environment, Quality
SHG	St Helena Government
SHNT	St Helena National Trust
TDS	total dissolved solids
TSP	total suspended particulates
µg	microgram
UK	United Kingdom
VHF	very high frequency
WHO	World Health Organisation
WMP	(Contractor's) waste management plan

EXECUTIVE SUMMARY AND KEY PERFORMANCE INDICATORS

The year has been characterised by the winding down of construction activities and the associated rehabilitation of disturbed areas. A large part of this included a massive effort by all concerned to remove tonnes of construction waste to its various designated destinations. Several sites have now been handed over from Basil Read (BR) to the St Helena Government (SHG) and these are no longer monitored by the environmental team. By the end of the year, construction work was focussed on the bulk fuel supply system in three key areas: the Airport Fuel Facility (AFF), the Bulk Fuel Installation (BFI) in upper Rupert's Valley, and the Bayside facility and pipe gantry at the old Solomons site in lower Rupert's Valley.

One of the deliverables during the airport construction period, as specified in Schedule v4.1.19A: Environmental Management Requirements, is an annual environmental report (AER) of the permanent construction works. This document is the fifth AER and covers the Phase 1 construction work in the 12-month period from July 2016 to June 2017. A separate AER has been prepared for airport operations.

During the reporting period, the Contractor, BR, established and maintained their commitment to responsible environmental stewardship, and to minimising and eliminating potential adverse environmental impacts. This was achieved by putting in place the necessary human and financial resources to implement the environmental requirements specified in the Design, Build and Operate Contract.

A set of key performance indicators (KPIs) has been developed for the annual reports and these are grouped under the following headings:

- Legal compliance;
- Environmental structures;
- Environmental systems; and
- Environmental performance (social and biophysical).

For each KPI, an assessment rating has been provided:

- 'Yes' in green means that the target or goal has been achieved.
- 'Partial' in orange means that there has been progress made towards achieving the goal, or that the KPI has been partially achieved.
- 'No' in red indicates where the KPI has not been achieved in the current reporting period.

The table below provides a brief comment, with reference to the section in the report where the matter is discussed more fully.

Of the 30 KPIs, only three have not been achieved during the reporting period, three have been partially met and 24 indicators (80%) have been attained. The number of positive indicators is up from 22 last year, and the number of indicators not met has decreased from seven last year to three. The three non-conformances are:

- One Level 3 incident occurred, caused by a proliferation of pigeons at Bradley's camp. The camp is quite close to the airport and flocks of pigeons in the vicinity of the airfield could pose a safety risk for aircraft and therefore need to be actively discouraged;
- Noise levels remain consistently high in Rupert's valley even though sound levels have decreased with the surfacing of the road through the valley;
- In spite of extensive biocontrol systems in place throughout construction, seeds of the Namibian Ice Plant must have arrived on St Helena in the imported river sand from Namibia. Some of these seeds have germinated and several plants have been identified and removed. Ongoing monitoring is in place.

Overall however, there has been some improvement since last year, with progress on six indicators, and 21 have remained the same. Performance against three indicators has regressed, namely: only three Stakeholder Engagement Forum meetings were held instead of the usual four; the Contractor's Environmental Management Plan Coordinator (CEMPC) and CECO were not consulted about (and therefore had no input to) the position and design of the new fuel line gantry in Rupert's Bay; and the biocontrol issue mentioned above (see table below).

KPI	Description	Assess-ment rating 2015-16	Assess-ment rating 2016-17	Comments
LEGAL COMPLIANCE				
Legal compliance with laws and regulations of St Helena	No non-compliance notices, stop orders or penalties have been issued in terms of environmental laws in force	Yes	Yes	
Compliance with the Contractor's Environmental Management Plan (CEMP)	No environmental incidents with ratings of level 3[1] or more have occurred	No	No	The proliferation of pigeons at Bradley's camp poses a safety risk for the airport. *See section 3.3.*
ENVIRONMENTAL STRUCTURES				
The environmental management team, as specified in the Contract is in place	Appointment and employment of the following positions throughout the reporting period: • CEMP Coordinator (CEMPC);	Yes	Yes	With the winding down of construction, the environmental team has decreased to those necessary to complete the work. The CEMPC, CECO and two field assistants/waste operators were present at the end of the reporting period. The CECO has taken on the role of the CLO.

[1] A level 3 incident is one which could cause moderate, reversible damage to health and/or the environment.

KPI	Description	Assess-ment rating 2015-16	Assess-ment rating 2016-17	Comments
	• Contractor's Environmental Control Officer (CECO); • Technical assistants (TAs); and • Community Liaison Officer (CLO)			*See section 3.1.*
Reporting commitments achieved (as per requirements of Contract)	100% completion of the following: • Weekly verbal CECO reports to PMU; • Quarterly CECO reports; • 6-monthly update of CEMP; • 6-monthly audit; and • AER	Partial	Yes	100% completion of the following: • Weekly verbal reports to PMU; • Quarterly CECO reports; • 6-monthly updates of CEMP; • 6-monthly audits; and • AER. *See section 3.4.*
Meetings held (as per requirements of Contract, as amended by PMU)	The following meetings occur as scheduled: • Bi-weekly Communic-ations Meeting; • Weekly Production Meeting; and • Monthly Meeting	Yes	Yes	Weekly environmental management meetings ceased when the PMU's Environmental Monitor left in August 2016, as agreed with all parties. Environmental issues are reported and discussed at the bi-weekly Communications Meeting and the weekly on/off Island Production Meeting. The monthly environmental management meetings ceased at the end of March 2017 on instruction from PMU, but environmental issues are raised at the monthly project meeting. *See section 3.4.*
ENVIRONMENTAL SYSTEMS				
Ongoing input to design	Environmental issues are taken	Yes	Partial	Environmental input was requested and provided for

KPI	Description	Assess-ment rating 2015-16	Assess-ment rating 2016-17	Comments
	into account during project design			several new design aspects, but not for the Bayside gantry. Site walkovers are conducted prior to construction in each new area. *See section 5.1.*
Environmental monitoring systems are in place (as per the requirements of the Contract and CEMP)	The following are monitored on a regular basis where relevant: air quality (inhalable and total dust), water (marine, surface water and groundwater), noise, vibration, building condition, waste quantities, resources use, Wirebirds, pests, invasive species, visual impact, climate, heritage and biosecurity	Yes	Yes	Aspects listed were monitored as per requirements. *See section 6.*
Comments hot line and complaints procedure established (as per Contract)	Meaning that there is a 24 hour hot line and all complaints are registered and followed up within 1 day where practically possible	Yes	Yes	*See section 4.5.*
ENVIRONMENTAL PERFORMANCE: SOCIAL & COMMUNITY SERVICES				
Stakeholder engagement forum (SEF) established by PMU and functioning	SEF set up and quarterly meetings held	Yes	Partial	Only three SEF meetings were arranged by the PMU in the last year. *See section 4.4.*
Number of complaints received	No serious complaints received;	Yes	Yes	*See section 4.5.*

KPI	Description	Assess-ment rating 2015-16	Assess-ment rating 2016-17	Comments
	Less than 3 minor complaints per month			
Employment of Saints	Direct creation of 112-225 construction jobs for Saints	Yes	Yes	For six consecutive years, more than 100 Saints have been directly employed or taken on as sub-contractors for the project. The numbers are now declining due to the reduction in the amount of construction work. *See section 4.1.*
No additional pressure on island medical facilities	BR to appoint own primary health care practitioner; BR to pay full cost if hospitalisation required	Yes	Yes	The full time medic left in October 2016, but paramedic services are provided by the Airport Paramedic when needed. If required, medical cases are referred to the hospital as agreed with PMU.
No incidents of communicable diseases caused by BR and its sub-contractors	HIV and AIDS awareness and testing programmes are in place for all staff	Yes	Yes	HIV awareness forms part of the Induction programme and ongoing training. Posters are in place and condoms are available at the BR clinic. Staff members are counselled about the need to have HIV tests. No reportable incidents of disease occurred in the year.
Anti-social behaviour and crime	No expatriate BR employee or sub-contractor is convicted of any crime while on the island	No	Yes	No employee or sub-contractor was convicted of any crimes during the reporting period.
Incidents of disturbance to heritage resources	No level 3 incidents or higher reported	No	Yes	
Impact on housing and accommodation	No impact on local housing markets from immigrant workers; Benefit to local guest houses and rental market	Yes	Yes	The majority of the expatriate workforce is housed at Bradley's camp. 19 private residences are leased out to BR for use by staff and short-stay project visitors. *See section 4.1.*

KPI	Description	Assess-ment rating 2015-16	Assess-ment rating 2016-17	Comments
Impact on existing waste landfill facilities	The waste generated from construction works must not put pressure on island waste disposal facilities	Yes	Yes	As much waste as possible is re-used, recycled or minimised, but the scope for recycling on the island is limited due to economies of scale. *See section 6.2.5.*
Safe disposal of hazardous waste	BR must dispose all hazardous waste in the designated hazardous waste disposal sites	Yes	Yes	Hazardous waste is disposed of in the lined hazardous waste cell at Horse Point Landfill Site (HPLS) or burnt in the incinerator. *See section 6.2.5.*
Minimise impact on island water supplies	BR to minimise use of island water supplies and develop new sustainable sources of water for construction	Yes	Yes	Island water supplies are only used for potable water use at all offices, at the Rupert's stores /workshop and for concrete mixing at the Rupert's batch plant. *See section 6.2.6.*
ENVIRONMENTAL PERFORMANCE: BIOPHYSICAL				
Incidents of dust emissions over prescribed limit	No exceedances over permitted limits recorded	No	Partial	TSP results are all within limit. PM10 readings at HPLS are within EU limits, but in Rupert's Valley some results were below the EU limit, but not all. *See section 6.2.1.*
Incidents of noise emissions over prescribed limit	No exceedances over permitted limits recorded	No	No	*See section 6.2.3.*
Incidents of vibration (peak particle velocity) readings over prescribed limit	No exceedances over permitted limits recorded	Yes	Yes	No complaints received and so no measurements done. *See section 6.2.4.*
Incidents of water quality over prescribed limit	No exceedances over permitted limits recorded	Yes	Yes	Water quality remained within acceptable limits. *See section 6.2.2.*
Incidents of significant accidental spills (oil, diesel, concrete)	No level 3 incidents or greater involving accidental spills	No	Yes	No level 3 incidents were recorded. *See section 3.3.*

KPI	Description	Assess-ment rating 2015-16	Assess-ment rating 2016-17	Comments
Total land used for project outside of Airport Development Area (ADA) boundary.	Additional land taken by the project must not exceed 10%of the total ADA	Yes	Yes	No additional land take during the period.
Incidents of illegal driving, plant collection, animal trapping	No level 3 incidents or greater occurred	No	Yes	No level 3 incidents occurred. *See section 3.3.*
Rare and endangered species affected (excluding Wirebirds)	No level 3 incidents or greater involving biodiversity issues	Yes	Yes	No level 3 incidents occurred. *See section 3.3.*
Number of Wirebird territories disturbed	No displacement of Wirebirds beyond the ADA	Yes	Yes	Wirebird numbers are increasing. *See section 6.2.8.*
Biocontrol measures are in place	No contaminated containers allowed onto the island	Yes	No	No biosecurity incidents occurred with containers, but Namibian Ice Plant has entered the country through the importation of river sand and has been found germinating in several places. *See section 6.2.11.*
Land rehabilitated as per LEMP	Number of specifications completed	Yes	Yes	*See section 5.4.*

1 INTRODUCTION

This is the fifth Annual Environmental Report (AER) for the St Helena Airport Project, reporting on construction work (Phase 1) for the period 1st July 2016 to 30th June 2017. The first Annual Environmental Report for airport operations (Phase 2) is provided in a separate document.

The year has been characterised by the winding down of construction activities and the associated rehabilitation of disturbed areas. Several sites have now been handed over from Basil Read (BR) to the St Helena Government (SHG) and these are no longer monitored by the environmental team. However, the LEMP team has been hard at work transforming these bare areas using indigenous species to create new habitats.

A large part of the decommissioning work included a massive effort by all concerned to remove tonnes of construction waste to its various designated disposal sites. Anyone driving past Bradley's, for example, will notice a significant difference: the BR workshop, which has been a hive of activity for the past five years, has been closed down and handed back to SHG, and the temporary waste storage area surrounding the workshop has been cleaned up and graded.

By the end of the year, construction work was focussed on the bulk fuel supply system in three key areas: the Airport Fuel Facility (AFF), the Bulk Fuel Installation (BFI) in upper Rupert's Valley and the Bayside facility and pipe gantry at the old Solomons sites in lower Rupert's Valley.

During the reporting period BR established and maintained their commitment to responsible environmental stewardship, and to minimising and eliminating potential adverse environmental impacts. This was achieved by putting in place the necessary human and financial resources to implement the environmental requirements specified in the Design, Build and Operate Contract.

Duty of care to the environment and compliance with the Contractor's Environmental Management Plan (CEMP) are the responsibility of the entire construction team. The role of the environmental management team is to ensure that all staff practise good environmental management and stewardship, within the time and budgetary constraints which are inevitably part of such a large capital project.

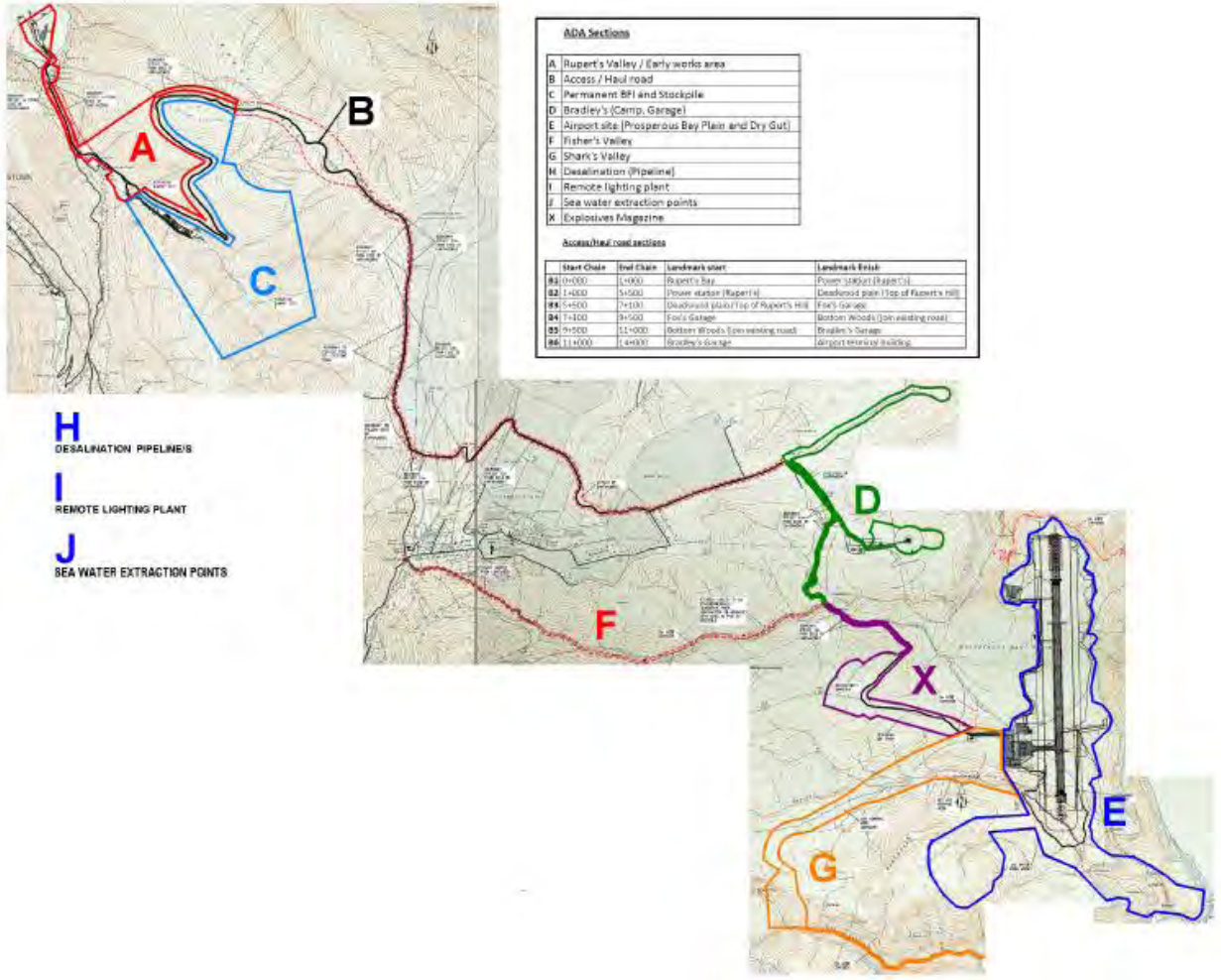


Figure 1: Map of the airport works areas

Figure 2: Map of island showing the location of navigational aids and communications systems

Table 1: Airport construction work areas and status as of end June 2017

Designation	Area name	Construction works	Construction status at end June 2017
A	Rupert's Valley	• Temporary jetty • Public road upgrade • Workshops • Laboratory • Laydown areas, • Temporary fuel facility (TFF) • Permanent wharf access road • Permanent wharf • Lower quarry • Sea Rescue Building • New slipway	• Complete • 90% complete except for Bayside BFI access • Being used as Stores • Used by BR for concrete testing • Complete, operating • Part operational; part decommissioned • Complete • Complete (minor repairs) • Quarry area used for spoil deposition; landscaping not complete • Complete • Complete (minor repairs)
B	Access / haul road	• New construction from wharf to BFI Junction • New construction/upgrade from BFI Junction to Reggie's • New construction from Reggie's to airport car park	• Complete • Complete (minor repairs) • Complete
C	Upper Rupert's Valley	• Permanent bulk fuel facility (BFI) • Road spoil area • Concrete waste disposal area • Concrete batch plant for wharf • Laydown area for CORE-LOC units and block walls for wharf • Drainage diversion channel • BFI offices and lab	• 45% complete • Complete, to be rehabilitated • Complete, operating • Complete, operating • Being used for other temporary storage • 80% complete • 98% complete
D	Bradley's	• Temporary Contractor's camp • Workshop • Temporary waste disposal and recycling area • Bioremediation pad	• Complete, operational • Handed back to SHG • Decommissioned and reinstated as per LEMP • Decommissioned
E	Prosperous Bay Plain (PBP) and Dry Gut	• Runway and taxiway • Combined building • Terminal building • Ancillary airport buildings • Apron • Car park and entrance area	• Complete, operational • Complete, operational • Complete, operational • Complete • Complete, operational • Complete, operational • Complete, operational

Designation	Area name	Construction works	Construction status at end June 2017
		• Doppler VHF omni-directional radar (DVOR) beacon and VHF mast • Redundant localiser mound • Permanent electricity/water supply • Fire training rig • Airport fuel facility	• To be shaped • Complete, operational • Complete, operational • 72% complete
F	Fisher's Valley	• Cook's Bridge crossing	• Complete
G	Shark's Valley and Upper Dry Gut	• Permanent borehole (B/h 5), water reservoirs and pump stations in Dry Gut	• Borehole 5 operational – handed over to Connect in April 2017; permanent pumps, reservoir and piping complete
I	Around airport	• Remote obstacle lights 1-12 • VHF mast at Blue Hill	• Complete, operational • Complete, operational
X	Tungi Flats	• Explosives magazine • Borrow pit	• Decommissioned, re-profiled, topsoiled • Decommissioned, re-profiled, topsoiled

2 AIMS AND OBJECTIVES OF THE ANNUAL ENVIRONMENTAL REPORT FOR PHASE 1: CONSTRUCTION

This AER presents an overview of the environmental performance of the airport contractor (Basil Read) during Phase 1: Construction, over the reporting period 1st July 2016 to 30th June 2017. The report is structured as follows:

- The environmental governance structures (Chapter 3);
- Our progress in building relationships with our stakeholders (Chapter 4);
- An overview of some of the environmental work undertaken during the year (Chapter 5);
- Our environmental monitoring activities (Chapter 6); and
- The targets and challenges for the 2017-18 year ahead (Chapter 7).

A summary of performance and progress against key performance indicators is presented in the Executive Summary.

3 ENVIRONMENTAL GOVERNANCE STRUCTURES

3.1 Environmental Management Team

Environmental management of the airport construction project is the responsibility of a dedicated team of on-island and off-island staff. The CEMPC is based in South Africa and is responsible for liaison with the BR design team in South Africa, the six-monthly audits, updating the CEMP, preparing the AER and providing ongoing advice about environmental issues to BR management and the CECO, Annina Hayes. The CECO is based full-time on the island and she has a team of 2 field staff to carry out environmental inspections, monitoring and waste management (Table 2). The number of environmental staff has reduced from previous years in line with the substantial completion of most construction work. The CECO reports directly to the CEMPC and the on-island Safety, Health, Environment & Quality (SHEQ) Manager (Figure 3).

Table 2: Environmental management team (as at 30th June 2017)

Name, position and location	Tasks
Bryony Walmsley CEMPC	CEMP updates; 6-monthly audits; preparation of the Annual Environmental Report; input to design; ongoing advice
Annina Hayes CECO	Team manager Quarterly reports; attendance at project meetings; inputs to design; site walkovers; implementation of the CEMP; environmental monitoring and day to day auditing; liaison with PMU; Community Liaison Officer
William Crowie	Responsible for waste management and disposal; environmental monitoring
Brian Joshua	Responsible for waste management and disposal; environmental monitoring

Supervising the entire airport project on behalf of the St Helena Government (the Employer), is the Project Management Unit (PMU). The PMU team used to include a full-time Environmental Monitor who was appointed for the duration of the Contract to oversee all environmental management activities. Due to the fact that most large-scale construction work had been completed by mid-2016, the Environmental Monitor left the island at the end of August 2016 and day-to-day environmental supervision was taken over by the PMU's Project Manager and Health and Safety Manager. Meanwhile the Environmental Monitor has continued to review key documents produced by the CECO and CEMPC.

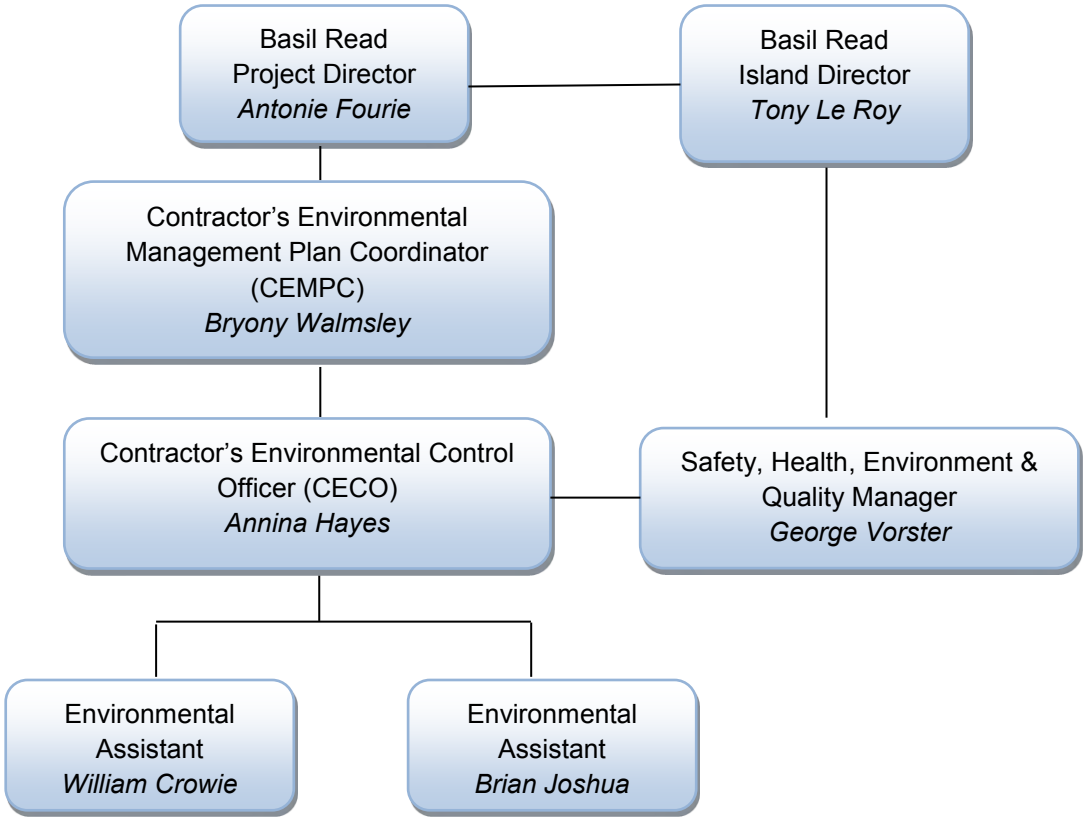


Figure 3: Basil Read environmental reporting structure as at end June 2017

3.2 Environmental Management Plans

As reported in previous AERs, environmental management on site is controlled by a hierarchy of plans:

- The **Environmental Management Plan** (EMP);
- The **Contractor's Environmental Management Plan** (CEMP) which is updated on an ongoing basis with formal acceptance by PMU every six months to ensure that it is responsive to the evolving nature of the construction site; and
- Various **protocols, procedures and management plans** are added as appendices to the CEMP as and when the need arises.

3.3 Compliance Monitoring and Auditing

There is a comprehensive system of compliance monitoring and auditing in place on site:

3.3.1 Site walkovers

Prior to new sites being developed, site walkovers are conducted by the CECO, relevant BR manager, PMU, SHG and any relevant local specialists or interested parties to determine the key environmental issues of concern. The aim of the walkovers is to highlight any environmental constraints, as well as areas of ecological sensitivity that might be affected by the activity.

The number of walkovers during the past year has diminished significantly, commensurate with the reduction in the scope and scale of major new construction works. Site walkovers have taken place for the following three activities:

- Rupert's wharf access road;
- The feeder fuel line from the BFI in upper Rupert's Valley to the power station; and
- The Bayside fuel line gantry.

Each of these is described briefly below.

Rupert's wharf access road
In order to facilitate access to the permanent wharf by container stacker cranes and other large equipment and vehicles, the point where the access road crosses through Rupert's Lines needed to be widened. A site walkover took place on 18th July 2016 to discuss two possible options: a 4 m wide road, which would require the removal of approximately 2 m of the old masonry wall against the mountainside; or a 6 m wide road, requiring the removal and reconstruction of 8 m of wall. The wider option was selected on the basis of sight lines and traffic flow considerations.

The main environmental issues included the need to preserve as much samphire as possible, because the plants provide habitat for a variety of rare invertebrates, and the removal and reinstatement of the historically-important wall. The fortifications of Rupert's Lines used to extend in an unbroken wall, linking in to the stone-packed retaining wall to the south and west. It is thought that the wall was broken in about 1840 and the current access track passes through this breach. The edge of the stone-packed retaining wall was not repaired, or it has deteriorated with time, and was in an unstable state. The remainder of the wall was in a surprisingly good condition, given the loading from the slope above.

A method statement was drawn up to describe how the old stone wall would be removed, the cladding stones stored, and how they would be replaced. Due to the height of the wall, it was decided that an excavator should be used to gently dismantle the top sections of the wall in the interests of worker safety, but the lower sections were removed by hand in order to minimise damage to the old stones. In view of the possibility of the slope above the wall becoming unstable, rock guards were on hand and strict safety measures were applied to protect the work site. The work proceeded as follows:

- Participants were briefed on the methodology, scope and purpose of the heritage and archaeological watching brief, and what finds could be expected;
- The entire wall was photographed i.e. the section to be removed as well as the remaining parts;
- The exact position of the cut in the wall was marked and surveyed;
- The excavator was positioned facing the western façade of the wall and a TLB was positioned facing the southern façade of wall. The excavator gently nudged small sections of wall into TLB bucket (Plate 1);
- The stones were removed in <1m sections to prevent mass collapse of the wall and damage to salvageable stones (Plate 2);
- The salvaged stones were stored separately for re-use;
- Once all the stones were removed from the cut section, the remaining wall was photographed and checked for any unintentional damage due to removal works;
- Once the slope was cut back the required distance, a reinforced concrete wall was erected and stone masons replaced the cladding stones to blend in with the existing wall (Plates 3 to 5).

A full archaeological watching brief was in place during the excavation of material situated below the wall in a section of cut in case any other heritage or archaeological finds were encountered. The transitional wall and cladding works were carried out by a local contractor, West Coast Construction, with experience and certification in built heritage restoration.

Plate 1: Positioning of excavator and TLB for careful and safe removal of the wall

Plate 2: Manual loading of salvageable stones to prevent damage

Plate 3: Commencement of re-cladding works

Plate 4: Re-cladding works nearly completed

Plate 5: Completion of re-cladding works. Note tie-in to old wall on the centre right of the photograph

Feeder fuel line to the power station

A first walkover for the new fuel pipeline route from the BFI in upper Rupert's Valley to the existing power station took place on 24th June 2016, but because many of the key stakeholders were not in attendance that day, a second walkover was conducted on 19th October 2016 with all major stakeholders present (Plate 6). Two possible routes were described to the attendees and BR was asked to also consider a third route to try and avoid the old slave burial areas. A fourth option – transporting fuel to the power station using a road tanker, was also added to the list of alternatives. BR conducted an alternatives analysis to try and optimise the financial and technical considerations (such as pipeline length, number of bends and slope) and to minimise the negative environmental impacts, especially on the burial sites. The transfer of fuel by road tanker was eliminated from further consideration due to the high transportation costs, while the route identified by stakeholders was found to be flawed due to the presence of Connect infrastructure. The final route will traverse a short section (approximately 4 m) of the potential burial area, but the pipeline will be placed above-ground on plinths and no intrusive ground works will be necessary (Plate 7).

Plate 6: Stakeholders at the walkover for the power station fuel feeder line

Plate 7: Preferred route (dashed red line) for the feeder pipeline to the diesel power station in Rupert's Valley

Bayside fuel gantry

This walkover, conducted on 9th February 2017, was a follow-up to the previous Bayside BFI walkover held in March 2016. The purpose of the follow-up walkover was to focus on the design, construction methods and environmental impacts associated with the construction of the new fuel gantry on the coastline to replace the existing gantry used to bring the fuel pipeline onshore. The key issues identified by the stakeholders who participated in the walkover included: the need to protect the old Boer desalination plant chimney and the remaining parts of Rupert's Lines, the potential for historic and marine archaeological finds, sedimentation in the bay, waste and pollution, and access to the beach and fishing spots. A method statement was prepared to ensure that these issues would be addressed during construction.

Plate 8: Creation of a coffer dam to protect the gantry construction site from wave action

Plate 9: Location of the new pipeline gantry (orange line) in Rupert's Bay

3.3.2 Workplace inspections

Workplace inspections are conducted by the CECO team every week and the findings are captured in the weekly submission to the PMU. The weekly audits are site-specific and are carried out with the site manager or the foreman in charge.

3.3.3 Site inspections and incident reporting

Site inspections are carried out on a daily basis by the CECO team and any environmental incidents are noted in the CEMP log and reported to the PMU within 24 hours of the incident occurring. Any observations noted by the CECO are communicated to the site foreman in charge at the time of the inspection. The PMU also conducts site inspections and issues Site Observation notices, or the more serious Non-conformance Notices (NCNs) to BR for corrective action. The Site Observations and NCNs and the signed close-out reports on actions taken, are all saved onto the document control system.

Thirty-eight environmental incidents were recorded during the 12-month reporting period and all have been successfully closed out. This total is six incidents fewer than the previous year, and the lowest yet, which is encouraging and reflects positively on the efforts made by the environmental team to manage the most common incidents – spills and waste management. However, it should also be noted that the intensity of construction has decreased significantly and fewer incidents would be expected. The incidents are rated on a scale of 1-5 (
Table 3).

Table 3: Incident rating scale

Loss type	0 No risk	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
Harm to people (safety & health)	No risk to health and safety	First Aid case;	Medical treatment; Exposure to minor health risk	Lost time injury; Reversible, moderate impact on health	Single fatality or loss of quality of life; Irreversible impact on health	Multiple fatalities; Impact on health ultimately fatal
Environ-mental impact	No environ-mental impact	Possible risk to the environment	Reversible damage to the ecosystem	Moderate environmental harm or degradation of the ecosystem	Major environmental harm; Legal non-compliance	Irreversible, significant environmental harm; Loss of species; Ecological disaster
Impact on reputation	No risk	Slight impact; public awareness but no public concern	Limited impact; Local public concern	Considerable impact; Regional public concern	National impact; National public concern and outrage	International impact; Major public outrage

A summary of these incidents is provided in Figures 4 and 5 below.

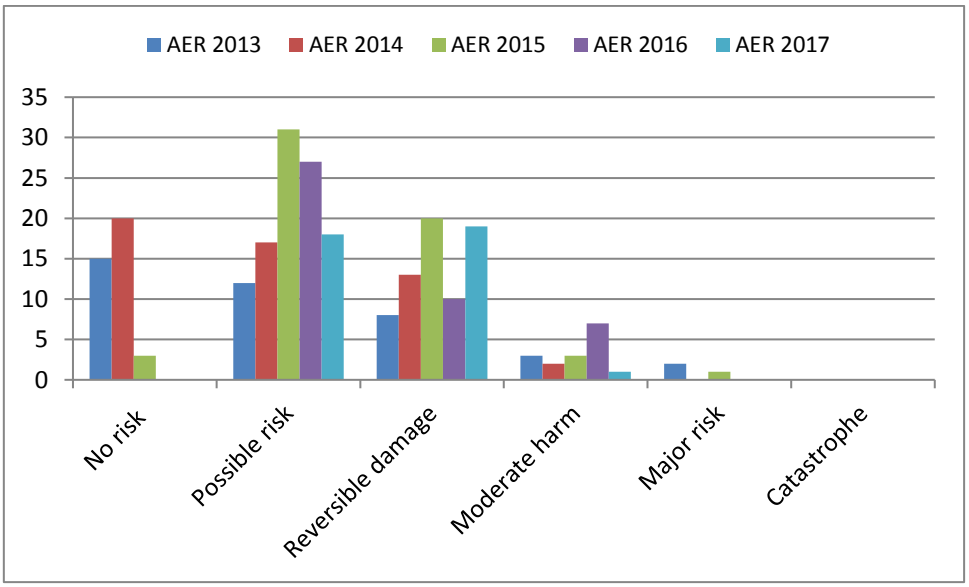


Figure 4: Number of incidents by level of severity

Of the 38 recorded incidents, it can be seen that the majority (97%) involved no damage or low to minor reversible harm to the environment. However, project activities caused one incident which had a moderate impact on the environment and airport safety over the past 12 months, namely a continued proliferation of pigeons at Bradley's camp (Figure 4). The camp is close to the airport and it is not in the interests of airport safety for flocks of pigeons to congregate so close by.

Figure 5 shows the number of incidents by type. Incidents involving waste management (40%) and hydrocarbon spills and leaks (24%) were the main contributors to the total, with poor bitumen management continuing to be a problem. All contaminated soil was taken to the bioremediation pad at Bradley's workshop or the Horse Point Landfill Site (HPLS) and all polluted sites were remediated. Although few in number, incidents relating to health and safety and invasive vegetation were higher than in the previous year, but no incidents relating to: air quality, chemical spills, marine environment, heritage, land take, water quality, roads and traffic, pests and predators or community liaison issues were recorded this year (Figure 5).

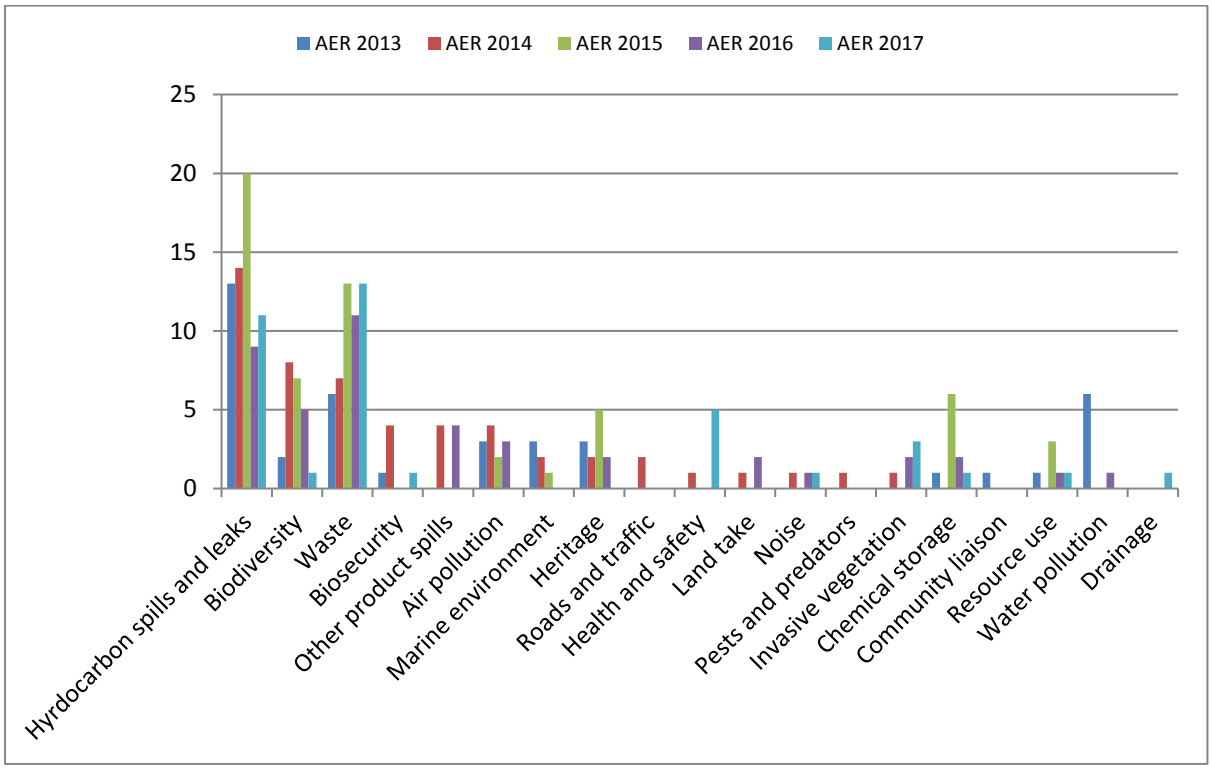


Figure 5: Number of incidents by type

As might be expected, most incidents (50%) occurred in upper Rupert's Valley (Area C), where most construction work is now concentrated (Figure 6). Six incidents were noted in Area D where Bradley's camp and workshop are located, with four incidents each in lower Rupert's Valley (Area A) and the airport site (Area E), where some construction work is still occurring.

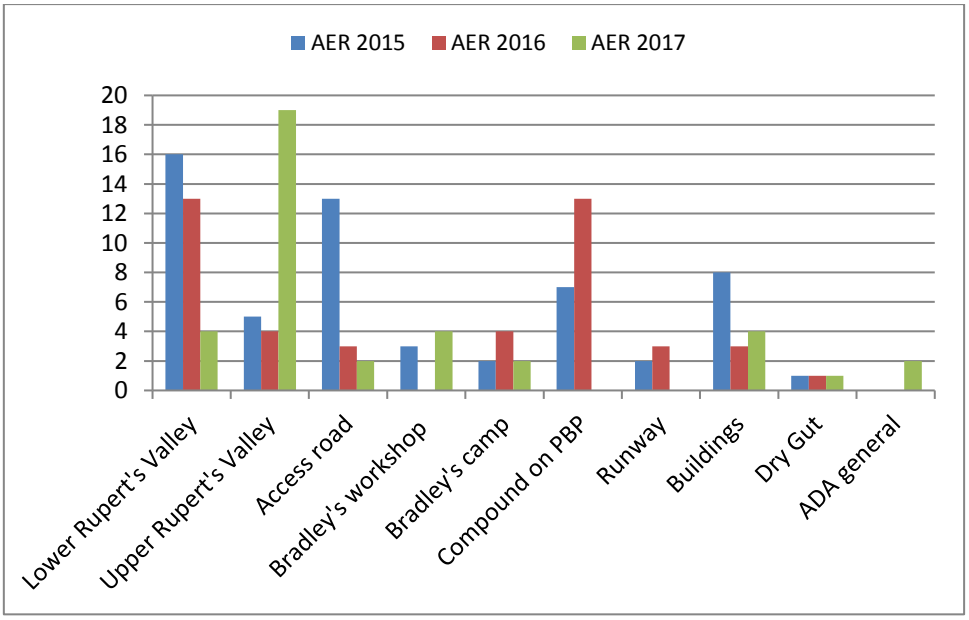


Figure 6: Number of incidents by area

3.3.4 Basil Read audits

The Contract requires a full site audit to be conducted by the CEMPC every six months during the construction of the permanent works phase. Thus, audits took place in July/August 2016 and again in February 2017. Construction audits will continue until all construction works have been completed.

There was a significant decrease in the number of major findings observed during the July/August 2016 audit – from 18 recorded in the February 2016 audit to three, and this downward trend continued into February 2017 (Figure 7). The major findings in July/August 2016 related to leaking Chryso containers (Plate 10) and excessive noise and dust in Rupert's Valley, while the February 2017 audit recorded noise in Rupert's Valley and incorrect storage of leaking bitumen drums as the two major findings (Plate 11).

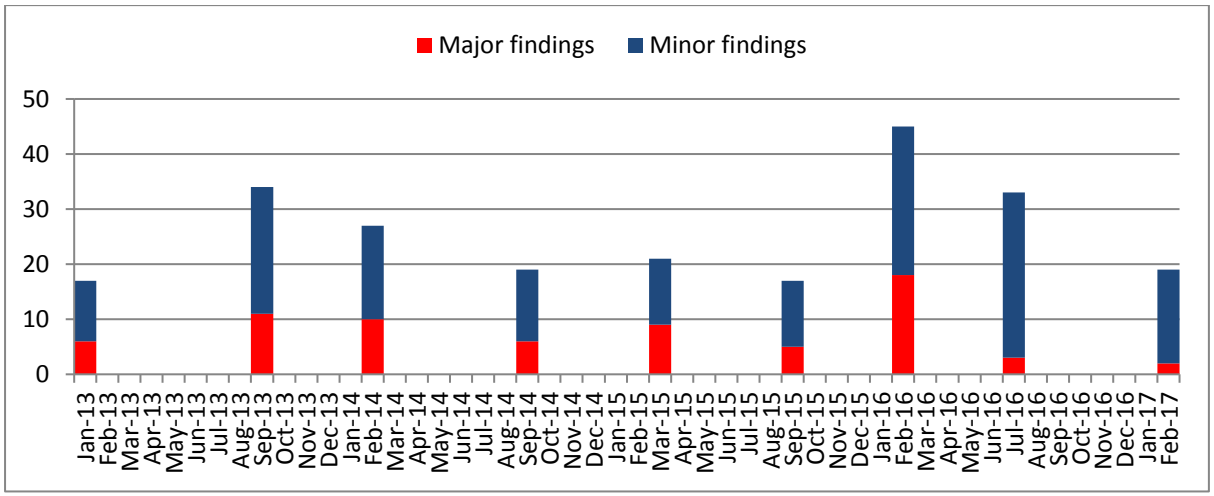


Figure 7: Audit findings

Plate 10: Poor management of Chryso spillage at the AFF site observed during the July 2016 audit

Plate 11: Poor management of bitumen containers and spillage in upper Rupert's observed during the February 2017 audit

After each audit, the CEMPC compiles an audit report, listing the major and minor findings, together with an action plan to rectify the problems. In most cases the issues are rectified promptly and closed out (see Table 4).

Table 4: Status of close-out of audit findings

Audit date	No of major findings	Status as at next audit			No of minor findings	Status as at next audit		
		Closed out	In progress	Not adequately addressed		Closed out	In progress	Not adequately addressed
Jul/ Aug 16	3	1	1	1	30	22*	4	3
Feb 17	2	1	0	1	17	13	2	2

* One finding was later identified as a LEMP responsibility

Over the course of the two audits, the auditor also noted some significant improvements on site and areas of good environmental practice. These included:

- General litter management and control at most sites;
- Adherence to the Heritage Protocol on encountering human remains in Rupert's Valley, while decommissioning the temporary water reservoir;
- The proactive protection works of the Boer desalination chimney (Plate 12);
- Improvements in spill control measures;
- Removal of significant quantities of construction waste from upper Rupert's Valley and Bradley's workshop to the Horse Point Landfill site bulky waste and hazardous waste cells (Plate 13 A and B); and
- Ongoing pest and predator control and removal of invasive plants.

Plate 12: BR fabricated and installed support bracing for the old Boer desalination plant chimney in Rupert's Valley to protect it from nearby construction works

A

B

Plate 13A: All drums and other waste which were temporarily stored next to Bradley's workshop have been moved to the hazardous waste cell at Horse Point Landfill and the temporary storage area cleaned up (Plate 13B)

3.4 Meetings and Reporting

Members of the environmental team attend a number of project meetings to raise issues and to ensure that environmental management actions are implemented where necessary:

- Weekly environmental meetings (on island) with BR, SHG, Access Office and PMU. These ceased with agreement from all parties after the Environmental Monitor left the island at the end of August 2016;
- Monthly environmental management meetings (conference call with BR, DfID, SHG, Access Office, CEMPC and PMU) until the end of March 2017, when they were terminated on request from PMU;
- Bi-weekly communications meeting (on island);
- Weekly production meetings (on island);
- Monthly project meetings (on island), where environmental issues are a standing agenda item; and
- Ad hoc technical meetings (off island).

In addition to the meetings listed above, the environmental management team issues the following reports on a regular basis:

- Weekly environmental report. This was issued up to the end of November 2016, but since then, the CECO provides a weekly email update to the PMU Manager for inclusion in his weekly report to the Employer;
- Quarterly environmental report;
- Six-monthly audit report;
- AER.

All these reports are submitted to the PMU for acceptance and then distributed to on-island and off-island BR management personnel, SHG and DfID. During the reporting period, all of the required reports were submitted as per schedule. Audit reports were issued by the CEMPC immediately after each 6-monthly audit.

The 2015-16 AER was presented to the public on the island by the Access Office at one of the Stakeholder Engagement Forum (SEF) meetings and it is available on the Access Office website (www.sainthelenaaccess.com). This report for the 2016-17 period will be made available through the same channels.

4 BUILDING RELATIONSHIPS WITH STAKEHOLDERS

4.1 Employment and Employee Development

4.1.1 Employment and income

Basil Read is the largest private employer on the Island. As at the end of June 2017, a total of 236 people were employed directly or as sub-contractors on the project of which 96 (41%) were Saints, 11 were Saint contractors and 129 were expatriates employed by BR, many of whom were contracted Thai workers (Figure 8). Included in this total were 27 Saints who have returned from abroad to work on the project. The proportion of Saints working on the project is down from 60% a year ago due to the significant reduction in construction works; the total number of people employed at the end of June 2017 was only 236, compared to the 609 employed at the peak of construction in 2014 (Figure 8).

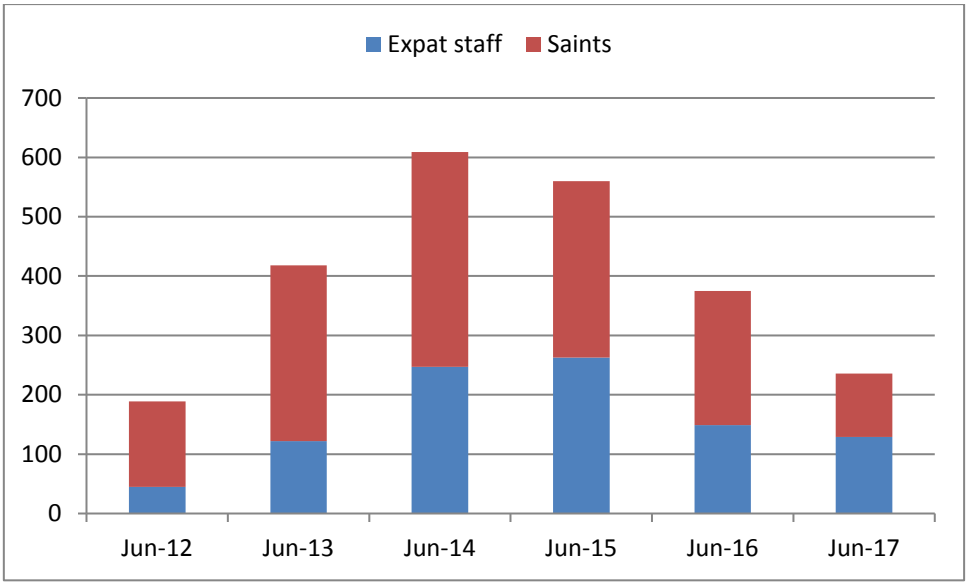


Figure 8: Ratio of Saint and expatriate staff (including Saint sub-contractors)

Employment opportunities impacted on all age and gender groups which was made possible by our commitment to provide certified training and imparting of skills to Saints wherever possible, as opposed to sourcing skills elsewhere. Twenty-nine Saints over 60 years of age and 18 female Saints were employed as at the end of June 2017.

Since inception, the project has contributed £2.76 million in taxes and paid £15.07 million in wages and salaries to staff. Local businesses have been extensively utilised for the provision of engineering, retail, cleaning, construction and other services to the project, amounting to a cumulative total of £6.98 million. As the number of expatriate staff declines as the project winds down, the number of house rentals is also dropping – at the end of June 2017, only 19 houses were being leased compared to 25 in the previous year. House rental income plus other leases from SHG (e.g. Bradley's Garage, Longwood offices) have yielded an accumulative amount of £1.38 million in rent. The ongoing employment of Saints on the airport project together with over a hundred expatriates still resident on the Island has resulted in increased spending in the local economy, however the delay in the commencement of commercial flights to the Island is causing some economic hardship and less optimism than in previous years.

4.1.2 Training and employee development

All new permanent staff, visitors and sub-contractors are required to undertake the basic induction and HIV awareness training, and all permanent staff have to participate in an annual re-induction training course. Over the course of the year, 69 people underwent the initial induction training and 141 staff attended the annual re-induction course.

Due to the specialised nature of the bulk fuel facilities' commissioning work, a new induction training programme focussing on the specific issues associated with the fuel facilities was developed and presented to 71 staff.

In addition, training was given on the following topics:

- Environmental risks and management of spills for all personnel working and associated with AFF commissioning (SHG, Solomons, Penspen, PMU, SmartJet);
- The identification and safe removal of Namibian Ice Plant (see section 6.2.10) for airport and CECO teams;
- Incinerator operation and management (CECO staff).

The SHEQ Manager and CECO give weekly toolbox talks to all construction teams to raise awareness on specific safety, health and environmental issues – the latter usually held after an environmental incident e.g. disposal of waste concrete, off-road driving. Some of the topics covered during the year included:

- World HIV/AIDS Day and HIV testing (all staff);
- Sexually transmitted diseases and infections (all staff);
- Mental health awareness (during mental health awareness week) (all staff);
- Correct use of ablution facilities and toilets (Thai workers);
- Waste reduction on site (for SmartJet employees);
- Hydrocarbon spill response management (SmartJet);
- Community engagement (SmartJet);
- Protection of natural and cultural resources (SmartJet);
- Rupert's noise levels (workshop staff);
- Namibian Ice Plant (site managers, logistics personnel).

4.1.3 Safety

Up until the end of June 2017, a total of 5,720,087 manhours have been worked on the project. In this time (since early 2012), a total of 472 health and safety incidents have occurred, of which only six resulted in lost time injuries, totalling 473 hours lost. This represents only 0.0083% of the total hours worked.

4.2 Corporate Social Responsibility

With the winding down of construction and the reduction in the number of expats involved with Island life, the level of engagement in community projects has diminished slightly. Nevertheless, BR still contributed to a number of activities and functions. For example, BR became actively involved with the Island-wide District Clean-up Initiative by delivering tyres to Longwood Green and providing a digger to excavate the flowerbeds along the Longwood Avenue to support their 'local' district clean-up project (Plates 14 and 15).

Plate 14: BR provided a digger (upper left of photo) to excavate the flower beds along the Longwood Avenue

Plate 15: The Avenue after the beds were replanted with colourful flowers

BR also donated four dozen bottles of water for the annual Festival of Running, as well as chicken pieces for the St Mark's & St Mathew's Church Fête.

Another project undertaken during the year was assisting the Museum to spray-paint two cannon and transport them to the Airport precinct where they were placed on re-fashioned gun carriages (Plate 16).

Plate 16: BR spray painted two cannon and transported them to the Airport precinct

In July 2016, BR assisted in the construction of a concrete plinth on the Meteorological (Met) Station. A section of drainage pipe was positioned and concrete poured, creating the plinth so that the Met Station could install a NASA Aerosol Robotic Network (AERONET) instrument (Plates 17 and 18). This measures aerosol properties in the atmosphere by tracking the sun for research and satellite validation. Shortly after the instrument was installed, NASA scientist David Giles visited to register it onto the AERONET network.

Plate 17: Conducting checks with the Met Station team (L-R David Giles, Garry Mercury and Marcos Henry) AERONET Site at Saint Helena Island
(Photo: D Giles)

Plate 18: The NASA Aerosol Robotic Network instrument installed at the Met Station

Another initiative undertaken by BR has been to help private contractors set up and manage their own businesses. For example, Geoffrey Ellick and Julian Fowler, of Brick and Block, have taken over the running of the Rupert's concrete batch plant and they now provide concrete and paving blocks to BR and the public.

Plate 19: Julian Fowler and Geoffrey Ellick of Brick and Block

4.3 Milestones

With the airport and wharf both completed and handed over to the Operations team and SHG respectively in May 2016, construction work has focussed on the completion of the access road and

the commissioning of all the bulk fuel facilities at the Bayside location in lower Rupert's Valley, the upper Rupert's BFI and the AFF.

The bulk fuel facilities are complex structures and have taken longer than expected to complete. For example, there are 19 km of electrical cables and 28 km of instrument cables in the BFI complex alone, together with 173 safety and process instruments to measure fuel flow rates, pressure, etc.

The commissioning of the fuel facilities is a time-consuming and lengthy business which involves testing every section of pipe requiring in excess of 800 isometric drawings encompassing 310 line tests, all ±2,000 valves, eight bulk fuel storage tanks, 3 break tanks, 3 interface tanks, 1 slops tank, and a 2 million litre firewater tank. The ground fuel piping is tested using water and air dried prior to reinstatement whilst the Jet A1 piping is pneumatically leak tested prior to the introduction of Jet A1 for hydraulic testing. Prior to commissioning tests starting, all of the approximately 3,000 welds were radiographed to check for competence.

On 1st July 2016, the MV Greta made history as the first commercial ship to dock at the new wharf in Rupert's (Plate 20). The ship was chartered by BR to bring in and take out construction materials and equipment.

Plate 20: MV Greta was the first commercial ship to dock at Rupert's wharf on 1st July 2016 (Photo: Access Office)

There has been considerable progress on the access road, with most sections now complete except for some snagging, a few drainage issues and final road line marking. Although the road has not yet been officially handed over, some of the highlights from the road are reported below.

In August 2016, the old access road to the Met Station, Millennium Forest and Horse Point Landfill was ripped up, regraded and topsoiled so that it could be incorporated into the adjacent Millennium Forest (Plate 21). Access to these locations is now via new intersections from the main road (Plate 22).

Plate 21: The old access road to the Met Station, Millennium Forest and Horse Point Landfill has been ripped and topsoiled by BR and planted with gumwoods by LEMP to extend the area of the Millennium Forest

Plate 22: New intersection to Millennium Forest and the landfill

The old road through the residential area of Rupert's Valley was provided with a concrete surface in November 2016 (Plate 23). Our monitoring has shown that the amount of dust and vehicle noise has reduced considerably (see sections 6.2.1 and 6.2.3). When BR vacated Bradley's workshop, they graded and gravelled the access road to the adjacent residential area (Plate 24).

Plate 23: New paved road through lower Rupert's Valley

Plate 24: New access road to Bradley's residences

After years of noise, dust, vibration and general disturbance, the road through Deadwood has been completed and all works on the berm separating the service road and the new road, as well as Fox's intersection have been completed (Plates 25 and 26). Other completed intersections include those at Colt Sheds, Reggie's, BFI, Field Road and the Bayside.

Plate 25: The berm separating the Deadwood service road (on left of picture), which provides access to residences and the new airport access road was finished during the last year.

Plate 26: After much negotiation between BR, Fox's Garage and the Deadwood Syndicate, the new intersection has been completed.

The access road to the wharf was also completed during the reporting period (Plate 27), as well as the new Sea Rescue Facility building in lower Rupert's, which was completed in late 2016 (Plate 28).

Plate 27: New access road to the permanent wharf. Note new stone-clad rock trap wall

Plate 28: Sea Rescue Building

4.4 Stakeholder Engagement Forum

Three Stakeholder Engagement Forum meetings were held during the year as follows:

Date	Location	Topics
24 August 2016	Museum	Airport progress and next steps
16 November 2016	Harford Community Centre, Longwood	Airport progress; LEMP
6 February 2017	Museum	Visual comparison of before and after project sites Presentation of the 2015-16 AER

The aim of the meetings is to provide information to affected communities and to listen to issues and concerns raised by the public. The meetings are arranged and chaired by the PMU. Attendance at the meetings is variable, with the February meeting being well attended, while the November meeting only attracted two members of the public.

4.5 Community Liaison

In addition to the Stakeholder Engagement Forum described above, there are various other forms of community liaison. The Access Office provides an update on the airport project every month, which is circulated via the two island newspapers and is available on the Access Office website (www.sainthelenaaccess.com).

From 2012, BR had a full-time CLO who provided a constant communication link between the Contractor, the affected communities, as well as the broader island community. However, since November 2016, the role of the CLO has been taken over by the CECO, Annina Hayes because a full-time CLO was no longer warranted. Nevertheless, there is still a 24-hour hotline and a complaints reporting and recording system in place.

In the twelve month period up to 30th June 2017, a total of four complaints were received, 13 fewer than last year. All four complaints were rated as minor and two were referred to the St Helena Roads Department as they were old complaints that had been previously addressed by BR. As expected, the number of complaints about noise and dust were significantly reduced since most construction work in residential areas has ceased. The one complaint about dust in Deadwood referred to some topsoiling work that was being done on the berm ahead of LEMP replanting. The work was finished the same day and the LEMP team was requested to plant these berms as soon as possible to minimise further dust.

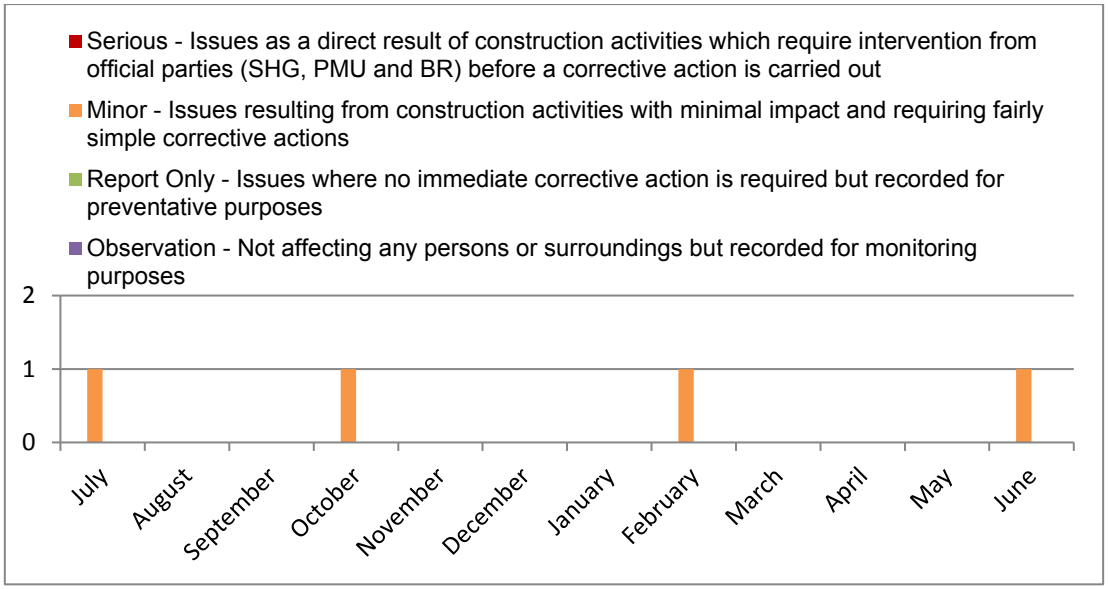


Figure 9: Number and rating of complaints received July 2016 to June 2017

5 ENVIRONMENTAL MANAGEMENT ACTIVITIES

This chapter summarises some of the environmental work undertaken during the reporting period.

5.1 Input to Design

Although the bulk of the design phase is complete, there were still a few project elements being finalised during the reporting period. Environmental issues are considered in the design process through an ongoing process of design iterations, review, site walkovers and comment by various parties such as the CEMPC, CECO, PMU and SHG. Some of the key environmental inputs made during the year are summarised in Table 5 below.

Table 5: Summary of selected environmental inputs to the design phase

Area of development	Areas where environmental inputs were considered during design
A – Lower Rupert's Valley	• Wharf access road through Rupert's Lines • Bayside bulk fuel installation (BFI) commissioning – environmental management requirements • Culvert installation in the Run next to the Fisheries Building
B – Access/haul road	• Drainage control
C – Upper Rupert's Valley	• BFI feeder line route to Power Station • BFI pipeline expansion loops • BFI commissioning – environmental management requirements • Rehabilitation of Upper Rupert's Valley and shaping of valley water course • Decommissioning of Rupert's Quarry and rehabilitation thereof
D – Bradley's	• Site preparation for LEMP planting around workshop

E – Prosperous Bay Plain and Dry Gut	• AFF commissioning – environmental management requirements (Plate 29) • Borehole 5 commissioning and hand-over to Connect • Fire Training Rig effluent discharge system

Plate 29: Deon de Jager, Deon Robbertse and Tony Le Roy during AFF commissioning site visit to discuss environmental management issues

5.2 Studies Commissioned

No new studies or surveys were commissioned during the year under review.

5.3 Feedback on Earlier Studies

5.3.1 Lichen translocation

In the last AER, we reported on some trials undertaken on the translocation of the endemic lichen *Dimelaena triseptata*. The plots were examined recently by the LEMP ecologist and it appears as if the lichens attached to rocks are faring much better than those that were growing as a soil crust. It is likely that the wind has blown the soil crust lichens away.

5.3.2 Marine surveys in Rupert's Bay

The Marine section of the Environmental Management Division (EMD) has conducted several marine ecology surveys of Rupert's Bay in areas between the permanent wharf and slipway (Plate 30). The first survey was conducted before the wharf construction works commenced in May 2014 and four subsequent surveys have been conducted during the construction phase (2014-17). The survey locations were strategically selected for long term monitoring and to date have proven successful (Beard, 2017).

The purpose of the dive surveys during and after the construction phase from the pre-defined survey sites is to comprehensively quantify the habitat and biodiversity abundance and richness of all fish and invertebrate life within the survey area.

Plate 30: The marine surveys take place between the permanent wharf (background) and the slipway (foreground)

The marine ecology surveys conducted in Rupert's Bay show that there is a low diversity of both the fish and invertebrate fauna found on the sand and bedrock areas outside of the wharf footprint and few changes to the species abundance and composition have occurred since before construction began (Beard, 2017).

The habitat survey suggests that there has been a gradual change to habitat makeup, but more surveys are required to provide quantitative data to confirm whether this is a worsening trend or not.

Now that the wharf and slipway have been completed it is recommended that surveys continue at current survey sites. As was recommended in the 2016 survey report, surveys should be expanded to include the inside jetty wall to monitor biodiversity colonisation. The construction of the wharf wall, together with the armour rock and CORE-LOC units has undoubtedly created new habitats, but the degree to which this may have contributed to biodiversity richness needs to be quantified. The 2017 EMD report further recommends that a dedicated monthly monitoring system be put in place to measure sediment depth changes within the bay so that the accumulation can be quantified taking into account seasonal factors. This will help identify the mitigating procedures that *might* be required if sediment continues to accumulate in the bay as it relates to the predicted use of the bay (Beard, 2017). As the wharf has been handed over by BR to SHG, the implementation of these recommendations will now need to be considered by SHG.

5.4 Landscape and Ecological Mitigation Plan

The Landscape and Ecology Mitigation Plan (LEMP) is an important component of the airport project; it formed part of the Environmental Statement and as such is a planning requirement of the airport. It aims to reduce the environmental impact of the airport project through sympathetic design and mitigation activities. This includes habitat restoration and landscaping of areas damaged during *temporary* construction works for the airport project as well as conservation activities in other sites to compensate for the loss of habitat resulting from *permanent* works.

Over the past year BR and the SHG LEMP team have worked closely together to prepare reinstatement sites for planting. A list of the completed site specifications is given in Table 6 below.

Table 6: Summary of BR LEMP activities for the year

Date	Specifi-cation No	Zone and location	BR work required	Status as at end June 2017
17/07/15	020	Permanent electricity supply line from Cook's Bridge to Tungi Flats	Removal of introduced material; gentle ripping of access track; removal of invasive plants within construction footprint; manual track remediation	Track remediation by manual raking to be completed
03/09/15	027	Adjacent to access road from Cook's Bridge to Tungi Flats. LEMP zone 12.1-12.9	Removal of introduced material; removal of invasive plants within the construction footprint; gentle ripping of compacted area	Completed
11/07/16	029	Deadwood berm	Removal of all introduced material; removal of invasive plants within construction footprint; bridging gaps made for previous communal access points; topsoil application to existing and new berms/ barriers; spraying of weeds	Completed
08/10/15	032	Zone 6 Mulberry Gut to Colt Sheds	Removal of introduced material; de-compaction of surfaces by ripping; removal of invasive plants within the construction footprint (manually and spraying by ANRD)	Completed
23/11/15	034	Water supply pipe alignment and track close to the LEMP zone 17 in Dry Gut	Removal of introduced material; removal of invasive plants within construction footprint; ripping of track; returning topsoil to water pipeline once buried and level; track rehabilitation around Borehole 5 pump station	Completed
01/17	041	Sea Rescue building in Rupert's	Excess material removed; sub-base material de-compacted; topsoil applied	Completed
21/04/17	042	LEMP - Zone 10.2 & 10.3 - Bradley's garage	Removal of all introduced material; removal of invasive plants within construction footprint; ripping of compacted surfaces; levelling of ripped areas	Completed; works carried out on residential road reinstatement

With all the equipment (tanks, water bowsers, etc.) delivered by BR to LEMP in terms of Variation Order 37, and a full LEMP team in place, site preparation has moved forward quickly and a number of sites have been planted. In the past year LEMP staff have erected 5.6 km of fencing (mainly rabbit proof fencing) and laid irrigation over 1.3 hectares of land (Plates 31 to 33). More than 27,000 plants have

been planted and mulched, using 17.8 m³ of mulch, with a further 33,000 new seedlings being potted out at the LEMP nursery. Sites planted in Bottom Woods are becoming well established with some self-sown seedlings of native endemic plants beginning to come through (Plate 34).

Plate 31: Fencing and irrigation piping in a new revegetation plot along the road between Reggie's and the Millennium Forest

Plate 32: Fencing, water tanks and irrigation piping in place at the Colt Sheds junction.

Plate 33: Fencing on Pipe Ridge to protect the gumwoods from rabbits (Photo: LEMP)

Plate 34: Emerging self-sown ebony seedlings (Photo: LEMP)

Overall the plant survival rate has exceeded the target of 50% with an average rate for all species being 69%, while for some, survival rate is over 80%. The gumwoods along the road just east of Reggie's are showing significant growth in spite of the drought earlier this year (Plates 35 and 36). Samphire is the only species below the target rate at 36%. This is due to some significant early losses due to inadequate protection against rabbits, as well as flood damage, particularly in Dry Gut (Plate 37).

Plate 35: Gumwoods, ebonies and hair grass in Zone 9.1B in February 2016

Plate 36: Gumwoods, ebonies and hair grass in Zone 9.1B in June 2017

In addition to the reinstatement works, two key pieces of compensatory works have been started. A natural population of endemic scrubwoods at Pipe Ridge has been cleared of invasive weed species and areas fenced to protect the population from rabbits and to try to encourage natural regeneration (Plate 33). The Peak Dale gumwood forest (Plate 38) is being fenced to stop cattle from getting in and thus allowing natural regeneration. This is one of two remaining naturally occurring gumwood forests and was chosen as a compensatory site because some natural gumwood habitat has been affected by the airport access road. LEMP will also support these compensation works with the propagation of endemics for supplementary planting.

Plate 37: Flood damage in Dry Gut which has destroyed some of the planted samphires
(Photo: LEMP)

Plate 38: Mature gumwoods in Peak Dale

6 ENVIRONMENTAL MONITORING

6.1 Monitoring Programme

With the handover of the airport to the Operations staff in May 2016, some of the aspects that were regularly monitored by the CECO team have been handed over to the airport Environmental Officer, e.g. seabirds, water quality, weather conditions. The following environmental aspects were still monitored on a regular or ad hoc basis during the reporting period:

- Air quality;
- Water quality;
- Noise;
- Vibration;
- Building condition;
- Waste types and quantities;
- Resource use;
- Invasive vegetation;
- Pests and predators;
- Biosecurity;
- Visual impact;
- Heritage.

The responsibility for all monitoring lies with the Contractor's Environmental Control Officer (CECO) and the appointed field assistants. The monitoring programme is shown in Table 7.

Table 7: Monitoring frequency

Environmental aspect	Monitoring frequency					Comment
	Daily	Weekly	Monthly	6-monthly	Ad hoc	
Air quality – TSP			X			Ceased in March 2017 when the roads were all sealed.
Air quality – PM10	X					Continuous monitoring at HPLS and Rupert's Valley captured on a monthly basis
Air quality – SO_2, NOx, CO_2 and CO	X					Continuous monitoring at HPLS via in-stack monitor and air quality ambient air monitor. Captured monthly
Water quality and groundwater levels – Borehole 5			X			Ceased in April 2017 on hand over of Borehole 5 to Connect
Water quality – Rupert's tap					X	Connect water being monitored for BFI commissioning and firefighting use
Noise					X	When construction work occurs near residential areas and following complaints
Vibration					X	Working near sensitive structures and following complaints
Building condition					X	Before and after major construction work in a residential area, or when complaints generated
Waste	X					
Resource use			X			
Invasive vegetation			X			
Pests and predators		X				
Marine water quality (turbidity)		X				Ceased in February 2017 with hand over of wharf
Marine species				X		Biannual dive by ENRD
Visual			X			
Heritage					X	Ad hoc, depending on nature of construction work in sensitive areas

6.2 Monitoring Results

6.2.1 Air quality

The main air quality issues on this construction site are dust from roads and construction activities, and gaseous emissions from the waste incinerator. The aspects that we monitored during the reporting period were:

- **PM10:** particulate matter finer than 10 micron (PM10) can enter human lungs and be harmful to health;
- **Total suspended particulates (TSP):** nuisance dust can affect domestic, industrial and agricultural activities, it smothers plant stomata, and can close micro-pores in soil affecting soil micro-fauna;
- **Sulphur dioxide (SO_2):** one of the main emissions from the incinerator is SO_2, which can affect human health if World Health Organisation (WHO) targets are exceeded at receptor points;
- **Oxides of nitrogen (NOx):** another gaseous emission from the incinerator which needs to be monitored to ensure that concentrations are lower than WHO limits;
- **Carbon dioxide (CO_2):** gaseous emission monitored by the in-stack monitor; and
- **Carbon monoxide (CO):** monitored by the in-stack monitor.

We have two PM10 monitors which are moved around the site to respond to particular requests or work activities. However, one monitor was sent off island at the end of October 2016 for calibration and servicing but for logistical reasons, it had not been returned to the island by the end of June 2017. Monitoring with the one instrument therefore focussed on Rupert's Valley on account of the presence of permanent residents and the level of construction activity still being maintained in the valley (Table 8).

Table 8: Air quality monitoring locations and dates

Location of instrument	Period	Reason
Horse Point Landfill	01/07/16 – 19/10/17 29/09/16 – 21/10/16 13/03/17 – 31/05/17	PM10 dust for people working in area Gaseous emissions (when operational)
Rupert's Valley	01/07/16 – 30/06/17+ (except March 2017)[2]	PM10 dust in residential area
Bradley's Bottom Woods Argos, Deadwood Rupert's, Mulberry Gut	01/07/16 – 30/09/16 01/07/16 – 31/10/16 01/07/16 – 31/01/17 01/07/16 – 28/02/17	Nuisance dust

The PM10 results are shown in Figures 10 and 11 together with the European Commission (EC) Directive and WHO guideline limits for daily average PM10 over a year. The average daily respirable dust levels in Rupert's Valley have gone down significantly from August 2016 and now fluctuate in the range 20 – 70 µg/m³/d. This improvement is largely due to the paving of the road through the valley

[2] The filters collected in March were found to be damp (which would adversely affect the results). The CECO cleaned and dried the monitor and tested it for integrity.

which was completed towards the end of 2016. There has, however, still been a considerable amount of construction work going on in the valley which may account for the dust - albeit at much lower levels than in the past. It is also likely that the extremely dry conditions experienced on the island during the summer drought period contributed to the dusty conditions.

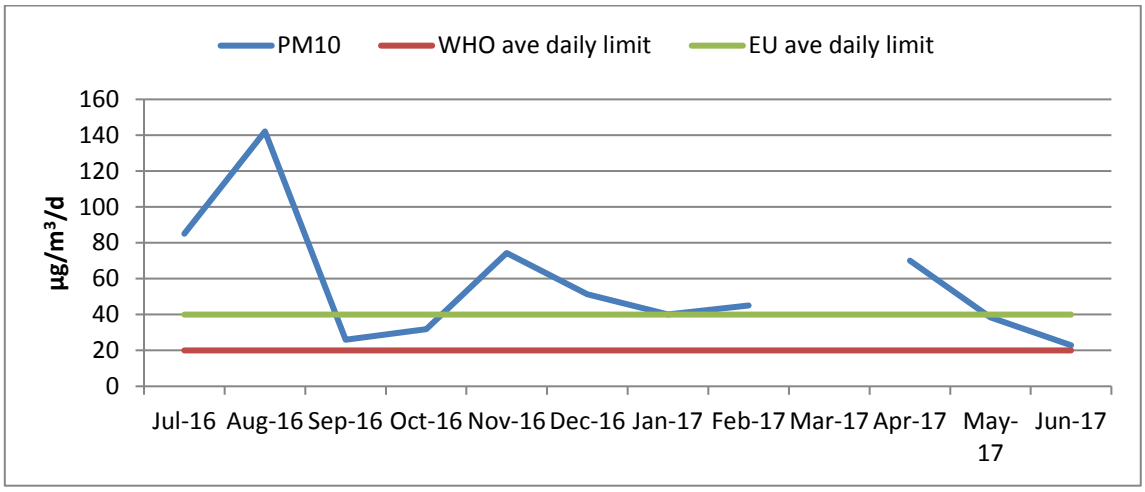


Figure 10: PM10 readings from Rupert's Valley

Respirable dust levels at HPLS for the period July to October 2016 indicate average daily concentrations which exceed the WHO limits but fall within the EU limits (Figure 11).

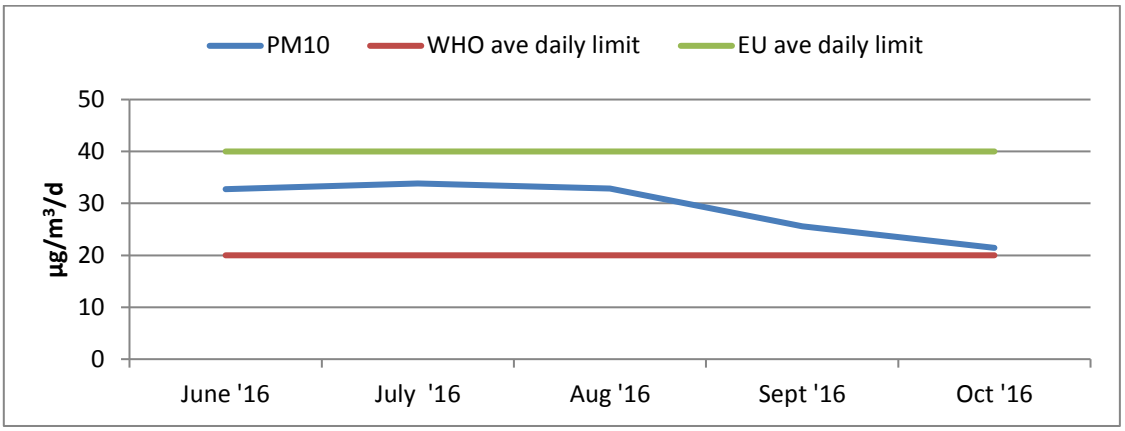
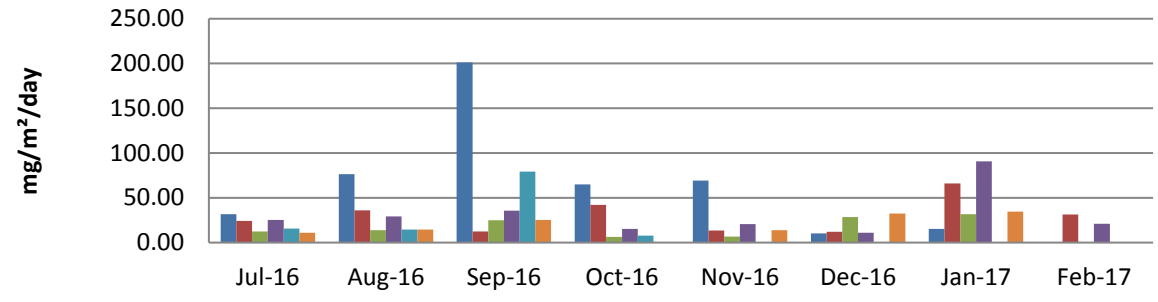


Figure 11: PM10 dust levels at HPLS during incinerator operation

Over the course of the reporting period, monitoring of total suspended particulates (TSP) or nuisance dust has been phased out as construction activity has ceased (see Table 8 above and Figure 12 below). Except for one measurement from September 2016 at the Argos monitoring site, all concentrations have fallen well within the UK limit of 200 mg/m²/day. The cause of the spike in TSP in September was road construction works being carried out in lower Rupert's Valley next to the Sea Rescue building and Argos factory (Plates 39 and 40).



	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17
Argos	31.81	76.32	201.06	64.98	69.20	10.40	15.16	
Rupert's	24.15	35.97	12.44	41.98	13.42	12.14	65.92	31.51
Deadwood	12.51	13.72	24.87	6.38	6.87	28.48	31.64	
Mulberry Gut	25.25	29.12	35.77	15.28	20.56	10.97	90.73	21.06
Bottom Woods	15.48	14.63	79.37	7.69	0.00	0.00		
Bradleys	10.83	14.59	25.43	0.00	13.77	32.48	34.72	

Figure 12: Total suspended particulates

Plate 39: Construction works in lower Rupert's accounted for spike in dust in September 2016

Plate 40: Installing the new culvert for Rupert's Run adjacent to Argos. Note new BFI pipeline on plinths in the background

In April 2016, BR purchased an instrument to monitor gaseous emissions from the incinerator. This instrument was commissioned in May 2016 and has been used to monitor SO_2 and NOx at the HPLS offices when the incinerator was operating between end of September and October 2016 and again from March to the end of May in 2017 (Table 8). The reasons for the intermittent operation of the incinerator are largely due to delays in obtaining responses from the manufacturer regarding optimum loading rates and the types of waste that could be burnt without compromising the optimal functioning of the equipment. As a result, there are gaps in the air quality monitoring data corresponding to when the incinerator was not in use.

The sulphur dioxide and nitrogen oxide emissions from the incinerator were largely within the specified WHO limits of 20 µg/m³/day and 200 µg/m³/hour respectively for the periods that the incinerator was running, except for two notable exceedances (Figure 13). One of these occurred during the month of March 2017, when no incineration was carried out, but background monitoring indicated that these

emissions were caused by vehicular movements in front of the landfill offices near the monitoring position.[3] The other spike occurred on 10 April 2017 during the incineration of fly ash bags. Fly ash bags are of higher density than cement bags and require higher temperatures to achieve efficient combustion. However, safe incinerator operational practices make it difficult to burn waste loads at an efficient combustion temperature of ≥800ºC. If fly ash is used again, the bags will be disposed of in the hazardous waste cell at HPLS.

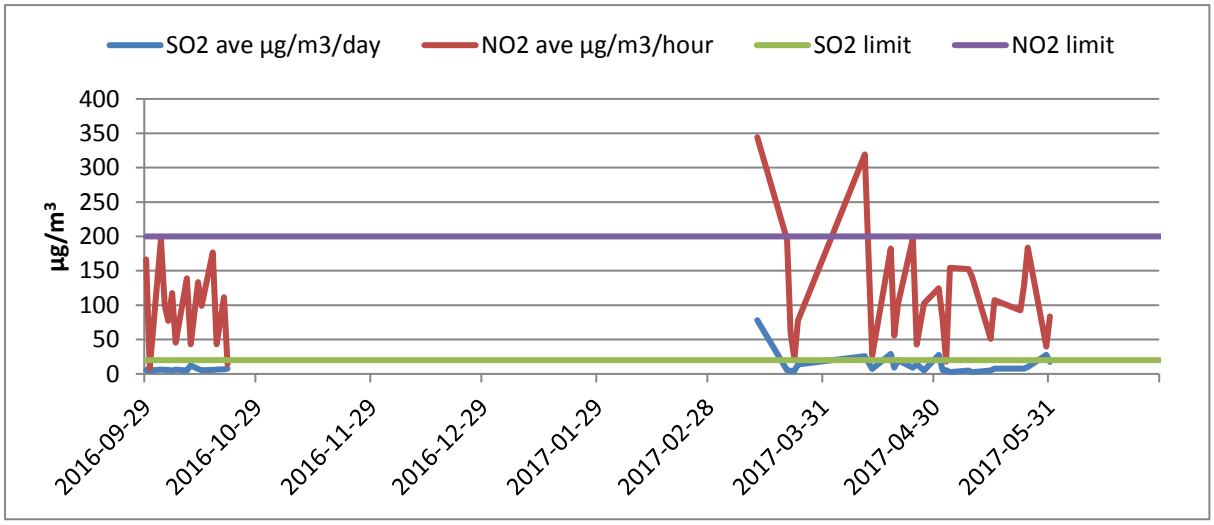


Figure 13: SO_2 and NOx emissions at HPLS

6.2.2 Water quality

As most intrusive construction work has ceased, surface water quality monitoring is no longer necessary, however monthly monitoring of Borehole 5 was undertaken up until the borehole was handed over to Connect in April 2017. Monthly monitoring was conducted using a hand held meter to measure pH and three different indicators of salinity: salinity, electrical conductivity and total dissolved solids.

Every six months (September 2016 and February 2017), a set of samples was collected for full analysis at an accredited laboratory in South Africa. The results were analysed in the context of the suitability of the water for various uses. The long-term trends for Borehole 5 are shown below in Figures 14 and 15. It should be noted that the results received from the laboratory for the February 2016 sample appear to be anomalous and should be discounted. The results from September 2016 and February 2017 appear to confirm this, as the latter results fall well within the normal range. Figure 14 shows the trends for the major cations and anions (excluding sodium and chloride). All these parameters are comfortably within the guideline limits for potable use, irrigation and for industrial purposes,[4] and there does appear to be a stabilising trend.

[3] It was noted during an earlier monitoring period that the results could be affected by vehicle movements near the monitoring position and so during one of the periods when the incinerator was not operating, some background readings were taken to determine additional sources of gaseous pollutants.
[4] The guideline limits used for this project include those from: the World Health Organisation 2011, UK DEFRA Drinking Water Inspectorate 2010 and the South African Government Target Water Quality Objectives (TWQO) for Domestic Use (no adverse health effects) 1996, Industrial Use 1996 and Agricultural Use 1993.

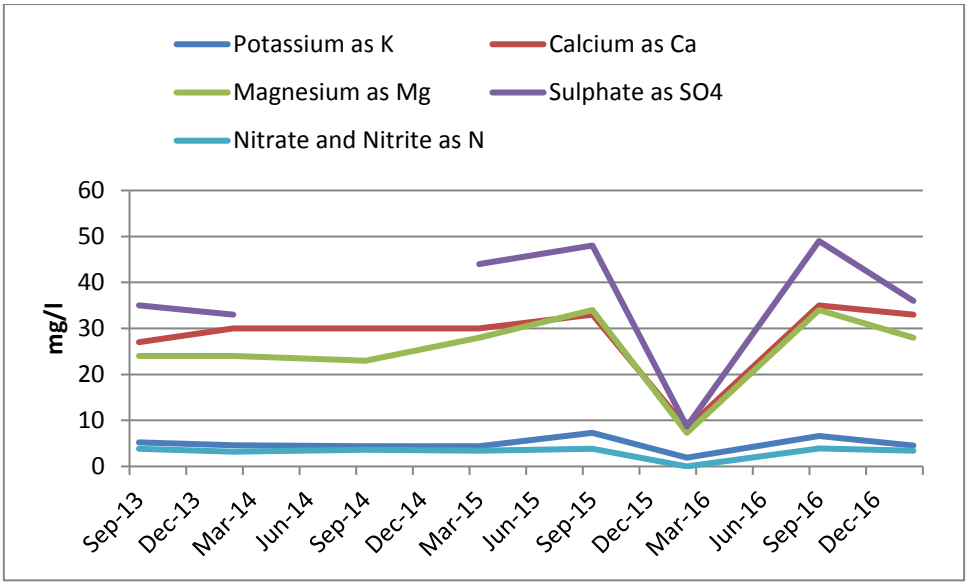


Figure 14: Main cations and anions, Borehole 5

Figure 15 shows the main indicators of salinity in natural waters on the Island: sodium, chloride, total dissolved solids (TDS) and electrical conductivity (eC). Aside from the February 2016 anomaly, the salinity levels in September 2016 are slightly lower than those recorded in the previous year, and still well within the guideline limits for potable water, irrigation and industrial use. The improving trend continued over the next six months to February 2017.

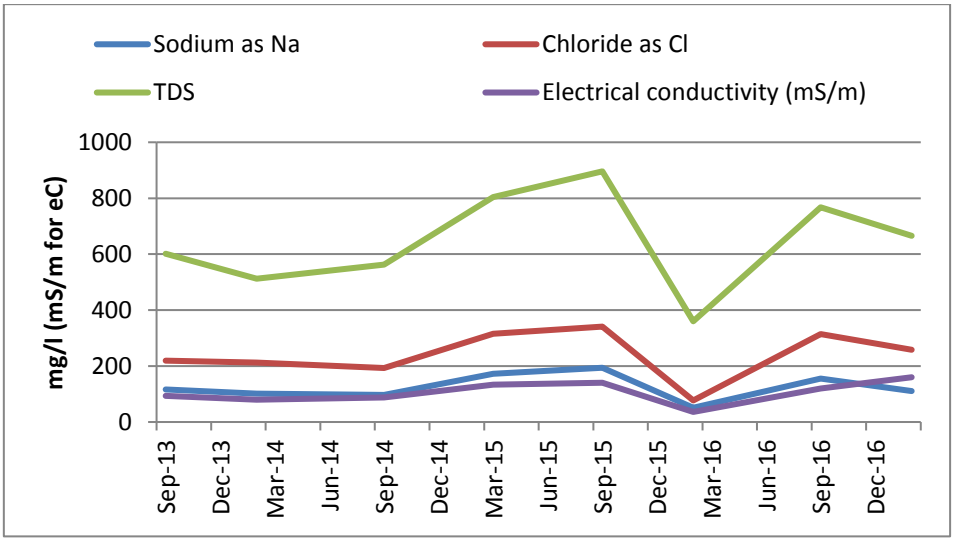


Figure 15: Salinity indicators, Borehole 5

Water samples have been collected from Connect's supply in Rupert's Valley on an ad hoc basis to check whether the water is suitable for hydro-testing of the BFI pipes (as part of commissioning) as well as for use for firefighting at the BFI facilities in Rupert's. Although the water is suitable for drinking from an inorganic perspective, the chloride levels may be too high for some of the specialised testing required. This matter is being investigated further.

6.2.3 Noise

During construction, weekly measurements were taken in the following residential areas: Bradley's, Bottom Woods, Deadwood, Mulberry Gut/Colt Sheds and Rupert's Valley, but since major construction works have been essentially completed in all but Rupert's Valley, noise monitoring ceased at the other locations. While noise monitoring should still be taking place in Rupert's, the instrument was sent to South Africa for calibration and servicing in October 2016 but due to logistical reasons, it had not been returned to the island by the end of June 2017. Regular visits were made by the CECO and SHEQ Manager to the Rupert's residents during this period especially before any activities taking place that were predicted to be exceptionally noisy.

The average noise limit established for this project is 70 decibels (dB(A)). The average monthly decibel readings at various residential areas affected by construction up until the end of October 2016 are shown in Figure 16. Noise levels are affected by many factors including wind, talking, background traffic noise and birds, as well as construction noise. Noise levels at Bradley's have dropped significantly since the workshop was closed down and handed back to SHG in September 2016. However, average daily noise levels at all other monitoring stations still exceed the 70 dB(A) limit, most likely due to the amount of construction traffic still using the airport access road through these settlements.

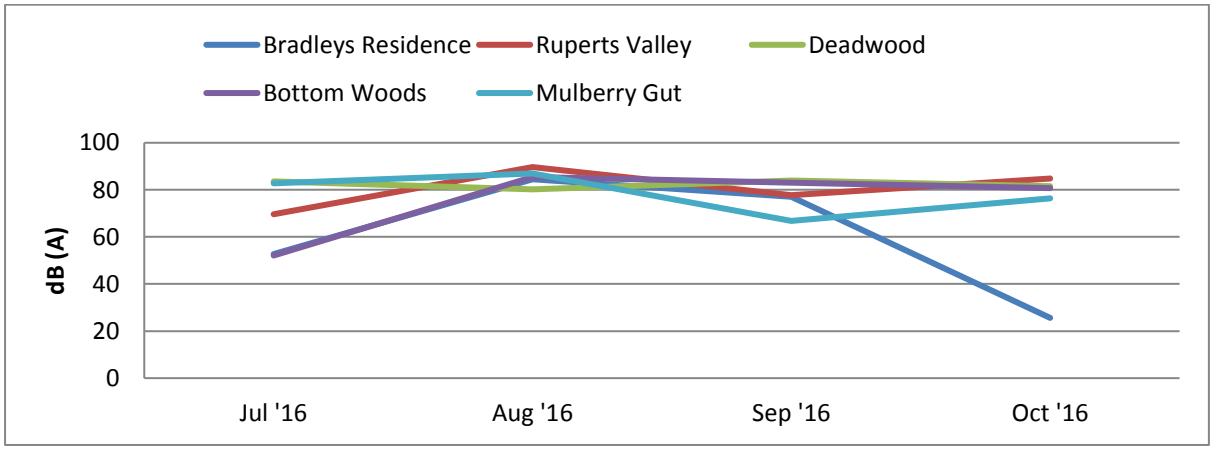


Figure 16: Average monthly noise levels in residential areas

Note: decibel levels increase exponentially and therefore the average is skewed towards the maximum

6.2.4 Vibration and building condition monitoring

No blasting or heavy rolling activities took place during the reporting period. The only construction activity where vibration was a concern was at the breach in Rupert's Lines for the widening of the wharf access road. Rock guards cleared the slope above the construction site prior to the old wall being cut away and strict safety measures were in place for the duration of the work – see section 3.3. No incidents of rockfall due to vibration occurred.

Pre-construction building surveys were undertaken in Deadwood and Rupert's Valley to ascertain the structural integrity of all buildings which could be affected by vibration from construction equipment and blasting. Post-construction building surveys have now taken place in Rupert's Valley. These found some high levels of dust accumulation on the outside of many buildings in the valley. It is recommended

that these buildings should be hosed down on completion of work in Rupert's valley. Some new cracks were observed in one building, and BR have undertaken to fix these for the owner.

6.2.5 Waste management

The amount of hazardous and non-hazardous waste generated is recorded on a weekly basis and waste disposal practices are monitored on a continuous basis by PMU and BR environmental staff during site inspections and audits. Incidents are reported by PMU as Site Observations and BR is required to take immediate action.

The total amount of waste generated in the 2016-2017 year was just over 31,000 tonnes which is 17,000 tonnes less than in the previous year. The majority (89.8%) of this was liquid hazardous waste (sewage and waste oil), 10% was non-hazardous waste and 0.2% comprised solid hazardous waste (Figure 17).

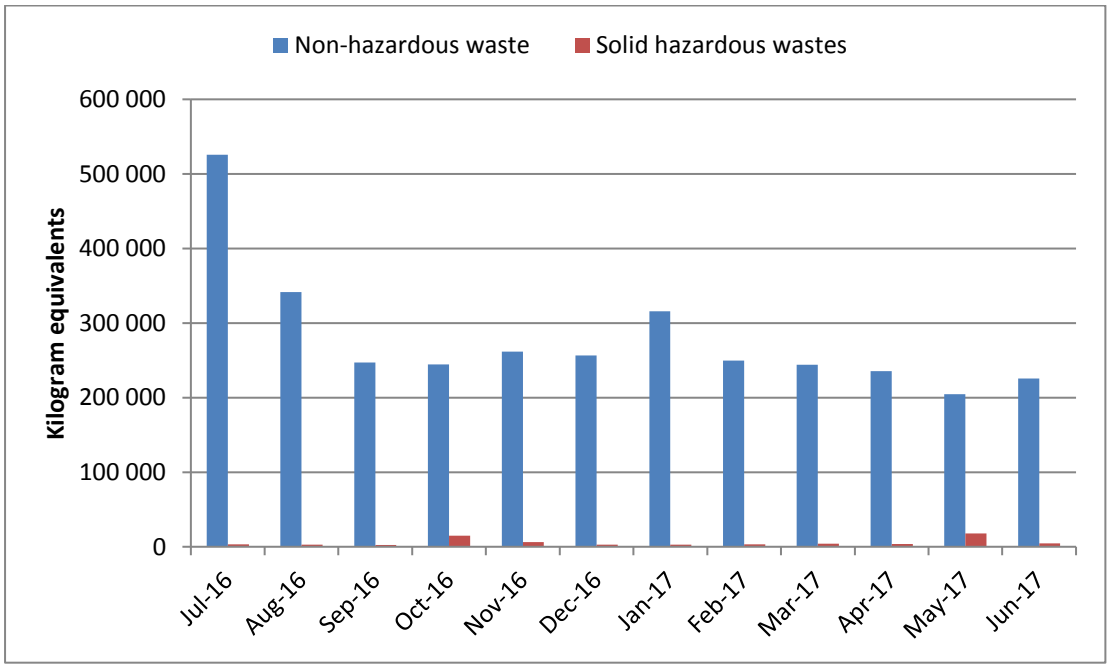


Figure 17: Monthly solid waste quantities

By far the most non-hazardous waste is generated from Bradley's camp (canteen, offices and rooms) at 88%. Metal waste comprised 9%, building rubble 3%, with very small amounts of rubber, paper, pig slops and invasive vegetation making up the rest (Figure 18).

The amount of solid hazardous waste has gone up by a third from last year due to the process of decommissioning sites and cleaning up equipment for export back to South Africa, but volumes are still a fraction of the total waste stream. Most of the hazardous solid waste comprises fat from the grease trap at the Bradley's camp canteen (40%), vehicle batteries (26%), contaminated soil (18%), and empty cement bags (8%) (see Figure 19). The enforced closure of the incinerator for long periods over the past year or two for various operational, technical and environmental reasons, meant that there was a large build-up of empty cement bags. These were being stored in 15 shipping containers which could hold about 500 bags each, equating to 7,500 bags! PMU ruled that these bags could not be disposed of in the bulky waste cell and that they either had to be incinerated on-Island or taken off-Island. The

economics of the latter option were extreme and so these bags were burnt in our incinerator at HPLS at a rate of 70-80 bags per day for six days per week over four months! This mammoth task was accomplished by the two waste operators on our environmental team (Plates 41 and 42).

Plate 41: Empty cement bags waiting to be incinerated

Plate 42: The waste operators, Brian Joshua (left), and William Crowie (right), with Annina Hayes (centre), outside the incinerator

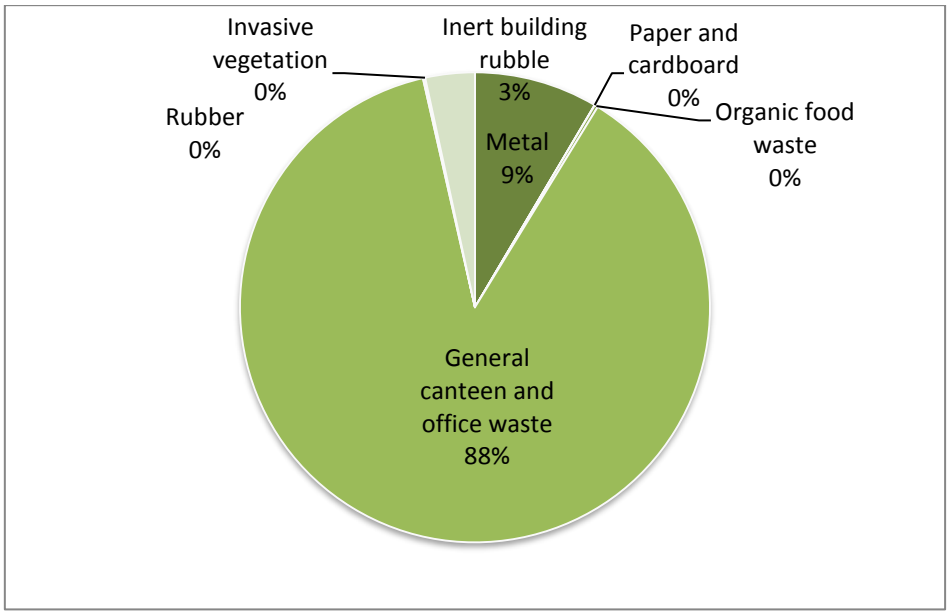


Figure 18: Total non-hazardous waste production, July 2016 to June 2017

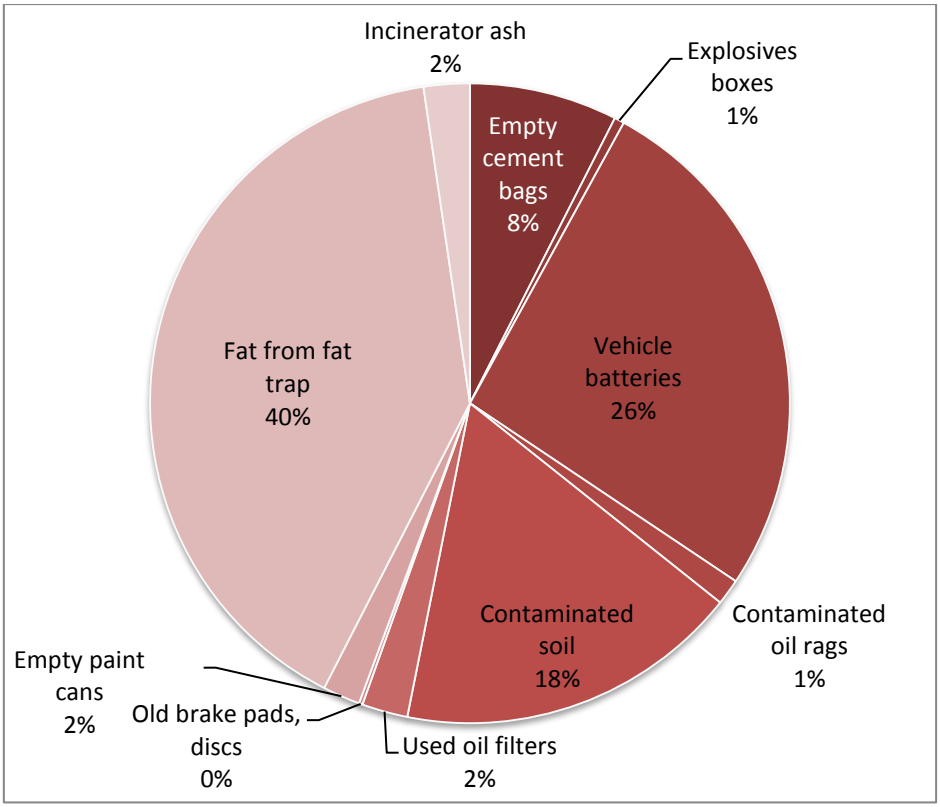


Figure 19: Total solid hazardous waste production, July 2016 to June 2017

Since the two largest waste types (camp waste and sewage) are both taken to the HPLS for disposal, it is unsurprising to note that 99% of the total waste generated is disposed of at that location. Of the rest (1%), most has been recycled on island through sales and donations, followed by recycling off island and disposal at the dedicated BR hazardous waste cell at HPLS (Figure 20). Paper and cardboard used to be delivered to SHAPE for recycling, but this ceased in 2016 when SHAPE had surplus stock. Canteen slops have been delivered to a local pig farmer since the start of the project, but this activity ceased at the end of April 2017 due to changes in the St Helena Food Hygiene Ordinance which resulted in the closure of some piggeries.

The temporary waste storage area next to Bradley's workshop was cleaned up and all waste removed to the bulky waste cell at HPLS in May 2017 (Plates 43 and 44). This facility, with a capacity of almost 5,000 m³, was excavated by BR for EMD, with the agreement that BR could use the cell for disposal of its bulky waste.

Plate 43: Temporary waste storage area next to Bradley's workshop in September 2015

Plate 44: Temporary waste storage area cleaned up and decommissioned in June 2017

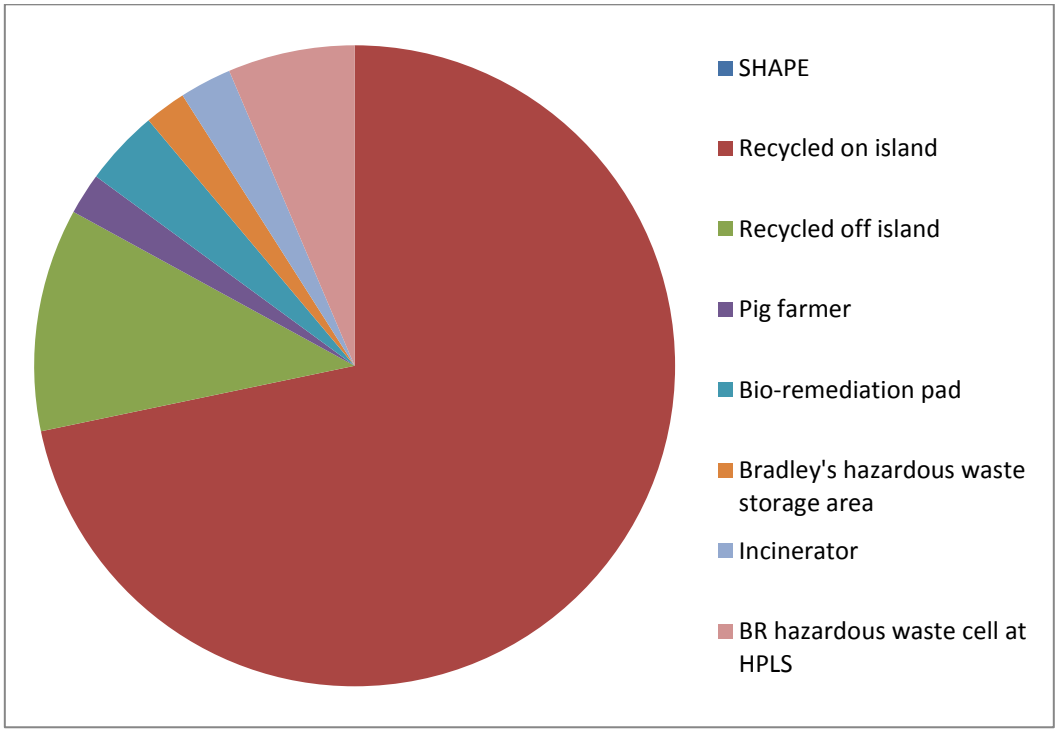


Figure 20: Destination of wastes to all sites except the general domestic and sewage disposal areas at HPLS

6.2.6 Resource Use

Records of usage are kept of the following and reported on a monthly basis:

- Municipal water;
- Groundwater pumped from Borehole 5;
- Electricity; and
- Fuel.

A total of 13,309 kilolitres of water was purchased from Connect, which is about 32% less than that used in the previous year. The reduction is mostly due to water saving initiatives during the drought

from November 2016 to February 2017, as well as the decrease in water demand from the construction sites (Figure 21). Water from Connect is still being used for concrete mixing at the Rupert's concrete batch plant, with a small amount being used for potable water in the offices, stores and workshops.

During the year, just over 25,000 kilolitres of water were abstracted from Borehole 5 in Dry Gut Valley; this amount is only 32% of the amount used in the previous year – this is in spite of increased pumping by Connect during the drought to supply the island (Figure 21). Once the drought broke in February 2017, the amount abstracted from Borehole 5 reduced significantly. Water from Borehole 5 is now only being used by the airport for fire training and by LEMP for irrigation.

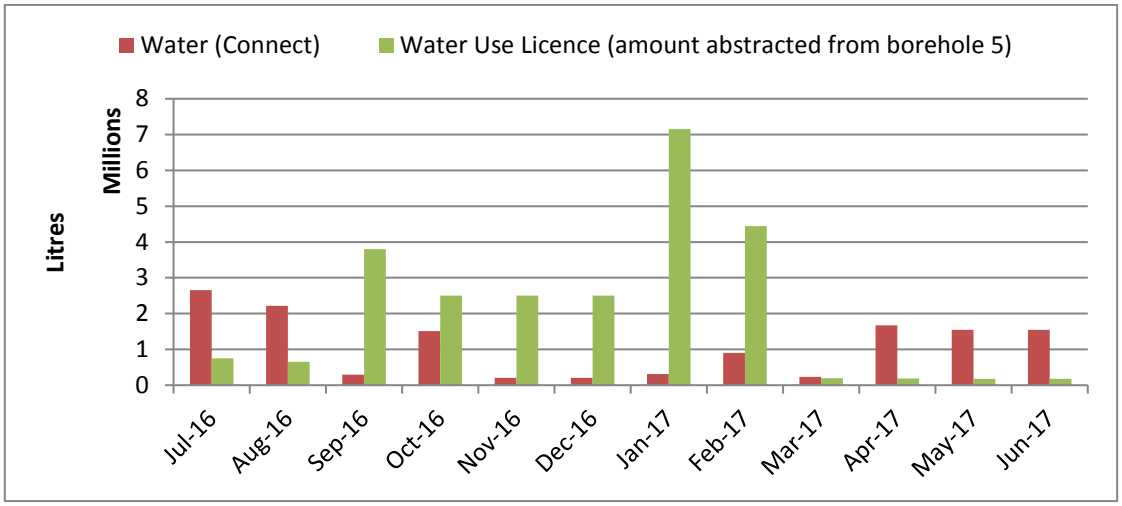


Figure 21: Monthly water consumption

Since the borehole was commissioned and pump tested in early 2013, the water level has hardly varied from the initial static level of 12.9 m, irrespective of pumping rate, and even during high abstraction periods such as the drought, the levels remained within 60 cm of the initial static level. Borehole water levels are reported on in the separate Airport AER.

The amount of electricity used has also decreased as would be expected with the winding down of construction work and staff. A total of 791,653 kilowatt hours (kWh) of electricity was used compared to just over 1 million kWh consumed over the previous 12 month period. The average monthly consumption was approximately 66,000 kWh compared to 83,000 kWh per month in the previous reporting period.

A total of just over 687,000 litres of diesel were consumed during the reporting period which is almost half the consumption of the previous year and some 20% of the amount used in the 2014-15 period. The decrease reflects the reduction in heavy equipment and vehicles on site (Figure 22). Petrol consumption in comparison was a relatively low amount of 10,164 litres compared to 13,401 litres in the previous reporting period (Figure 23).

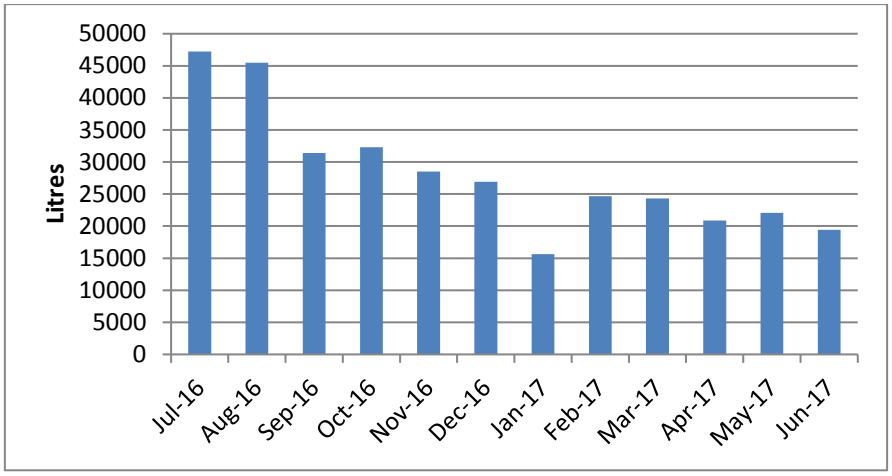


Figure 22: Monthly diesel consumption

The increase in petrol consumption from March 2017 shown in Figure 23 can be attributed to the number of petrol-driven cars being used by the commissioning team and short-term visitors rather than diesel pickup trucks.

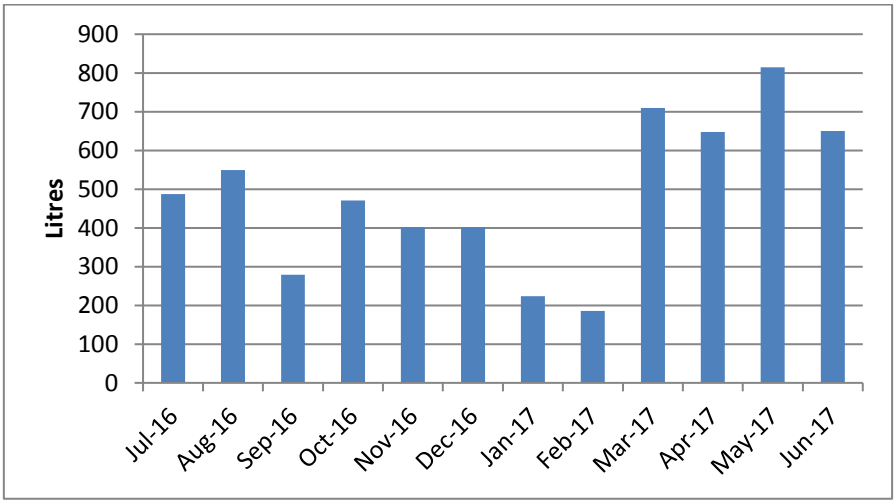


Figure 23: Monthly petrol consumption

6.2.7 Mole spiders

We continued monitoring mole spider activity just below Bradley's camp up until August 2016 to provide a full year's worth of data following removal of the DVOR from the site. It is clear from Figure that the mole spider population in this area continues to flourish and the amount of activity in all four quadrants has continued to increase.

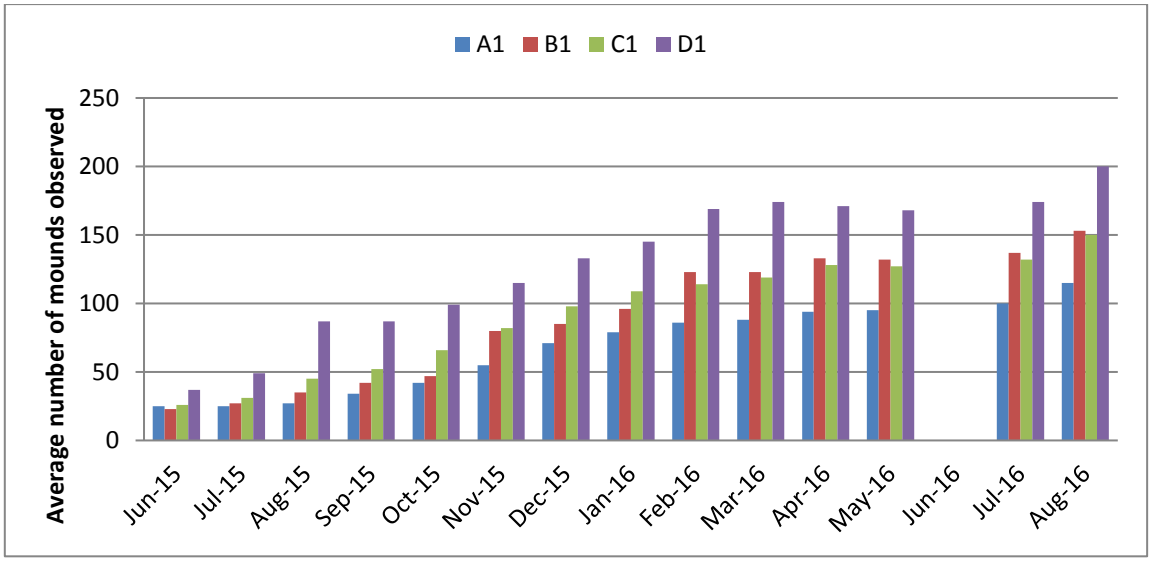


Figure 24: Mole spider monitoring at Bradley's Camp, June 2015 – August 2016[5]

In the last AER 2015-16, we reported on an investigation of invertebrates along the line of the new security fence around the relocated DVOR at the airport. Mole spiders were found to be present in the area but in fairly low numbers. Dr Pryce who conducted the survey, recommended that the fence should be re-aligned to avoid the main mole spider area and that the new fenceline should be monitored for a few months to see if spiders would colonise the area after construction. The data shown in Figure 25 suggest that mole spiders did colonise the area after the fence was constructed and the map plots show how the spiders have spread across the fence line towards the airport (Figures 26 and 27).

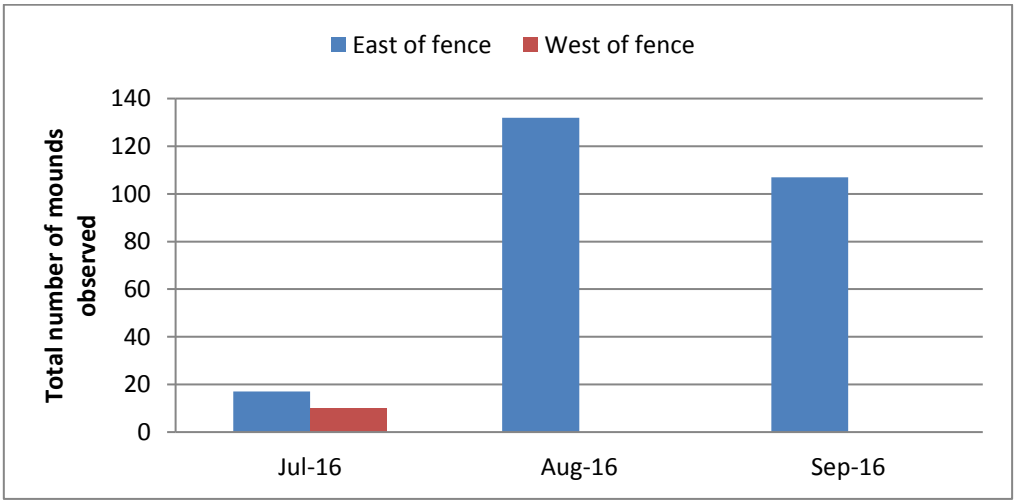


Figure 25: Mole spider mounds observed along the DVOR fenceline

[5] Monitoring blocks A1 to D1 were established in the area immediately east of the original DVOR site at Bradley's camp to reflect what appeared to be four different mole spider colonies (based on the presence of mounds). Block B was the closest to the DVOR site and Block D the most distant.

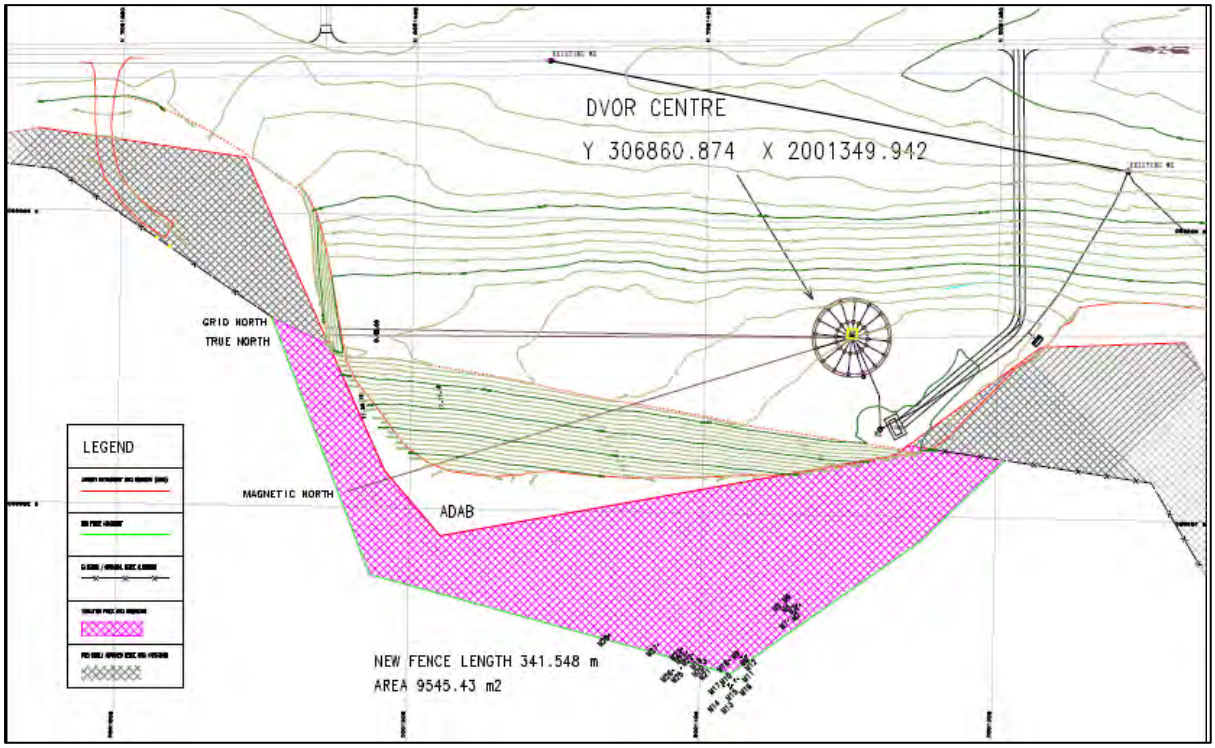


Figure 26: Mole spider mounds on the edge of the monitoring area near the DVOR fence, August 2016 (new fenceline in green)

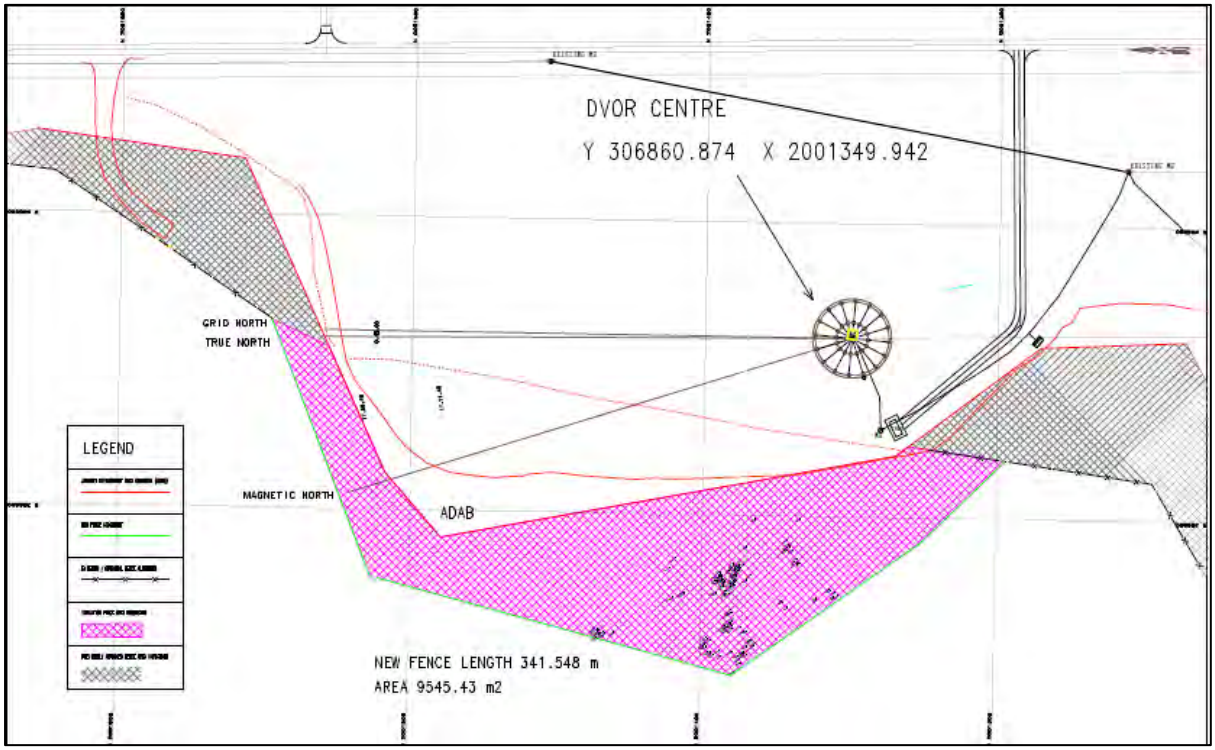


Figure 27: Mole spider mounds in September 2016 indicating significant dispersion (compare to previous map)

6.2.8 Wirebirds

The CECO and staff have been monitoring Wirebirds in all areas affected by construction from the beginning of the project in early 2012. With the completion of most construction work at the airport and along the access road, Wirebird monitoring by project staff ceased in March 2017. The airport operational area is now monitored by the airport staff (reported on in the Airport AER), while the remaining areas continue to be monitored by SHNT.

As in previous years, fewer birds are observed during the peak breeding season in spring to early summer, while sightings increase once the chicks have fledged and the birds forage more widely away from their breeding territories (Figure 28). February and March 2017 saw significant increases in Wirebird numbers in Central Basin, Deadwood, Cook's Bridge, Bilberry Field and Pipe Ridge (Figure).

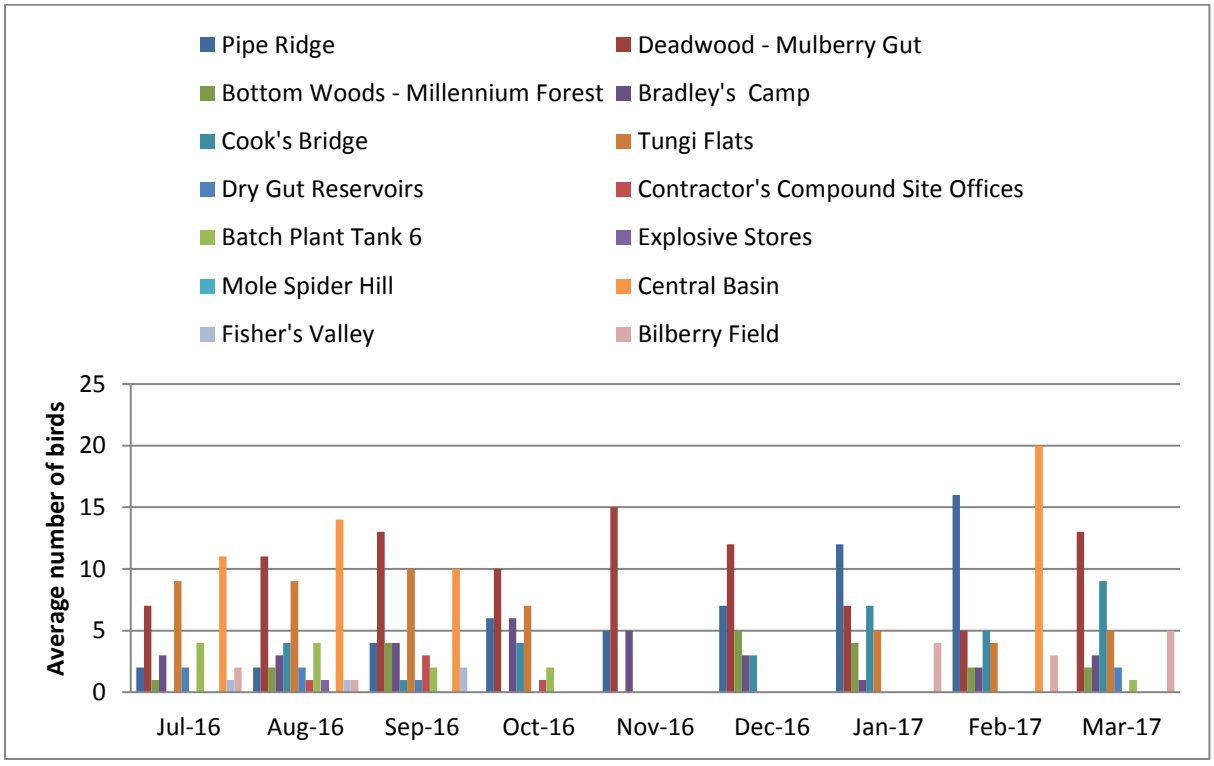


Figure 28: Average number of Wirebirds seen per day of monitoring July 2016 to March 2017

The results of the annual SHNT Wirebird censuses from 2011 (prior to construction commencing) to 2017 are shown in Figure 29. The population on Prosperous Bay Plain (PBP) has shown a remarkable increase since construction began at the beginning of 2012. The Deadwood population seemed to be quite stable at around 70 adult birds until 2016, since when there has been a significant increase in the population in this area – possibly coinciding with the closure of the temporary construction access across the grazing lands. The Bottom Woods Wirebird population saw a decline in numbers up to 2014, but this trend has been reversed and the largest ever number of adult birds was observed in 2017. The improving trends can be attributed in large part to the concerted efforts by the project team and SHNT in controlling the main Wirebird predators: cats, rodents and mynah birds over the past 5-6 years.

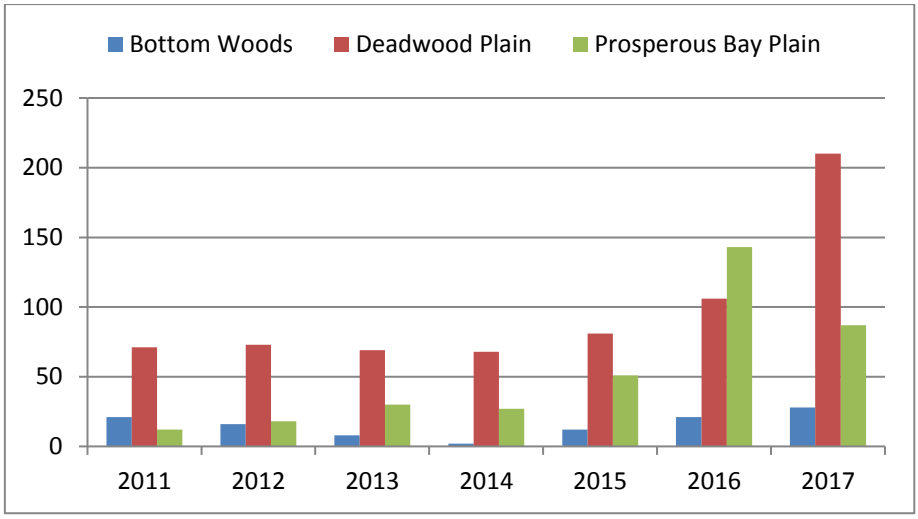


Figure 29: Total number of adult Wirebirds observed during the annual SHNT census

6.2.9 Pests and predators

As mentioned in previous reports, there are a number of pests and predators that need to be controlled on and around the construction sites. Mynah birds, rodents and cats all prey on Wirebirds and their eggs, while rabbits pose a serious threat to plants, especially new plantings.

The airport was handed over in May 2016 and the airport staff have continued the pest and predator control programme within the airport restricted area (see Airport AER for results). Monitoring of pests and predators over the rest of the construction site ceased at the end of August 2016 when most large-scale construction work was finished and the sites decommissioned. Since then, the focus has shifted to cat trapping along Pipe Ridge and in Rupert's Valley, which commenced in September 2016. A total of 15 cats were caught on Pipe Ridge in the 8-month period up to May 2017, and 13 were trapped in Rupert's Valley (Figure 30).

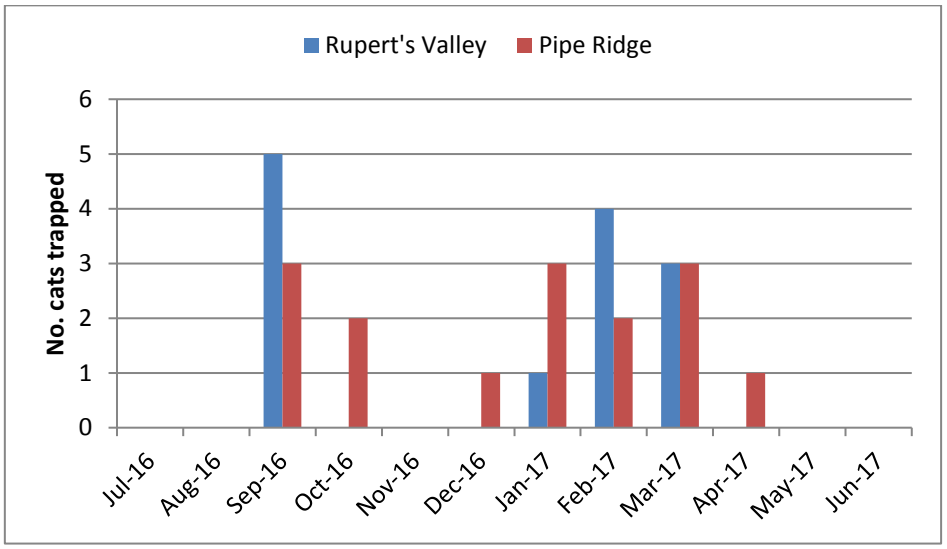


Figure 30: Cats trapped in Rupert's Valley and on Pipe Ridge

6.2.10 Biosecurity

In February 2017, a specimen of the Namibian Ice Plant (*Galenia* spp.) was observed on the airfield near where some works using imported Namibian sand had been carried out (Plate 45). An Island-wide notice was issued and since then several more plants have been found and removed for disposal by incineration. It is likely that in spite of strict biosecurity measures in place at both Walvis Bay harbour (point of loading) and in Rupert's Bay during offloading, some seeds which were present in the imported sand have germinated. The concern is that the introduced plant could out-compete endemic species and can easily be overlooked as it similar in appearance to the local ice plant *Mesembryanthemum crystallinum.* In order to prevent the spread of the Namibian Ice Plant, construction and airport staff have been trained by officers from ANRD and LEMP on how to identify the introduced plant and how to remove it so that its seeds do not spread. Ongoing monitoring is also in place in areas where Namibian sand was used.

Plate 45: Namibian Ice Plant (*Galenia* spp.)

6.2.11 Visual Impact

Photographs are taken from numerous fixed positions across the construction site on a regular basis. The following plates show selected before and after situations on Southern Ridge (Plates 46 and 47) and in Rupert's Valley (Plates 48 and 49).

Plate 46: View of the crushing plant on Southern Ridge during operations (February 2014) (left) and in September 2017 (right) with the Fire Training Rig in the foreground and the re-graded and rehabilitated area in the background

Plate 47: View of the Contractor's yard on Southern Ridge in September 2015 during peak construction (left) and in September 2017 (right) following site clearance and grading. Note LEMP water tank in background.

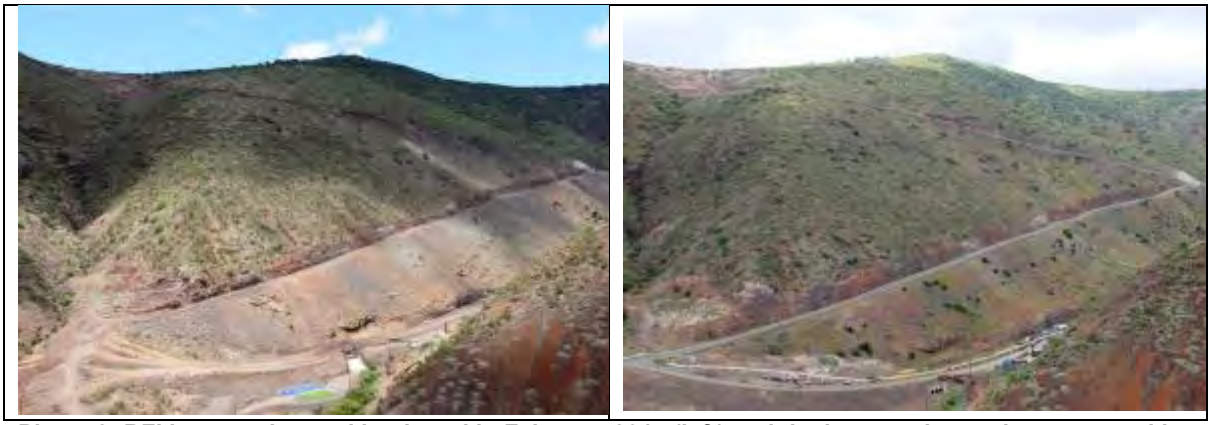


Plate 48: BFI intersection and haul road in February 2014 (left) and the intersection and access road in September 2017 (right)

Plate 49: View of the BFI in February 2014 (left) and in September 2017 (right) from the new access road

6.2.12 Heritage

Archaeological watching briefs are established whenever work is being undertaken in areas of known heritage sensitivity. This involves members of the CECO team being present for the duration of all

excavation works to check for the presence of artefacts or human remains. During the year under review, two watching briefs were put in place: one at the Bayside BFI gantry construction site and the other at the widening of Rupert's Lines (see section 3.3). No artefacts were uncovered at either of the sites.

7 CONCLUSIONS

Targets for 2017-18

- 6-monthly audit in February 2018 and close-out audit in June 2018;
- CEMP update 11 in October 2017;
- Improved compliance with the CEMP and with the key performance indicators listed in the Executive Summary of this AER;
- Safe disposal of all hazardous and bulky wastes by incineration or into the engineered hazardous waste cell;
- Efficient commissioning of the Rupert's BFI and the AFF including strict resource and waste management;
- Handover of incinerator to EMD;
- Handover of access road to SHG;
- Final AER for the construction phase.

REFERENCES

Beard, A. (2017). Marine Ecology Survey 2017, Rupert's Bay, St Helena. Marine Section, Environmental Management Division in conjunction with the Airport Access Office.

APPENDIX A

BASIL READ'S HEALTH, SAFETY, ENVIRONMENT AND QUALITY POLICIES

BASIL READ'S HEALTH, SAFETY, ENVIRONMENTAL AND QUALITY POLICIES

Our business depends as much on the skill of our people as it does on our equipment, and we focus on maintaining a safe and healthy workplace. Our regard for safety, health, the environment and quality work is anchored in our working policy below.

It is the personal responsibility of all Basil Read employees to understand and diligently implement this policy. It is the personal responsibility of our contractors and stakeholders to assist in implementing the policy.

HEALTH AND SAFETY

Our mission is to deliver safe and profitable construction projects and services. We aspire for all our operations to be **zero harm** workplaces. By **zero harm**, we mean:

- *every employee, contractor and visitor returns to their homes unharmed daily*
- *no new cases of occupational illness result from our activities.*

To achieve **zero harm**, we commit to:

- *implementing a comprehensive health and wellness program*
- *implementing systematic processes of hazard identification, risk assessment and risk treatment. We will measure the assurance through operational, corporate, external and internal reporting processes.*
- *setting, measuring, reviewing and reporting on our health and safety objectives and targets, while continuously improving*
- *creating and maintaining a supportive culture with visible leadership, training, coaching and a high level of participation by everyone in the workplace*
- *implementing Basil Read's comprehensive standards, guidelines, systems and procedures to support our **zero harm** aspiration*
- *meeting and, where applicable, exceeding legal and other requirements.*

ENVIRONMENT

Our mission is to minimise harm to the environment by conducting our activities in an environmentally responsible manner.

In delivering on our duty of care towards future generations, it is our priority to encourage our stakeholders to practice good environmental behaviour and operate in a sustainable manner.

This requires that all should conserve and protect environmental resources through, amongst others, efficient use of energy and water, minimising waste and preventing pollution.

Basil Read management is committed to managing its operations in an environmentally responsible manner by:

- *complying with all applicable legal requirements*
- *preventing pollution*
- *recycling waste materials for reuse where possible*
- *setting objectives and targets to monitor our environmental performance and continually improving.*

QUALITY

Our responsibility is to consistently ensure the quality of management, resourcing, teamwork, commitment, documented planning and self-verification through an integrated company management system.

Our objective is to maintain ISO 9001 certification while ensuring the continual development and improvement of our quality management system.

We commit to maintaining quality in all areas in order to meet Basil Read's mission and vision by:

- *endeavoring to meet and exceed client expectations*
- *building sustainable relationships with our suppliers and subcontractors*
- *committing to the continual improvement of the company's overall performance and targets*
- *cultivating an effective working climate and culture to enhance levels of employee engagement, citizenship, behaviour, and performance*
- *empowering employees to deliver high quality products and services on time.*

The CEO's commitment to quality
Neville Nicolau

We will review these policies occasionally to ensure suitability and relevance to Basil Read Limited.