Appendix 6.3 Invertebrate Management Plan

BARRY WATERFRONT CONSORTIUM

THE QUAYS

INVERTEBRATE MANAGEMENT PLAN

13 JULY 2012

soltysbrewster ECOLOGY

4 Stangate House,
Stanwell Road,
Penarth,
Vale of Glamorgan,
United Kingdom.
CF64 2AA

Telephone:- 029 2040 8476
Facsimile:- 029 2040 8482
e-mail:- enquiry@soltysbrewster.co.uk
Web Site:- www.soltysbrewster.co.uk

BARRY WATERFRONT CONSORTIUM

THE QUAYS

INVERTEBRATE MANAGEMENT PLAN

DOCUMENT REF: E0811601 - R08 – 13 JULY 2012

Issue	Revision	Stage	Date	Prepared by	Approved by	Signed
A		Draft Planning	28 February 2012	David Clements Ecology	Dr Matthew Watts (Director)	
B	Revision to title page	Planning	12 April 2012		Dr Matthew Watts (Director)	
C	Minor amendments following comments from Vale of Glamorgan Council Ecologist	Planning	13 July 2012		Dr Matthew Watts (Director)	

CONTENTS

1.0 Rationale

1.1 This strategy applies to the West Pond, South Quay and East Quay areas of the site, as these are all areas where there will be extensive loss of the existing habitats. The Esplanade habitats are of minor significance, due to their small size, and are not dealt with here.

1.2 Given the length of time over which the developments will take place (ie, about 10 years), the diverse range of invertebrates involved, and other factors such as seasonal variations and differing invertebrate habitat requirements etc, the mitigation approach is primarily one of creating and/or re-creating habitats on the developed site which are similar to those which currently exist, and allowing these to be recolonised by invertebrates from the surrounding area, rather than trying to physically move individual invertebrate species from one part of the site to another. This approach could be facilitated by phasing the works in such a way that areas of suitable habitat are always available as temporary refuges for invertebrates dispersing from areas which are being lost, in an attempt to maintain continuity of habitats on the site as a whole.

2.0 Key Issues

2.1 The following issues are identified as being key to the strategy:

- Creation of a 'brownfield meadow' using crushed aggregates sown with native grassland species (West Pond).
- Re-creation of the grassland strip at the foot of the cliff using translocated aggregates and propagules (South Quay).
- Creation of a meadow grassland and wetland 'swale corridor/linear park' (West Pond).
- Loss of an existing large seasonal pond in West Pond, and translocation of pond materials (including substrate) to a new pond which is to be created in the 'brownfield meadow' area.
- Creation of new replacement species-rich grasslands and other open habitats (some primarily for skylark) in East Quay.
- Retention of a strip of existing habitats along the southern foreshore edge of East Quay (again, primarily for skylark).
- Native scrub and thicket plantations at East Quay and elsewhere.
- Creation of brown roofs (mainly at West Pond).
- Interim management of grassland habitats to maintain habitat quality for invertebrates.

3.0 Key Habitats for Invertebrates

3.1 Previous surveys have identified the following habitats within the site as being of key value for invertebrates:

- Grasslands, talus (ie accumulated cliff-foot scree) and aggregate substrates at the foot of the cliff in South Quay.
- Large, shallow seasonal pond in West Pond.
- Extensive species-rich grasslands at East Quay.
- Species-rich grasslands and peripheral scrub habitats elsewhere.

4.0 Key Invertebrate Species

4.1 Scarce and local invertebrates recorded from the site to date include:

Polydrusus formosus	a weevil
Oxystoma cerdo	a weevil
Otiorhynchus rugosostriatus	a weevil
Sitona humeralis	a weevil
Ophonus ardosiacus	a carabid beetle
Nebria salina	a carabid beetle
Hippodamia variegata	a harlequin ladybird
Lampyris noctiluca	glow-worm
Helophilus trivittatus	a hoverfly
Erynnis tages	dingy skipper butterfly
Agriphila latistriata	a grass-moth
Aplocera plagiata	treble-bar moth
Chiasma clathrata	latticed heath moth
Euclidia glyphica	burnet companion moth
Semispilates ochrearia	yellow-belle moth
Tyria jacobaea	cinnabar moth
Coriomerus denticulatus	a squash-bug
Corizus hyoscami	a rhopalid-bug
Livia juncorum	a jumping plant-louse
Leptophyes punctatissima	speckled bush-cricket
Conocephalus discolor	long-winged conehead cricket
Myrmeleotettix maculatus	mottled grasshopper
Orthetrum cancellatum	black-tailed skimmer dragonfly

Cordulegaster boltonii	golden-ringed dragonfly
Armadillidium nasatum	long-nosed pill-woodlouse

4.2 All of these species are either highly mobile and/or are likely to be widespread in similar habitats throughout the Barry Docks area, and could therefore be expected to colonise/recolonise newly created habitats which are suitable within a short period of time (ie within about 2-3 years). None of these species are of sufficient conservation importance to require individual translocation. They are all therefore suitable for a habitat-level mitigation strategy of the type which is proposed herewith.

5.0 Probable Development Phasing

5.1 On current information it appears likely that the site will be developed in the following sequence:

1. West Pond
2. South Quay
3. East Quay

5.2 It is understood that work to commence the development of West Pond is currently scheduled to start in the Summer of 2012, with South Quay development from 2016 and East Quay development from 2020.

6.0 Habitat Level Mitigation

6.1 The following sets out a recommended sequence and methods for habitat-level mitigation measures at the site, based on the probable development phasing set out above.

West Pond

1. Create the 'Brownfield Meadow' (BFM) site using either clean (ie, free of contaminants) substrate materials from within the site (eg possibly from South Quay) or clean imported crushed brick and construction aggregate, mixed 60:40% with free-draining inert subsoil materials. The pH of any imported aggregate should be neutral to slightly basic (ie pH 7-8) and the grain range between about 25mm to dust. Construction details as shown in Soltys Brewster plan 0833103/PL/GA/066.
2. Sow BFM site with appropriate native grassland seed mix (eg Emorsgate EM1 mixture or similar). If required additional seed is to be introduced in year 1 after sowing. If required additional seed material is to be sourced from the species-rich grasslands at East Quay using a brush harvester, and scattered in the BFM site.
3. Create new shallow, irregular pond in BFM area with clay lining (either imported or derived from on-site). Allow to fill with rainwater, or fill artificially and allow to stand for minimum 14 days.
4. Collect samples of aquatic substrate (from top 50mm) and aquatic/wetland plant material from existing large pond, using a mini-digger with a small ditching bucket, and translocate immediately to new pond. Preferential timing of this operation would be in late summer/autumn 2012 so as to transfer eggs/larvae to the new pond
5. Surcharge remainder of West Pond site to required height.
6. Create the 'Swale Corridor/Linear Park' feature using site-derived or imported low-fertility neutral to calcareous subsoils. Construction details as shown in Soltys Brewster plan 0833103/PL/GA/067.
7. Sow Swale Corridor/Linear Park site with native grassland and wetland species (eg Emorsgate EM8, EM2, EL1 or similar). If required additional seed is to be introduced in year 1 after sowing. If required additional seed material is to be sourced from the species-rich grasslands at East Quay using a brush harvester, and scattered in the Swale and Meadow strip.
8. If possible, and seasonally appropriate, collect bulk invertebrate samples from species-rich grassland areas of the site (East Quay or South Quay) using vacuum-sampler (eg D-Vac, converted leaf-blower or similar) and transfer these to the BFM and Swale Corridor/Linear Park sites. Bulk samples to be collected in warm, dry, still weather conditions and to comprise both aerial and ground-level components. Sampling periods not to exceed 5 mins, and samples to be transferred and released at receptor site within 15 mins, to maximise survival. About 20-30 samples to be transferred to each

site. Sampling and transfer of invertebrates could be undertaken in summer 2012 or alternatively in summer 2013, once the BFM and Swale Corridor/Linear Park had been created.

South Quay

9. In interim prior to development, clear dense bramble and unwanted scrub from Cliff-top Corridor and either encourage development of species-rich grassland from existing swards (eg with appropriate mowing regime) or create new species-rich grasslands, for example by horizonal inversion and sowing with commercial native grassland seed mixture.
10. Collect individual large boulders and large stones from base of cliff and store on adjacent bare ground.
11. Excavate talus (cliff-foot scree) and store in low stockpiles (<750mm) at intervals parallel with foot of cliff, at sufficient distance away to allow second winrow to be created between talus material and edge of excavation.
12. Excavate substrate at foot of cliff to a depth of 400mm and store in separate linear winrow parallel with foot of cliff.
13. Surcharge foot of cliff as (1) above and bring to new surface height by replacing 400mm of excavated surface aggregate.
14. Attempt to recreate talus on top of the new, raised surface, using mini-digger or 3CX with small toothed bucket.
15. Replace selected individual large boulders at foot of cliff.
16. If required collect seed material from species-rich grasslands at South Quay using a brush harvester, and scatter along the recreated cliff-foot substrates.
17. Find locations for any surplus boulders elsewhere on the site, eg in the Swale Corridor/Linear Park and/or at the edges of the BFM and pond, or otherwise remove from the site.
18. Surcharge remainder of South Quay site to required height.
19. If possible, and seasonally appropriate, collect bulk invertebrate samples from species-rich grassland areas of the site (East Quay) using vacuum-sampler (as per (8) above) and transfer these to the restored cliff-foot area.
20. Manage existing grassland/scrub mosiac habitats within South Quay to maintain invertebrate interest in the interim period 2012-2016 by means of strimming annually in September/October, and removal of the arisings from the site.

East Quay

21. In interim prior to development, manage existing species-rich grasslands to maintain open, flower-rich swards, eg with appropriate mowing regime.
22. Surcharge to required height with imported materials and re-create species-rich grassland areas in accordance with Soltys Brewster plan 0833103/PL/GA/017.
23. If possible, and seasonally appropriate, collect bulk invertebrate samples from remaining species-rich grassland areas of the site and/or from adjacent areas using vacuum-sampler (as per (8) above) and transfer these to the restored grassland areas.

Brown Roofs

24. The brown roof should, if possible, seek to replicate the crushed aggregate nature of the existing site, with neutral to calcareous substrates of between about 15-25mm supporting a low, skeletal cover which is flower-rich.

7.0 Preferred Seasonal Ranges

Preferred seasonal timings for the various habitat-level mitigation measures referred to are set out in Table 1. In practice, the actual timing of the various tasks is likely to be determined by the clearance and construction programme.

Table 1. Preferred Seasonal Ranges for Habitat-level Mitigation Measures

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Create Brownfield Meadow										■	■	■
Create new grasslands										■	■	■
Sow new native grasslands					■	■						
Create pond in brownfield meadow										■	■	■
Collect and translocate pond materials								■	■			
Collect and translocate bulk invertebrate samples					■	■	■	■				
Collect native wildflower seed on site							■	■	■			
Excavate cliff-foot habitats	■	■	■							■	■	■
Mow existing grasslands to maintain quality									■	■		