H1 Environmental Risk Assessment

Material Recycling Facility, Esperanto Way, Newport

Wastesavers Limited

Successful Partners
DELIVERING QUALITY

Date: August 2015

Our Ref: JER6447

RPS

2420 The Quadrant
Aztec West, Almondsbury
Bristol
BS32 4AQ

Tel: (0)1454 853000
Fax: (0)1454 205820
Email: rpssw@rpsgroup.com

Quality Management

Prepared by:	Amy Powell	
Authorised by:	Katie Edwards-Williams]	
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Amendment Record

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1 Introduction

1.1 Summary of Risk Assessments

1.1.1 As part of an application for an environmental permit Operators must assess the risk to the environment and human health from the activities they seek to permit. The Environment Agency H1 Environmental Risk Assessment Guidance comprises a series of guidance notes covering a range of environmental risks.

- Annex (a) Amenity and Accidents;
- Annex (d) Surface Water Discharges;
- Annex (f) Air Emissions
- Annex (g) Site Waste
- Annex (h) Global Warming Potential

1.2 Proposed Activities on Site

1.2.1 Wastesavers Limited (Wastesavers) is applying for a Waste Operation Environmental Permit. The proposed Materials Recycling Facility (MRF) at Esperanto Way currently operates under a number of exemptions.

1.2.2 Recyclables are collected on a weekly basis, including food waste and cardboard, and then delivered to the existing depot. From 1st April 2016 cans and plastics will be mixed. Waste is then sorted, bulked and baled and finally stored prior to off-site transfer.

1.2.3 The current MRF operated on site will be expanded to increase storage space. This facility will continue to receive local authority public waste and commercial waste but will increase the throughput to meet legislative requirements for recycling. The list of permitted waste types will also be expanded. The proposed layout of the new site is shown in *Drawing JER6447-PER-004_D_150803*.

1.2.4 The existing Waste Reception and Treatment building (currently housing a waste reception area, mechanical and manual sorting area and baling area) and site offices will remain in their current locations in the centre of the site. Material storage areas will move to the newly extended area of the site (as per Drawing *JER6447-PER-004_D_150803).*

1.2.5 A new extension to the Waste Reception and Treatment building will be added to the north of the current building on what is currently, undeveloped land and will be used for storage. An extension to the existing building will be used for cardboard, plastic and can storage. Extra parking will also be added to the site. A new barn will also be built to house food storage, paper and glass bulking.

1.2.6 The existing weighbridge will continue to serve the site. The existing weighbridge is located next to the current offices for weighing inbound waste. A new one way circulation route around the site with a new egress onto Esperanto Way will be installed.

1.2.7 The waste will then be treated / stored according to type and in accordance with the permitted activities on site.

1.3 Location of Site

1.3.1 The application site comprises Wastesavers existing MRF at Esperanto Way, Newport, NP19 0RD and land adjacent (north eastern boundary) to this facility located approximately 1.8km from Newport city centre on the Orb Industrial Estate.

1.3.2 For identification purposes the application site is approximately centred at Ordnance Survey grid reference ST 32026 86241 (postcode NP19 0RD). The site location plan is presented in *Drawing JER6447-PER-001_D_150526*. The newly proposed facility boundary is presented in *Drawing JER6447-PER-004_D_150803*.

1.3.3 The application site is approximately 0.87ha in area and comprises the existing Wastesavers Recycling Depot together plus an additional area of currently vacant land to the north east that is 0.28ha in size. The two sections comprise of; the existing MRF comprising of a main yard and existing building the front of which houses reception area, offices, meeting room, canteen and toilet/cleaning facilities for staff, and the back of which contains the waste processing hall. The other section of the application site is a portion of adjacent land which will be developed to extend both the boundary of the current site and the existing building to facilitate additional waste storage and loading space. Access to the site is via the existing access to Wastesavers MRF from Esperanto Way.

1.3.4 The wider area is an industrial landscape comprising Felnex, Stephenson Street and Reevesland Industrial Estates. The River Usk is approximately 120m east of the site boundary. The east-west running Southern Distributor Road is located approximately 1200m north of the site boundary.

1.3.5 The nearest residential areas and other sensitive receptors to the proposed application site have been identified as follows:

- River Usk (120m west);
- Coronation Park (100m south);
- Royal Gwent Hospital (1500m north west);
- Alexandra Road (600m north west); and
- Lysaght Way (1km north east).

1.3.6 There are two internationally designated nature conservation sites within 10km of the site, the River Usk Special Area for Conservation (SAC) (120m to the south) and the Severn Estuary

SAC with Marine Components, Special Protection Area SPA with marine components and RAMSAR site (3km to the south).

1.3.7 There is one nationally designated nature conservation site within 2km of the site: the River Usk (SSSI) (120m west). There are three more within 3km: the Newport Wetlands (SSSI) (3km south east); the Gwent Levels (SSSI) (3km south east);and the Severn Estuary (National Nature Reserve) (3km south).

1.3.8 There are no non-statutory designated nature conservation sites within 2km of the application site. There is an RSPB Reserve 3.5km to the south of the site.

1.3.9 The nearest named watercourse is the River Usk which is located approximately 120 m west of the site.

1.3.10 No artificial watercourses / features (e.g. canals, reservoirs) have been identified within 1km of the site except Alexandra Docks which is approximately 800m west of the site on the other side of the River Usk.

1.4 Waste Types

1.4.1 The waste types currently accepted on site are listed in the Environmental Permit Application documentation.

1.4.2 Wastesavers is proposing to expand the list of permitted wastes and this proposed list is in the Environmental Permit application documentation.

1.4.3 No waste streams will be mixed (including non-hazardous and hazardous wastes); apart from cans and plastics at the MRF and all waste will be segregated at source.

1.4.4 Materials will be treated and stored before being transported off-site for recycling/recovery/disposal.

2 Amenity and Accidents Environmental Risk Assessment

2.1.1 This section provides the relevant risk assessments of amenity and accident risks associated with the MRF facility.

2.1.2 The scope of the assessment has covered the following:

- Odour;
- Noise and vibration;
- Fugitive emissions; and
- Accidents.

2.1.3 Results of the assessment are provided in the following tables:

- *Table 2-1 Odour risk assessment and management plan*;
- *Table 2-2 Assessment of fugitive emissions risks;*
- *Table 2-3 Assessment of noise and vibration risks*; and
- *Table 2-4 Assessment of accidental risks*.

Table 2-1 Odour risk assessment and management plan

Hazard	Receptors	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk
Odour from vehicles delivering waste to the site.	Site staff, visitors to site, local residents at Coronation Park (100m) and Alexandra Road (600m), River Usk (SSSI, SAC)	Air	Vehicles are inspected on arrival. Wastes are only kept on site for limited periods with odorous wastes removed as a priority. Vehicles are sheeted / sealed. Appropriate site signs. Ensure that customers abide by site procedures as laid out in site rules and procedures.	Low	Nuisance	Low
Odour from Reception Area	Site staff, visitors to site, local residents at Coronation Park (100m) and Alexandra Road (600m), River Usk (SSSI, SAC)	Air	Food waste is stored in a sealed bulker with a cover, in an enclosed building with a roller shutter door. It is removed off site every 24 hours. Food waste storage area roller shutter doors are kept closed except for access/egress. All other wastes are stored in line with JER6447-PER-004_D_150803.	Low	Nuisance	Very low
Odour from site cleanliness	Site staff, visitors to site, local residents at Coronation Park (100m) and Alexandra Road (600m)	Air	Site staff to ensure regular sweeping of site throughout the day and immediate clean-up of any deposition of waste on pad / outside yard area. Site manager to ensure high standards of housekeeping.	Low / medium	Nuisance	Low
Odour from leachate on site	Site staff, visitors to site, local residents at Coronation Park (100m) and Alexandra Road (600m), River Usk (SSSI, SAC)	Air	Any puddles or standing water to be cleaned away. Drainage is to a sealed pipe system. Site manager to ensure high standards of housekeeping. Sealed drainage system.	Low	Nuisance	Very low
Odour from contaminants removed by screening process	Site staff, visitors to site, local residents at Coronation Park (100m) and Alexandra Road (600m), River Usk (SSSI, SAC)	Air	Container is removed from site daily.	Low	Nuisance	Low

Table 2-2 Fugitive Emissions risk assessment and management plan

Hazard	Receptors	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk
Releases to Air						
Dust from vehicles delivering waste to the site.	Site staff, visitors to site, local residents at Coronation Park (100m) and Alexandra Road (600m), River Usk (SSSI, SAC)	Air	Vehicles are sheeted. Appropriate site signs. Ensure that customers abide by site procedures as laid out in site rules and procedures. Regular cleaning using on site vehicle wash and housekeeping of external areas.	Low	Nuisance	Very low
Dust from Waste Reception Area	Site staff	Air	Enclosed building with roller shutter doors to be kept closed except for access/egress. Correct PPE to be worn by staff. Regular housekeeping to ensure dust levels kept to a minimum.	Low	Nuisance	Very low
Pests - Flies	Site staff, visitors to site and River Usk (SSSI, SAC)	Air	Food waste is stored in in sealed containers All waste received (apart from glass, textiles & plastic over spill) and stored pre-treatment within enclosed building with roller shutter doors. Vehicles are sheeted. Waste stored in sealed containers.	Low/medium	Nuisance	Low
Litter	Local residents at Coronation Park (100m) and Alexandra Road (600m), River Usk (SSSI, SAC)	Air	Site enclosed by fencing. Regular housekeeping maintained throughout site. Vehicles are sheeted.	Low/Medium	Low/Nuisance	Low
Releases to Land						

Hazard	Receptors	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk
Pests – Rats, Seagulls, foxes & flies	Site staff, visitors to site, River Usk (SSSI, SAC)	Land	Food waste is stored in a sealed bulker with a cover, in an enclosed building with a roller shutter door. It is removed off site every 24 hours. Vehicles are sheeted. Waste stored in sealed containers.	Low/medium	Nuisance	Low
Releases to Water						
Abnormal / Emergency – Release of contaminant to River Usk	River Usk (SSSI, SAC)	Discharge to watercourse	Spill Procedure, as part of the on-site Environmental Management system contains information on emergency / abnormal procedures in the event of a contaminated release to nearby watercourse. Spill kits are located on site, to create bunds, and/or absorb spilled material. Action taken will be dependent of the volume of spilled material. Weekly visual inspections undertaken of the full drainage system and noted in the site diary. Cut off valve fitted to restrict discharges in the event of emergency / abnormal emissions / vehicle spillage / fuel spillage away from bunded areas, identified at the facility. Tanker points available within the drainage system to allow the drainage to be removed from site if required. Fuel / oil storage bays are bunded to reduce the potential for spillage / discharge.	Low/Medium	Contamination of River Usk SSSI, SAC	Low

Table 2-3 Noise risk assessment and management plan

Hazard	Receptors	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk
Noise emissions from fixed plant at the MRF	Site staff, visitors to site, local residents at Coronation Park (100m) and Alexandra Road (600m), River Usk (SSSI, SAC)	Noise propagation through the air	The Operator's Environmental Management System (EMS) will include a procedure for handling noise complaints and an action plan to be implemented where noise monitoring indicates that noise is being generated in excess of agreed levels. This will include a requirement for all investigations into the source of the noise and any remedial action taken to be recorded and provided to the relevant authorities. For the existing recycling site, to date, there have not been any noise complaints.	Low	Nuisance/Medium (disruption to wildlife)	Low/Medium if properly managed.
Noise associated with deliveries and collections from heavy goods vehicles at the MRF	Site staff, visitors to site, local residents at Coronation Park (100m) and Alexandra Road (600m), River Usk (SSSI, SAC)	Noise propagation through the air and vibration through the ground.	Deliveries to the site and collections/transports from it will only occur between the hours of 07:00 and 17:30.	Low	Nuisance/Medium (disruption to wildlife)	Low/Medium if properly managed.

Table 2-4 Accident risk assessment and management plan

Hazard	Probability of exposure	Consequence	Magnitude of consequence	Risk Management	What is the overall risk
Fire	Low	Potential for paper and cardboard waste to burn.	High	The paper and card waste is stored separately and away from activities that may cause a fire risk or any flammable liquids such as fuels. The site has fire risk assessment, reviewed as and when required. Each member of staff has a basic understanding of fire safety through induction training.	Medium, with prescribed mitigation measures
Failure of mains services (water, electricity)	Med	MRF systems and facilities would cease to operate.	Medium	Plant would close until such time as services were running again. Sealed drainage system and enclosed buildings would ensure containment of waste/waste water.	Low
Flood	Medium	Damage to site, flood waters collecting waste and contaminants from site	High	The site is recorded as being within a flood zone. Registered with Flood Warning Direct. The site will follow the Newport City Emergency Plan in an event. Business continuity plan and procedure. Appropriate signage showing emergency contact numbers.	Medium, with mitigation measures
Spill or leak	Med	Risk of spill running to drain or off site	Med	The site has bunding and drains can be shut off in event of a spill. Staff are trained in spill response procedure. All potential polluting substances on site are correctly bunded and bunding is checked	Low

Hazard	Probability of exposure	Consequence	Magnitude of consequence	Risk Management	What is the overall risk
				weekly.	
Vandalism	Low	Damage to Property resulting in pollution Possible arson attack	Med-High	The site is manned during working hours (07:00-17:30). The site has security fencing and when the site is closed, CCTV is in operation at all times with an audio warning system.	Low
Fire Water	Med	Risk of contamination of the surrounding land and local water course	Med	The drainage from the site collects into a system of sealed pipe work that leads into an attenuation lagoon before discharging into the River Usk. The lagoon serves the wider industrial estate. The site will have a cut off valve fitted to restrict discharges in the event of emergency, identified at the facility Tanker points will be available within the drainage system to allow the drainage to be removed from site if required by a licenced contractor.	Low

3 Surface Water Discharge

3.1.1 Water runoff from the vehicle wash is collected, discharges via a Class 1 Interceptor into the existing surface water sewer. This area is bunded by a concrete kerb.

3.1.2 Surface water from the site, including rain water runoff from roofs of the buildings will be collected through slotted drains (around the perimeter of the site) and surface water manholes located around the site (*Drawing JBR2664 200*). The site operates a Green Water system enabling rainfall collecting from the roof to be reused for flushing the toilets and washing vehicles.

3.1.3 All surface water will run through a sealed pipe drainage system to existing surface water sewer (south and west of site). All site drainage, including run-off from vehicle wash will discharge via a Class 1 Interceptor before discharging directly into the sewer. The existing surface water sewer passes flows from the existing Wastesavers site and wider industrial estate into an attenuation pond, before discharging into the River Usk.

3.1.4 The addition of a Class 1 Interceptor will protect the receiving environment, separating potential oils from the site discharge drainage. In an emergency situation, cut off valves will be switched on restricting off-site discharge. On-site Environmental Management System will ensure discharging surface waters are clean and uncontaminated, not impacting the nearby sensitive receptors.

3.1.5 Process waters derived from the food waste storage area and domestic effluent will discharge via the sealed pipe drainage system into the existing Dwr Cymru foul sewer system. There are no point source discharges to surface water from the facility.

4 Air Emissions

4.1.1 There are not any point source emissions to air at the site.

5 Site Waste

5.1.1 The MRF processes and treats non-hazardous waste inputs and manufactures bales of recyclables and stores bales/recovered waste for onward transport/collection. Any waste remaining from these wastes or waste produced by the site will be removed from site for recovery / disposal.

5.1.2 As part of the waste management procedure on site, each waste stream will be characterized and quantified and suitability of various recovery/disposal options will be assessed and recorded in accordance with the waste hierarchy as set out in the Waste Framework Directive.

5.1.3 The main permit application documentation details the waste streams that are processed through the site.

6 Global Warming Potential

6.1.1 The facility is an existing operational site that is being extended to increase recycling rates in the area. As a result of the extension the facility will require an Environmental Permit for operation. As the facility is currently operational it is not considered appropriate to undertake a global warming potential assessment at this time.

7 Groundwater

7.1.1 The site does not stand on a Groundwater Protection Zone.

7.1.2 The site area is covered in hardstanding that will limit any discharge to groundwater from process areas. There are no discharges to groundwater from the facility.

Drawings

Notes
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Legend

- Permit Boundary
- River Usk Special Area of Conservation (SAC) & Site of Special Scientific Interest (SSSI)

Rev	Description	Date	Initial	Checked

RPS
2420 The Quadrant
Aztec West
Almondsbury
Bristol
BS32 4AQ
T: +44(0)1454 853 000 E: rpssw@rpsgroup.com F: +44(0)1454 205 820

Client WRAP

Project NEWPORT

Title SITE LOCATION PLAN

Status	Drawn By	PM/Checked By
PRELIMINARY	RJ	AP
Job Ref	**Scale @ A3**	**Date Created**
JER6447	1:10,000	MAY 15

Drawing Number **JER6447-PER-001** Rev **-**

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LEGEND

- Installation Boundary
- Covered Storage Bays (Concrete Surface)
- Storage (Concrete Surface)
- Concrete Surface Other
- Proposed Flood Light (Pole Mounted)
- Proposed Flood Light (Wall Mounted)
- Existing Flood Light (Pole Mounted)
- Existing Flood Light (Wall Mounted)

Data Source
RPS Oxford Drawing Ref: 0557-0004-06

Rev	Description	Date	Initial	Checked

RPS

2420 The Quadrant, Aztec West, Almondsbury, Bristol, BS32 4AQ
T: +44(0)1454 853 000 **E:** rpsbl@rpsgroup.com **F:** +44(0)1454 205 820

Client WRAP

Project NEWPORT WASTE DEPOT EXTENSION

Title INSTALLATION BOUNDARY

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Job Ref	**Scale @ A3**	**Date Created**
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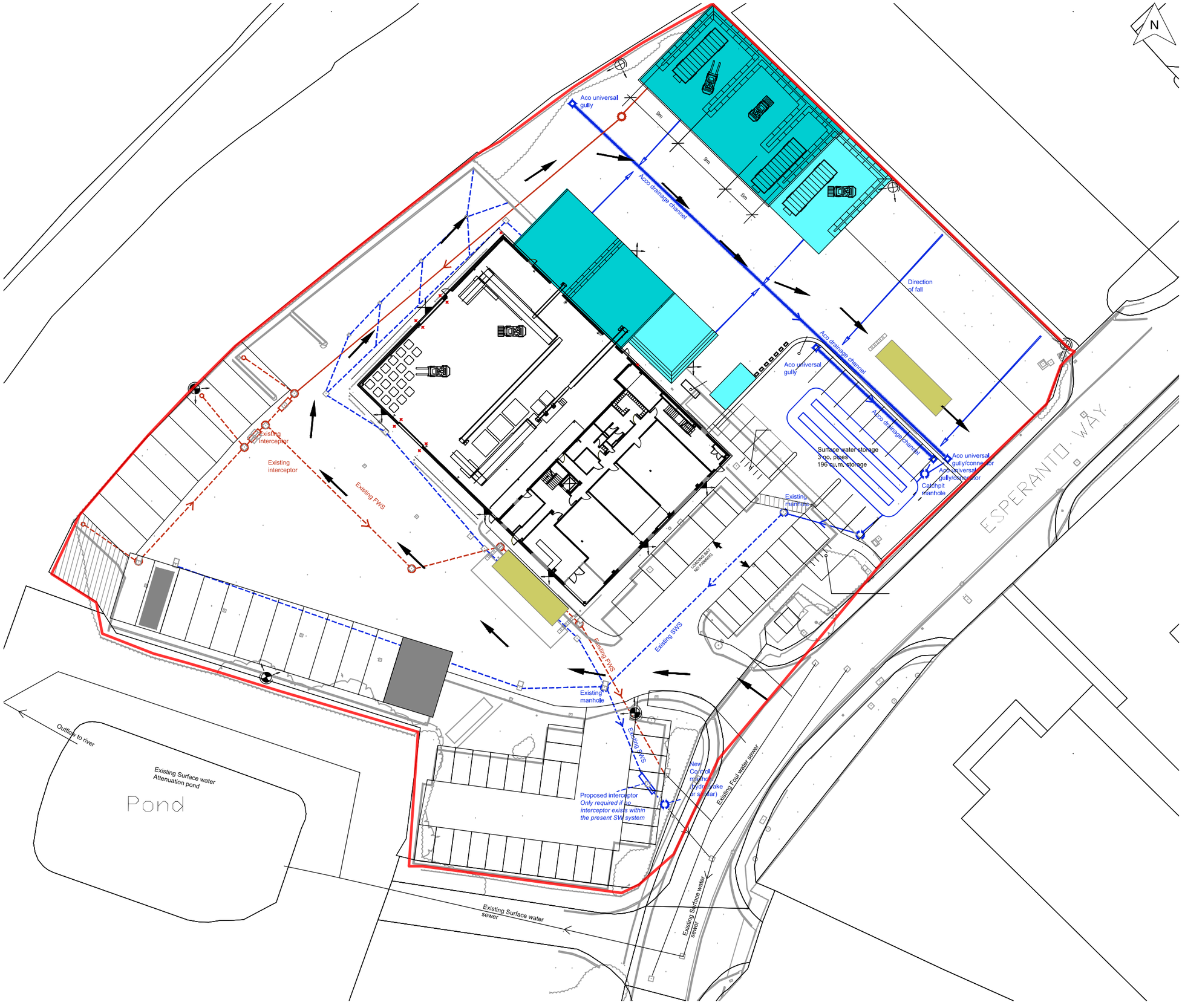

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KEY

Existing Drainage

- Surface Water Sewer (SWS)
- SWS manhole
- Foul Water Sewer (FWS)
- FWS manhole
- Class 1 interceptor

Proposed Drainage

- Surface Water Sewer (SWS)
- SWS Aco drain
- SWS Aco universal gully/connector
- SWS manhole
- Class 1 interceptor
  Only required if there is not an existing interceptor for the surface water as it exists on site

Surface water storage facility provided by Polypipe WMS (or similar approved) arrangement under the car parking area

- Foul Water Sewer (FWS)
- FWS manhole

Rev	Description	Date	Initial	Checked
D	Surface water drainage linking site to existing sewers and attenuation pond shown	7.10.15	CCA	GP
C	Control manhole relocated to Existing SWS outfall pipe	31.09.15	CCA	GP
B	Revised to latest drainage layout.	22.07.15	GP	CCA
A	Drainage layout amended	09.06.15	GP	CCA

RPS

2420 The Quadrant, Aztec West, Almondsbury, Bristol, BS32 4AQ
T: +44(0)1454 853 000 **E:** rpsbl@rpsgroup.com **F:** +44(0)1454 205 820

Client WRAP

Project Esperanto Way
Newport

Title Drainage Strategy

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Drawing Number 200

Rev D

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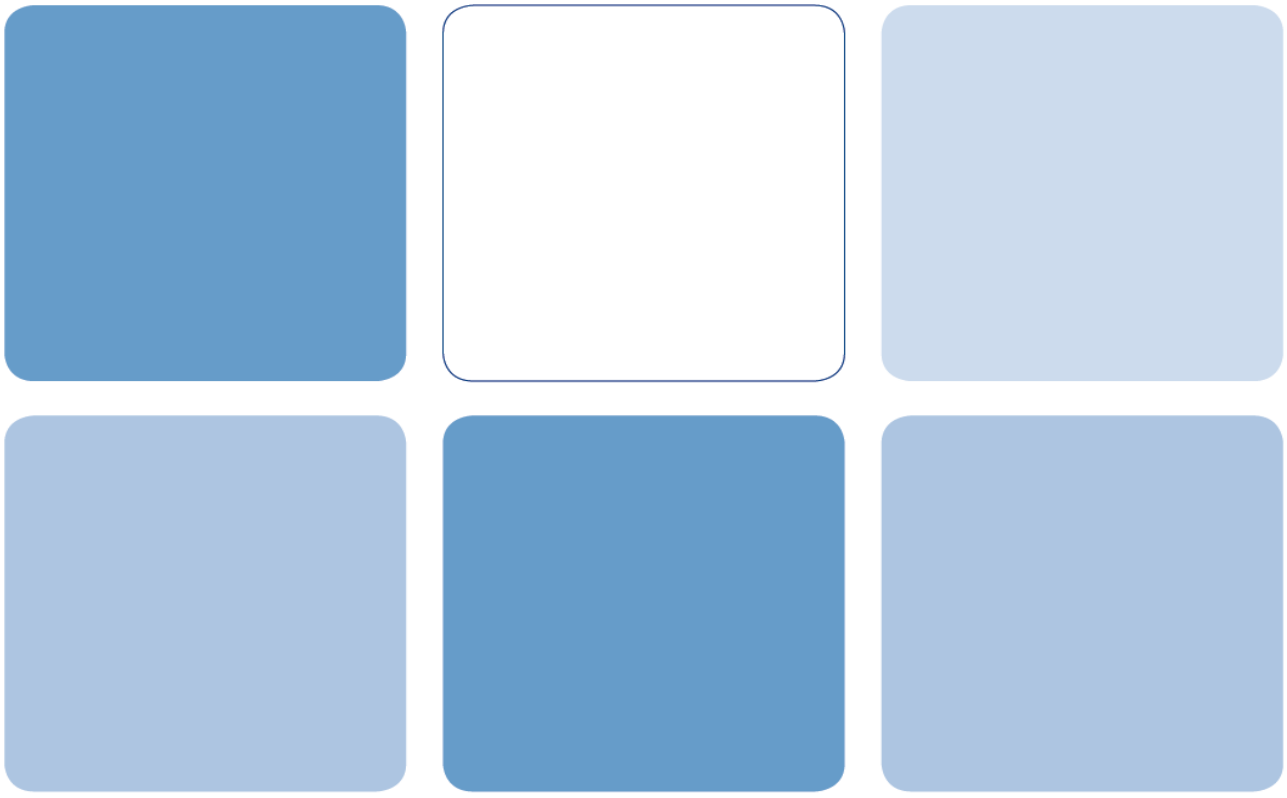
Appendices

Ecological Appraisal Report

WRAP Newport

On Behalf of Wastesavers Ltd.



Date: July 2015

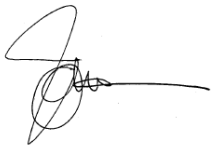
Our Ref: JER6447

RPS

2420 The Quadrant
Aztec West
Almondsbury
Bristol, BS32 4AQ

Tel: (0)1454 853 000
Fax: (0)1454 205 820
Email: rpssw@rpsgroup.com

Quality Management

Prepared by:	Sean Flynn	
Authorised by:	Tim Oliver	
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1	10 July 2015	Inclusion of reptile, botanical and invertebrate surveys	

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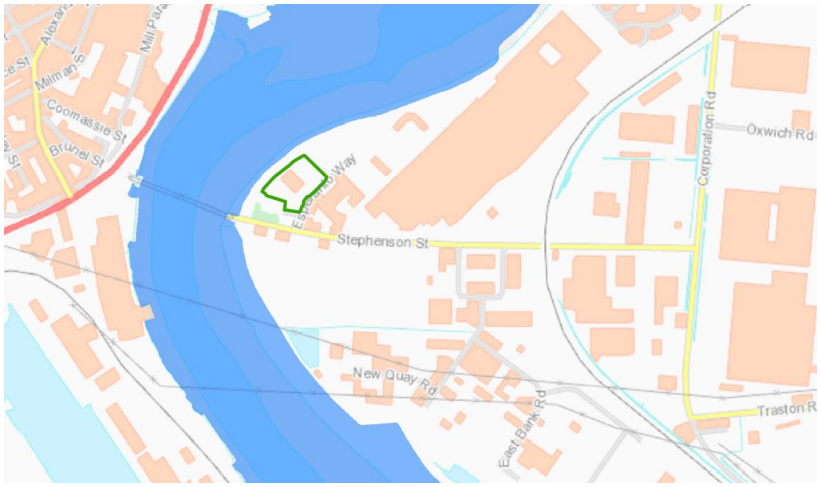
1 Introduction

1.1 Background

1.1.1 RPS Planning and Development Ecology Team were commissioned to undertake an Ecological appraisal of the Wastesavers waste recycling depot on Esperanto Way, Newport (hereafter referred to as 'the Site'). The extent and context of the Site is illustrated on *Figure 1-1*.

1.1.2 The Site covers the existing Wastesavers Depot including the operational building; sections of the un-adopted road; and a 0.2ha area of land to the north-east of the Site. Newport City Council (NCC) and Wastesavers Recycling operate the waste depot on Esperanto Way. Planning permission will be sought for an upgrade of the depot including extension into the 0.2ha area of land to the north east of the Site to increase throughput as a result of improved recycling technology and increased recycling rates.

Figure 1-1: Site Location



1.1.3 Subsequent to the walkover survey, a reptile survey was undertaken between April and June 2015. Following consultation with the Local Planning Authority, specific surveys were commissioned and undertaken to provide additional baseline survey information for the area of naturally regenerating ground and boundary banks making up the north-eastern section of the application site.

1.1.4 A botanical survey of the naturally regenerating habitats was undertaken during site visits in early and late June while an invertebrate survey was completed over three site visits during June. A single morning assessment of the breeding bird assemblage was also undertaken in early June.

1.1.5 This Ecological Appraisal Report includes references to the methods and findings of the specialist surveys.

2 Methods

2.1 Desk Study

2.1.1 Requests were submitted to the South East Wales Ecological Record Centre[1] (SEWBReC) for information on non-statutory designated nature conservation sites within 2km of the survey site and for records of protected or otherwise notable species (e.g. species listed under the local or UK BAP) within 2km of the survey site.

2.1.2 Information on nationally and internationally designated sites within 2km of the site was sought from the Multi-Agency Geographic Information for the Countryside[2] and the Joint Nature Conservation Committee website[3].

2.2 Field Survey

2.2.1 The site walkover survey, undertaken on 20th January 2015, was conducted in accordance with The Handbook for Phase I Habitat Survey (JNCC, 2010) and guidelines on Ecological Appraisal (IEEM 2012).

2.2.2 Habitats within the Site and immediately adjacent were classified, mapped and described in terms of their structure and broad floristic composition.

2.2.3 The habitats within the Site were assessed for their potential to support legally protected or otherwise notable flora and fauna. Where species are not specifically mentioned, this indicates that no habitat of potential value for these species was identified during the survey.

2.2.4 Searches were made for invasive non-native plant species focussing on those species currently listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended in 2010).

2.2.5 Botanical nomenclature in this report follows that of by Stace (1997).

2.3 Botanical Survey

2.3.1 During the first walkover survey in January 2015, full botanical species lists could not be taken as many plant species would not be visible above ground. Consequently a follow up botanical survey was undertaken on 4th and 26th June 2015 by Tim Oliver MCIEEM to record more detailed information on the species composition of the habitats recorded the species composition across the Site.

2.3.2 The areas of natural regeneration were divided into the main stand types based on the landform, percentage cover of vegetation and most abundant species present.

[1] http://www.sewbrec.org.uk/

[2] http://www.magic.gov.uk/

[3] http://www.jncc.gov.uk/

2.3.3 In each stand type, all observed plant species were recorded and an estimate was made of their abundance based on the DAFOR scale (*Table 2-1*).

Table 2-1: DAFOR Scale

Code	Abundance
D	Dominant
A	Abundant
F	Frequent
O	Occasional
R	Rare
L (Prefix)	Local

2.3.4 The scale was originally devised to assess terrestrial vegetation coverage. The abundance of any species is visually assessed on a semi-quantitative scale. The DAFOR classes have no strict definition so personal interpretation is required when applying this scale.

2.3.5 The survey recorded the presence / absence of food plants of rare invertebrate species known to occur in the wider Newport Docks and the findings were cross-referenced with the invertebrate survey.

2.4 Reptile Survey

2.4.1 The reptile survey methodology followed that described in the Herpetofauna Worker's Manual (Gent & Gibson, 2003).

2.4.2 A site walkover was carried out to identify areas of potential reptile habitat that would provide suitable locations for siting artificial refugia, such as transitional areas between dense vegetation and shelter features such as tall ruderal vegetation, scrub and rubble; and more open areas suitable as basking habitat.

2.4.3 A total of 30 artificial refuges (1m x 0.5m pieces of roofing felt) were selectively placed in locations, primarily around the boundary of the site and around the edge of the rubble mound. Individually mats were located in open ground next to dense cover with partially overhanging vegetation. All the better quality reptile habitat was covered.

2.4.4 In order to achieve a good distribution across the extension site, some refugia were located in less suitable areas. A high density of mats was employed to help assess how reptiles may be distributed across the site, if found to be present.

2.4.5 Refugia mats were placed on the site two weeks before the first of seven survey visits. During this 'settlement period' the vegetation beneath the felt becomes flattened and begins to dieback. This period also allows roofing felts located within existing reptile territories to be located and used prior to the survey visits.

2.4.6 During each visit an experienced reptile surveyor undertook a combination of artificial refugia checks and direct observations to search for reptile presence. A transect was slowly walked with the ground ahead of the surveyor being checked for reptile sightings. The mound was crossed and sheltered sunny positions were viewed from a distance to check for basking animals. All the refugia were checked from a distance with the aid of binoculars. Once checked from a distance, each artificial refuge mat was approached slowly to avoid noise and shadow falling on the refuge (as this could disturb reptiles above or beneath the roofing felt mats). The refuge mats were lifted carefully from one corner.

2.4.7 The survey comprised four morning visits (17th April, 7th May, 20th May, 8th June), and three late afternoon visits (28th April, 11th May, 13th May) as described in *Table 2-1*.

Table 2-2: Survey Dates and Conditions

Visit (Date, AM/PM)	Temperature	Weather	Cloud Cover
17/04/2015 AM	12°C	Sunny, still	20%
28/04/15 PM	12°C	Sunny, still	5%
07/05/15 AM	14°C	Sunny, still	20%
11/05/15 PM	15°C	Sunny, light breeze	10%
13/05/15 PM	14°C	Sunny, light breeze	5%
20/05/15 AM	14°C	Overcast, still	90%
08/06/15 AM	17°C	Sunny, light breeze	10%

2.5 Breeding Bird Assemblage

2.5.1 The survey methodology was based on the standard recording techniques detailed in Bibby *et al*. (2000) for undertaking territory based mapping (registration) surveys. Birds were recorded using standard British Trust for Ornithology (BTO) two letter species codes. Specific activity

codes were used for singing, calling, movements between areas, flying, carrying food, nest building, aggressive encounters and other behaviour.

2.5.2 The study area was surveyed between 06:30 and 08:00 on 4th June by Tim Oliver MIEEM. Additional ad hoc observations of bird activity including territory singing were also made during the botanical survey visits.

2.5.3 The bird survey was undertaken in fine weather and all bird activity within and adjoining the site was recorded. The species and activity were recorded on paper field maps of the site and records of species of conservation concern displaying breeding behaviour subsequently digitised using MapInfo 12.5.4 software. The surveyor carrying out the survey was proficient in the use of the BTO Breeding Bird Survey method, having undertaken such surveys on many occasions around the UK.

2.6 Invertebrate Survey

2.6.1 The invertebrate surveys of the extension land were completed in June 2015. The full survey methodology is detailed in the Invertebrate Survey Report (*Appendix 2*). In summary, a combination of pitfall traps, sweeping, vacuum sampling and spot searching were used to assess the invertebrate assemblage using the site and record any species of conservation significance.

2.6.2 Pitfall traps were placed in the ground during the first survey visit and subsequently checked during the second and third visits. Sweeping, vacuum sampling and general searching were carried out on every visit to the site.

2.6.3 Consideration was given to the potential for the site to support species of high conservation value based on the nature of the habitats and range of food plants.

2.6.4 Where practical, invertebrates were identified in the field but wherever confirmation was required specimens were collected and subject to rigorously accurate identification, using the author's own library and entomological collection.

2.6.5 A reasonably wide a taxonomic range was covered during the survey period; covering spiders, harvestmen, woodlice, millipedes, centipedes, most beetle families, many true fly families, froghoppers, leafhoppers and planthoppers, true bugs, ants, wasps, bees, sawflies, butterflies and day-flying moths, dragonflies, damselflies, scorpionflies, lacewings, grasshoppers, bush-crickets, slugs and snails.

3 Results

3.1 Desk study

Statutory Protected Sites

River Usk Special Areas of Conservation

3.1.1 The River Usk SAC lies 20m to the east of the currently active Site. This large estuarine river system is designated primarily for its *Ranunculionfluitantis* and *Callitricho-Batrachion* floating mat vegetation and associated populations of otter *Lutra lutra*, lamprey species, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar* and bullhead *Cottus gobio*.

River Usk (Lower Usk) Sites of Special Scientific Interest

3.1.2 The River Usk is also designated as a SSSI for its fish, invertebrate, moss and liverwort populations. The invertebrate fauna is characteristic of a large lowland river. Of special interest are the craneflies associated with silty river margins in the vicinity of Newbridge-on-Usk. The fish fauna is of international significance including with several rare and scarce species. There is an expanding population of otter also present upstream of Newport. Several scarce higher plant species occur along the river's tidal reaches are also of special interest.

Non-Statutory Protected Sites

3.1.3 Non-statutory protected sites are called Sites of Interest to Nature Conservation (SINC) in Newport. ***Error! Reference source not found.*** provide details of all SINCs within 2km of the Site provided by SEWBReC.

Table 3-1: Designated Sites

Designation	Name	Distance from site (m)	Reason for citation
SINC	Marshall's	80	Mosaic of habitats established on post-industrial land with areas of neutral grassland
SINC	Monkey Island	950	Mosaic of habitats established on post-industrial land.
SINC	Solutia's site	1,430	Site of interest for bird and invertebrate populations
SINC	Afon Ebbw	1,590	Major river system with associated semi-improved neutral grassland and marshy

Designation	Name	Distance from site (m)	Reason for citation
			grassland, swamp, scrub and semi-neutral woodland.
SINC	Alpha's Steel site	1,970	Habitats established on post-industrial land of note for bird interest.

Species

3.1.4 *Table 3-2* provides details of the protected or otherwise notable species (e.g. species listed under the local or UK BAP) within 2km of the proposed development for which there is suitable habitat on or adjacent to the Site. The ecological data is provided by SEWERC.

Table 3-2: Species Records

Species	Latin name	Nearest record (m)	NGR	Notes
European Otter	*Lutra lutra*	930	ST325869	Record located at the A48 Southern Distributor Road bridge over the River Usk. Otter are known to be present throughout the River Usk catchment.
Common Lizard	*Zootoca vivipara*	1290	ST330869	Record is to north of A48 Southern Distributor Road. There is no connectivity between the location of this record and the Site that would allow movement of this species between the two locations.
Great Crested Newt	*Triturus cristatus*	1650	ST333852	Record is for Newport Docks. Record is to north of A48 Southern Distributor Road. There is no connectivity between the location of this record and the Site that would allow movement of this species between the two locations.
Slow-worm	*Anguis fragilis*	1990	ST302871	Record is to the west of the River Usk estuary. There is no connectivity between the location of this record and the Site that would allow movement of this species between the two locations.

3.1.5 Records were also provided for species of bird that may utilise areas of scrub adjacent to the Site boundary for nesting purposes (e.g. house sparrow, dunnock, common bullfinch, reed bunting).

3.1.6 Records for bird species associated with river, marine and estuarine habitats present in the adjacent River Usk estuary were provided by SEWBReC. The small area of previously-industrialised brownfield habitat on Site does not provide suitable habitat for these species and therefore they have not been listed within this document.

3.1.7 SEWBReC provided records for three species of bird listed as having populations of European importance within the Severn Estuary Special Protection Area (SPA) that lies 2.5km to the south of the Site; these were:

- Whimbrel *Numenius phaeopus* 900m from Site;
- Eurasian curlew *Numenius arquata* 1392m from Site; and
- Northern pintail *Anas acuta* 1185m from Site.

3.1.8 The SPA supports at least 1.1% of the northern European population of Eurasian curlew. Populations of whimbrel and northern pintail are listed within an assemblage of wildfowl that are part of a wetland of international importance for supporting at least 20,000 birds.

3.1.9 The site and adjacent parts of the SAC do not support habitats that would have importance for whimbrel, Eurasian curlew, northern pintail or any other wetland or wildfowl species listed within the Severn Estuary SPA citation.

3.2 Site Walkover Survey

Habitats - Operational WRAP Site

3.2.1 The south western part of the application site comprises the existing Wastesavers Ltd. building and the associated surfaced concrete hardstanding within the car park and operational areas.

3.2.2 Small areas of butterfly bush *Buddleja davidii* were noted adjacent to the access gate and fencing between the main Wastesavers operational area and Esperanto Way. Along the south west boundaries of the Site, areas of dense bramble *Rubus fruiticosus agg.* has established along with young silver birch *Betula pendula* and butterfly bush.

3.2.3 The Wastesavers Building is a large modern industrial building constructed of a brick and breeze block structure clad with corrugated metal panels. The roof is a mix of corrugated plastic (as skylights) and corrugated metal panel sheets.

Plate 3-: Wastesavers Building

3.2.4 The application area also includes a small section of un-adopted road (Esperanto Way) adjoining the existing operational site.

Habitats – Extension Site

3.2.5 The proposed extension area to the north-east of the operational site is approximately 75m by 35m in extent comprising formerly disturbed ground that subject to natural colonisation. For the botanical survey the vegetated habitats were subdivided into four main areas (Area A-D) and these are shown on the Habitat Plan.

3.2.6 Part of the site, remains as bare ground but the majority is becoming vegetated with a patchy cover of ephemeral and early colonising species with a vegetation cover of between 20% and 40% (Area A). The north-eastern part of the site has developed into grassland and will not have been subject to as recent disturbance (Area B). The boundaries to the north-east and south-east are banked up and support dense ruderal vegetation with butterfly bush shrubs (Area C and D respectively). An area of large diameter construction rubble lies in the centre of the Site, and extends up the north-eastern boundary bank.

3.2.7 The habitats are described below based on findings of the Phase 1 walkover and the June botanical survey. Full species lists for the naturally developing habitats and boundary banks are given in *Appendix 1*.

Ephemeral Short Perennial Vegetation

3.2.8 Bare ground grades into sparsely vegetated ground with an assemblage of ruderal and pioneer grassland species with a small number of tree saplings. In June, there was a pool of very shallow standing water which had collected on the bare ground south of the rubble pile. Seasonally waterlogging and drying out in this area is likely to have influenced the limited degree to which this area has been recolonised.

3.2.9 Overall the substrate is primarily crushed stone with soil only just starting to build up. Vegetation cover remains sparse with creeping bent *Agrostis stolonifera* the most abundant species, growing in numerous small tussocks and spreading out through stolon runners. Other species occurring across this habitat were Yorkshire fog *Holcus lanatus*, meadow grasses *Poa* spp., perforate St Johns's wort *Hypericum perfoliatum*, scented mayweed *Matricaria chamomilla*, and beaked hawk's-bread *Crepis vesicaria* (Target Note 6).

3.2.10 Localised areas of substrate were sandy and were associated with abundant toadrush *Juncus bufonius,* and tree saplings along with the colonising grasses.

Plate 3-1: Ephemeral short perennial vegetation (June)

Plate 3-2: Naturally Colonising Ground (January)

3.2.11 In total, 60 plant species were recorded overall with many as a few individuals or local populations. The composition is mix of neutral grassland species (i.e. ribwort plantain, creeping cinquefoil, selfheal, and buttercups, etc); dry grassland species (wild carrot, common centaury, little mouse-ear, black medick, hop trefoil etc); and pioneer ruderals (i.e. creeping thistle, teasel, evening primrose, ragwort, dandelion, etc).

3.2.12 Two species associated with coastal habitats were recorded; sea plantain and lesser sea spurrey, but both were only present as isolated individuals.

Regenerating Grassland

3.2.13 Establishing grassland with a higher percentage cover (75%+) occurs in the northern part of the site (Target Note 4). The most frequent plant species in the grassland were also frequent in the sparsely vegetated ground adjoining. Creeping bent, Yorkshire fog and smooth meadow grass were present throughout with red fescue *Festuca rubra*, squirrel-tail fescue *Vulpia bromoides*, cock's-foot *Dactylis glomerata* and false oat-grass *Arrhenatherum elatius* also established in the sward.

3.2.14 Many species of the clover family had established in the grassland with bird's-foot trefoil *Lotus corniculatus,* grass vetchling *Lathyrus nissolia*, black medick *Medicago lupilina* all locally abundant. Plant species diversity was as high as the adjoining regenerating ground with many of the pioneer and ruderal species surviving in the open grassland.

Plate 3-3: Regenerating Grassland

Marshy Grassland

3.2.15 There is an area of marshy grassland on the north-western edge of side of the extension site continuous with the regenerating grassland (Target Note 3). Poor drainage has allowed marshy vegetation to establish on an area of undulating partially bunded ground. In places a dense low-diversity carpet of pleurocarpous moss (including Pointed spear-moss *Calliergonella*

cuspidatum) indicating that it is likely to be regularly waterlogged. Common fleabane *Pulicaria dysentrica*, hard rush *Juncus inflexus* and false fox sedge *Carex otrubae* are all frequent.

3.2.16 At the time of January and early June survey there was standing water in a small depression on the northern boundary, but this feature was completely dry by the late June visit. It is considered that compacted waste ground with poor drainage will have resulted in the establishment of the localised areas of pooling after rain. The presence of curled dock in the pond indicates frequent drying out although individual plants of reedmace *Typha latifolia* and yellow flag *Iris pseudacorus* occur on the edges.

Plate 3-4: Marshy grassland (foreground) with regenerating grassland beyond

Rubble Mound

3.2.17 The 20m by 20m rubble pile reaches up to 1m in height comprising bricks, concrete blocks, wood, plasterboard and soil (Target Note 5).

Plate 3-5: Rubble Mound

3.2.18 The percentage cover of vegetation in summer remained low (less than 10%). A number of the most frequently occurring plant species on the ground were also colonising the rubble pile. The botanical species composition included several species not recorded elsewhere within the Site including the weed species (groundsel and hedge bindweed), non-native plants (purple toadflax and snapdragon) plus individual bittersweet and wood avens on the margins amongst establishing grass and a few of the herbaceous species recorded the main area of natural colonisation (Area A).

Neutral Grassland and Ruderal Vegetation

3.2.19 Rank vegetation alongside the north-east and south-east boundary of the extension site (Target Note 2) was characterised by a tall herbs, grasses including false oat-grass, creeping bent and Yorkshire fog along with low growing bramble. Herbaceous forbs were present in low number and generally at low frequency. The composition included hemp agrimony *Eupatorium cannabium*, wild parsnip *Pastinacea sativa* and common vetch *Vicia sativa*.

Plate 3-6: Neutral grassland and tall herb vegetation on southern boundary

Scrub

3.2.20 The bank forming the north-eastern site boundary comprises a stand of maturing butterfly bush with tall ruderals, coarse grass and bramble (Target Note 1). Grassy areas below and between shrubs were characterised by coarse grasses (false oat-grass, rough meadow-grass) with the frequent associate species: creeping thistle *Cirsium arvense*, and smooth sow-thistle *Sonchus oleraceus.* Overall species diversity was low but a few grassland forb species still occurred at low frequency in pockets of coarse grassland.

Plate 3-7: Butterfly bush scrub and rubble along north eastern boundary

Off-site Habitats

Scrub

3.2.21 Outside the site boundary, there is a stand of dense scrub on the flood defence embankment immediately adjoining the site. The vegetation lies between the site and the River Usk SAC and SSSI to the northwest. The most frequent species were hawthorn *Crataegus monogyna,* goat willow *Salix caprea* and occasional butterfly bush. Traveller's joy *Clematis vitalba* and bramble were noted sprawling throughout the scrub vegetation.

Plate 3-8: Dense scrub (outside site boundary)

Built Structure

3.2.22 A small dilapidated hut constructed with a chipboard shell on a pine frame was the only structure within the proposed extension area. The small internal space is open to the external environment with gaps between the walls and the roof.

Fauna

Breeding Bird Assemblage

3.2.23 Opportunities for nesting birds within the site are limited with expanses of bare or sparsely vegetated ground and relatively little cover. The regenerating butterfly bush shrubs on the western and eastern boundaries are generally open and part of a tall herb plant community. In comparison, the dense woody scrub beyond the northwest boundary provided dense cover and higher value as nesting habitat.

3.2.24 In total, 16 bird species were recorded during the early morning bird survey. No nest sites were recorded and there was no activity indicating the presence of a nest site within the site boundary such as repeated alarm calls or adults carrying food. The survey was undertaken at a time of day when adults should be actively feeding young and the absence of activity strongly indicates the absence of nests.

3.2.25 Territorial behaviour of blackbird, whitethroat, and wren was exhibited in the dense scrub habitat adjoining the site territorial behaviour with all three species were considered to be nesting close to the site boundary. These three species were also heard singing further from the site, to the north-east, associated with boundary habitats of further industrial units.

3.2.26 The other observed activity was associated with foraging birds coming into the site to find food with likely nest sites in the wider area. Magpie, wood pigeon and starling were the most frequently seen species, usually overflying the site but occasionally landing. A lesser black backed gull also briefly landed at the site to drink.

3.2.27 Four species of high conservation concern were recorded (bullfinch, linnet, starling and house sparrow).

3.2.28 A pair of bullfinch foraging around the edges of the rubble mound for around 20 minutes in the early morning. The birds showed no further territorial behaviour and dispersed eastwards from the site. For a short period, a male called repeatedly from the open butterfly bush vegetation on the western boundary. A close inspection of the area confirmed that there were no nests and no potentially suitable cover for a nest in this location.

3.2.29 Two male linnets were recorded on briefly early in the survey to drink from the pool of collected rainwater at the southern end of the site with a single male bird returning for the same reason towards the end of the bird activity survey.

3.2.30 House sparrow was observed foraging at the site on several occasions during the survey with up to three individuals seen together. House sparrow and starling as well as pied wagtail are considered to be nesting in buildings in the wider area. House sparrow was seen frequently during the survey.

3.2.31 Goldfinch were frequently seen and heard around the site and surroundings during the survey with up to 4 birds seen at the same time: a family group of adult and juvenile.

3.2.32 Hedge sparrow was also occasionally observed in different locations on the shrubby site boundaries and dust bathing in the patch of sandy substrate.

3.2.33 A flock of five long-tailed tit were observed foraging in the off-site scrub and briefly in butterfly bush on the edge of the site before moving south along the line of scrub. The other species; greenfinch, pied wagtail, and blue tit were only recorded briefly foraging in the site.

Reptiles

3.2.34 Suitable habitat for reptiles was noted in the extension area during the January survey. The vegetated embankment on the north-eastern boundary of the site (Target Note 1) and adjoining rubble piles (Target Note 5) provide many opportunities for shelter, basking and below ground refuge. Both areas have connectivity to wider areas of suitable reptile habitat.

3.2.35 During the original site visit, one of the site personnel stated that they had previously seen a common lizard immediately adjacent to the Site.

3.2.36 No reptiles were observed during the reptile presence / likely absence surveys either basking around the site or near refugia. All survey visits were conducted during optimal weather conditions at a suitable time of year, with a high density of mats positioned in suitable locations. The small size of the site and limited cover by dense vegetation enabled all suitable habitats to be thoroughly checked.

Invertebrates

3.2.37 The findings of the invertebrate survey are presented in Appendix 2. In summary, the survey identified 242 species of invertebrate, from a broad range of invertebrate groups including slugs/snails, woodlice, centipedes/millipedes, spiders, crickets & groundhoppers, earwigs, true bugs, froghoppers/leafhoppers, moths, butterflies, beetles, true flies, sawflies, ants, wasps and bees.

3.2.38 The overall assemblage comprised many individuals from a few major groups

- Diptera (61 species, 25%)
- Beetles (58 species, 24%),
- Spiders (34 species14%),
- Ants, bees, wasps (27 species, 11%).

3.2.39 10 species identified are considered as Key Species being classified as RDB, Nationally Scarce or listed under Section 42 of the NERC Act. Two of the species found have RDB or equivalent status, but both are probably recent arrivals in the UK, one which is rapidly spreading and very little is known about the second colonising species.

3.2.40 Of the two target species, the Small Ranunculus moth *Hecatera dysodea* will not breed at the site as the food plant, Prickly Lettuce *Lactuca serriola* is not present. This moth is now so well established in the region that it is no longer of conservation concern.

3.2.41 The potential host plant of the wormwood moonshiner beetle *Amara fusca*, in the Newport Docks area is mugwort *Artemesia vulgaris* which occurs as a few plants on and outside the site boundary fence.

Great Crested Newts

3.2.42 The temporary pooled water on-site is considered to be temporary and of negligible value for amphibians. The only waterbody in the surrounding area is a balancing pond located approximately 15m to the south west of the application site boundary (Target Note 6).

Plate 3-9: Off-site balancing pond

3.2.43 This balancing pond is surrounded by willow and white poplar *Populus alba* with a stand of reed canary-grass. The open water was cloudy and discoloured apparently due to pollution. Discussions with Wastesavers personnel indicated the pond receives surface run-off from the adjoining industrial areas. Based on the likely level of pollution, the presence of great crested newts is considered very unlikely although more pollution tolerant amphibian species, such as smooth newt and common toad, may use the pond.

3.2.44 The pond lies 90m from the extension area and is separated from it by the operational site and existing WRAP building. The rubble pile within the extension area provides good quality shelter and refuge for amphibians and could be used as terrestrial habitat by amphibians, if any species are breeding in the locality.

European Otter

3.2.45 The River Usk SAC is a known stronghold for otter and there is low potential that otter may use the scrub adjacent to the north western boundary of the Site for shelter and lying up. During the survey this area was checked and no clear signs such as flattened vegetation were found that would indicate regular movement by a medium sized mammal such as otter. The security fence around the site creates a barrier to the movement of otter but there will be localised gaps in the base of the fence through which an otter could pass.

3.2.46 There is no habitat suitable for shelter or lying up areas for otter within the site. The dense woody cover beyond the north-western boundary on the site (on edge of the SAC) is a linear feature providing good cover and this feature could be used by otter.

Bats

3.2.47 The Wastesavers building structure is considered to provide negligible potential for roosting bats. The small shed is open and provide no potential for roosting bats.

3.2.48 Scrub along the north-western boundary of the site is likely to provide commuting routes and foraging areas for bats along the River Usk corridor.

4 Conclusions and Recommendations

4.1 Designations

4.1.1 The River Usk SAC and SSSI lies only 20m to the northwest of the site. This site is a very large estuarine river system and the development and operation of the site if uncontrolled would have the potential to result in impacts on habitats. Detrimental effects on species for which the site is designated or the overall status of this site are unlikely.

4.1.2 The potential for construction and operational activities to result in impacts on features for which the sites are designated will need to be addressed when the methods for construction and drainage design have been finalised.

4.1.3 It is anticipated that the works will have no effect on any of the five non-statutory SINC sites located within 2km of the Site.

4.2 Habitats

4.2.1 Habitats within the application site are largely restricted to the proposed extension area: comprising ephemeral short perennial vegetation; regenerating grassland with bare ground; and an extensive rubble heap. A strip of butterfly bush scrub, tall ruderal vegetation and rank grassland is present on two of the site boundaries.

4.2.2 All habitats noted have established on this brownfield site within the last five to ten years and are small in extent.

4.2.3 The botanical survey in summer confirmed that a range of pioneer grassland and ruderal plant species has established at the site creating a relatively diverse species assemblage. The majority of the species are commonly occurring on waste ground habitats but a few are specialists of dry substrates or coastal conditions and will have more restricted distribution in the local area. Overall the naturally regenerating habitats are classified as having conservation value in a local context because they are relatively small in extent.

4.2.4 Adjacent scrub habitat comprises common shrub species and is a common habitat type within the Newport area and South Wales. The scrub forms an important buffer between the site and the River Usk SAC/SSSI and disturbance of the scrub habitat outside of the application site should be avoided.

4.3 Species

Mammals

4.3.1 The north-western boundary of the extension site is a potential commuting route/ foraging habitat for bats. Otter uses habitats along the River Usk corridor but the site is considered to have negligible value for this species.

Nesting Birds

4.3.2 Scrub adjoining the application site to the north-west supported a small number of active nests in 2015 with no birds nesting within the site. The maturing butterfly bushes have an open structure of poor suitability and dense cover at ground level is restricted to the narrow boundary banks. The findings of the surveys indicate that there would be no loss of nest sites as a result of the development but that there would be a local reduction in foraging areas for a number of species breeding in the local area including four species of high conservation concern. The site will form part of much wider foraging areas covering many pockets of regenerating ground in the docks area. It is unlikely that a small reduction in foraging area would result in a decline in the population of any of the species resident in the industrial estate and wider dock area.

Great Crested Newt

4.3.3 The pond 90m to the south west of the proposed extension area is considered very unlikely to support great crested newt. It is used as a balancing pond for the wider industrial area to the east of the site and, as a consequence of this, is likely to be highly polluted. The level of pollution also restricts the value of the waterbody for more common species of amphibian, such as smooth newt or common toad.

Reptiles

4.3.4 Under the Wildlife and Countryside Act (1981) it is an offence to intentionally or recklessly kill or injure the common species of reptile native to the UK (higher protection for certain species however habitat for these species is not present on site).

4.3.5 The assessment of the site determined that the habitats had features of potential value for common species of reptile (common lizard and slow worm). Dense cover is provided in the boundary vegetation, many refuge spaces will be present in the rubble mound which will also have the potential to be used for hibernation and there are many opportunities for basking close to cover. Much of the surroundings comprise the built-up areas within the Orb Industrial Estate which act as a partial barrier to movement of animals and reduces the potential for colonisation at the site. The dense scrub habitat on the edge of the River Usk is a narrow strip of potential habitat with limited basking opportunities but providing some connectivity to the wider area.

4.3.6 Neither reptile species was recorded during the presence / absence survey undertaken in spring. Where reptiles are present at very low numbers, individuals can remain undetected but because the site is relatively small the survey gives high confidence in their absence from the application site.

Invertebrates

4.3.7 Overall the survey found a very good species diversity in the proposed extension area. 10 species of the 242 recorded are considered as Key Species being classified as RDB, Nationally Scarce or listed under Section 42 of the NERC Act. Two of the species found have RDB or

equivalent status, but both are probably recent arrivals in the UK, one which is rapidly spreading and very little is known about the second colonising species.

4.3.8 The value of the site for invertebrates relates to the bare ground with sparsely ruderal vegetation and the number of nectar sources for bees. It is recommended that measures are taken to maintain features that would be used by invertebrates in the completed development.

4.3.9 Creating parking areas with a crushed stone surface to allow ruderal vegetation to establish is also significantly constrained. Due to the nature of the development an impermeable surface is an environmental requirement to separate site operations from hydrological receptors. The structural design and load bearing capacity of the building makes a green roof of re are several options for maintaining such features on site.

4.3.10 Based on the nature of the development and the space required to achieve site operations within a small site, it is recommended that land around the boundary of the existing development and proposed extension area should be planted with herbaceous species that will provide food for bees and moths with the mix including important nectar plants such as red clover and common bird's-foot trefoil.

4.3.11 Neither the wormwood moonshiner beetle nor the small ranunculus moth are considered to be present in the application site based on the survey and review of possible food plants.

4.4 Species Protection

Bats

4.4.1 Site lighting design should be sensitive to the function of this feature as a landscape corridor and the design should seek to maintain the use of this feature by wildlife once the area is developed. The lighting design should specifically avoid creating additional light spill onto the scrub habitat to maintain its potential value as a bat flight line.

General

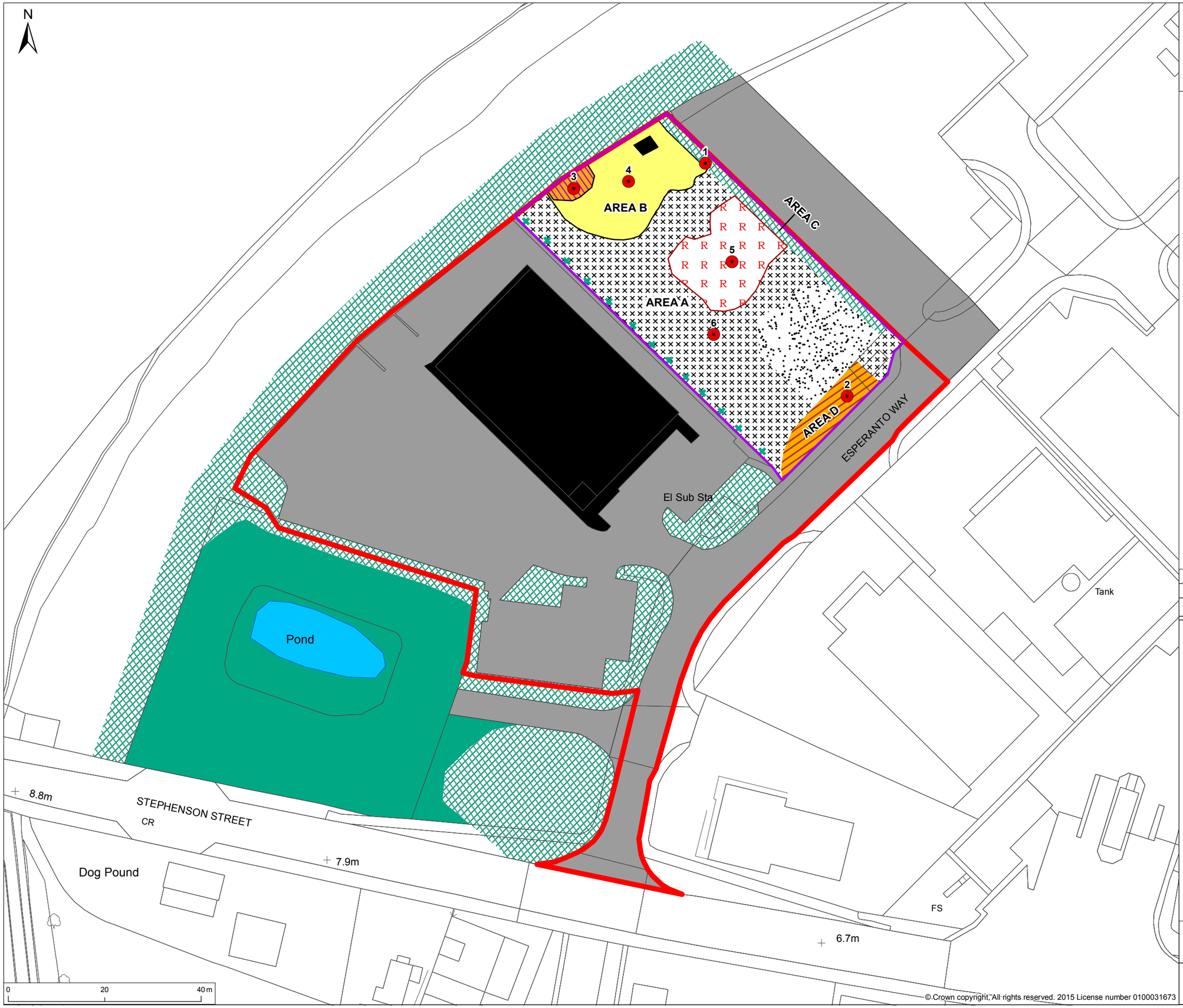
4.4.2 Ideally the rubble mound should be dismantled and removed in autumn (September/October) or spring (March/April) at a time when animals will not be hibernating. Vegetation clearance is best undertaken between September and February outside of the nesting bird season. Should preparation works for site development not commence until after March 2016, a check should be made for nesting birds at the site in advance of clearance operations. Should active nest sites be present, then the nest site should be left undisturbed until the young have fully fledged the nest.

References

Institute of Ecology and Environmental Management (2012). Guidelines for Preliminary Ecological Appraisal.

Joint Nature Conservation Committee (2010). The Handbook for Phase I Habitat Survey. JNCC

Drawing



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Legend

- Site Boundary
- Proposed Works Area
- Dense Scrub
- Regenerating Grassland
- Semi-Natural Woodland
- Tall Ruderal & Neutral Grassland
- Marshy Grassland
- Ephemeral/Short Perennial
- Bare Ground (Crushed Stone)
- Bare Ground (Concrete & Tarmac)
- Building
- Open Water
- Rubble
- Target Note
- Scattered Scrub

Rev	Description	Date	Initial	Checked
B	Updated habitat and works areas	JUL 15	JGB	TO
A	Revised Boundary	FEB 15	RJ	SF

RPS
2420 The Quadrant
Aztec West
Almondsbury
Bristol
BS32 4AQ
T: +44(0)1454 853 000 E: rpssw@rpsgroup.com F: +44(0)1454 205 820

Client WRAP

Project NEWPORT

Title HABITATS MAP

Status	Drawn By	PM/Checked By
PRELIMINARY	RJ	SF
Job Ref	**Scale @ A3**	**Date Created**
JER6447	1:750	JAN 15

Drawing Number **JER6447-ECO-001** Rev **A**

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Appendices

Appendix 1

Botanical Species Lists

Botanical Species

Common Name	Scientific Name	Naturally Regeneating ground (Area A)	Naturally Regenerating Grassland (Area B)	Eastern Boundary Bank (Area C)	Southern Boundary (Area D)
Habitat Classification		Ephemeral/ Short Perennial	Neutral Grassland with Seasonal Standing Water	Tall Ruderal / Scattered Scrub	Tall Ruderal / Neutral Grassland
Percentage Vegetation Cover		20%	80%	90%	90%
American Willowherb	*Epilobium adenocaulon*	LF			L
Annual Meadow-Grass	*Poa annua*	F	O		
Beaked Hawk's-beard	*Crepis vesicaria*	F	O	O	
Bird's-Foot Trefoil	*Lotus corniculatus*		LA	L	
Black Medick	*Medicago lupulina*	L	O / LF		O
Bramble	*Rubus fruticosa*	O	O	O	F / LA
Bristly Oxtongue	*Helminthotheca echioides*	O	R	R	R
Butterfly Bush	*Buddleja davidii*		O	A	O
Cat's Ear	*Hypochaeris radicata*		R		
Changing Forget-Me-Not	*Myosotis discolor*	L			
Clustered Mouse-Ear	*Cerastium glomeratum*	R			
Cock's-foot	*Dactylis glomereta*		R		
Colt's-foot	*Tussilago farfara*	R	O		R
Common Bent	*Agrostis capillaris*		O		O
Common Centaury	*Centaurium erythraea*	F			
Common Daisy	*Bellis perennis*	L	LF		
Common Figwort	*Scrophularia nodosa*	O	O	R	
Common Fleabane	*Pulicaria dysenterica*		F / LA	R	R
Common Mouse-Ear	*Cerastium fontanum*	LF	F	R	
Common Nettle	*Urtica dioica*	L	L		
Common Ragwort	*Jacobaea vulgaris*	R	R	O	R
Common Vetch	*Vicia sativa*	F	F / LA	O	O
Cornsalad	*Valerianella locusta*				L
Creeping Bent	*Agrostis stolonifera*	A	A	O	O / LA
Creeping Buttercup	*Ranunculus repens*	R / LF	R		
Creeping Cinquefoil	*Potentilla reptans*	O / LA	F / LA	O	LF
Creeping Thistle	*Cirsium arvense*	F	L	LF	
Curled Dock	*Rumex crispus*		O	O	
Cut-Leaved Cranesbill	*Geranium dissectum*	R	O	O	
Dandelion	*Taraxacum officianle*	R	R		O
Evening Primrose	*Oenothera biennis*	F	O		
False Fox-Sedge	*Carex otrubae*		L		
False Oat-Grass	*Arrhenatherum elatius*		O/ LF	O / LA	F / LA
Fern Grass	*Catapodium rigidum*	O	O		
Flattened Meadow-Grass	*Poa compressa*	O	O	O	O
Grass Vetchling	*Lathyrus nissolia*		LA		
Great Willowherb	*Epilobium hirsutum*		L		
Greater Bird's-foot Trefoil	*Lotus pedunculatus*		R		
Greater Plantain	*Plantago major*	R	O		
Hairy Sedge	*Carex hirta*		R		
Hairy Tare	*Vicia hirsuta*	L			
Hard Rush	*Juncus inflexus*	R	F / VLA		
Hemlock	*Conium maculatum*				R
Hemp-Agrimony	*Eupatorium cannabinum*	R	O	L	F
Herb-Robert	*Geranium robertianum*		O		
Hoary Mustard	*Hirschfeldia incana*	R		O	R
Hoary Willowherb	*Epilobium parviflorum*	O / LF	F		L
Hogweed	*Heracleum sphondylium*				O
Hop Trefoil	*Trifolium campestre*	L			
Lady's Mantle	*Alchemilla sp.*		R		
Lesser Sea-Spurrey	*Spergularia marina*	R			
Lesser Trefoil	*Trifolium dubium*		O		
Little Mouse-Ear	*Cerastium semidecandrum*	R			
Meadow Buttercup	*Ranunculus acris*	LF	F		O
Mugwort	*Artemsia vulgaris*			R	

Common Name	Scientific Name	Naturally Regeneating ground (Area A)	Naturally Regenerating Grassland (Area B)	Eastern Boundary Bank (Area C)	Southern Boundary (Area D)
Habitat Classification		Ephemeral/ Short Perennial	Neutral Grassland with Seasonal Standing Water	Tall Ruderal / Scattered Scrub	Tall Ruderal / Neutral Grassland
Musk Mallow	*Malva moschata*				R
Ox-Eye Daisy	*Leucanthemum vulgare*		O	R	
Perforate St John's Wort	*Hypericum perforatum*	F	LF	R	R
Pointed Spear-Moss	*Calliergonella cuspidata*	O	LA		
Prominent Pearlwort	*Sagina procumbens*		R		
Red Fescue	*Festuca rubra*		O		O
Reedmace	*Typha latifolia*		L		
Ribwort Plantain	*Plantago lanceolata*	O	L	LF	O
Rosebay Willowherb	*Chamerion angustifolium*				L
Rough Hawkbit	*Leontodon hispidus*	R			
Rough Meadow-Grass	*Poa trivialis*		O	LA	O/LF
Scarlet Pimpernel	*Anagallis arvensis*	O			
Scented Mayweed	*Matricaria chamomilla*	F			
Sea Plantain	*Plantago maritima*	L			
Self-Heal	*Prunella vulgaris*	O	LF	O	
Smooth Meadow-Grass	*Poa pratensis*	F	F	O	O
Smooth Sow-thistle	*Sonchus oleraceus*	O	O	F	
Soft Brome	*Bromus hordeaceus*	R			
Squirrel-Tail Fescue	*Vulpia bromoides*	L			
Teasel	*Dipsacus fullonum*	R	R	O	O
Toad Rush	*Juncus bufonius*	LA			
Thyme-Leaved Sandwort	*Arenaria serpyllifolia*				L
Traveller's Joy	*Clematis vitalba*		O	R	
Tufted Vetch	*Vicia cracca*		R		
Wall Speedwell	*Veronica arvensis*	O	LF		
Weld	*Reseda luteola*				L
White Clover	*Trifolium repens*	R	LF	R	
Wild Carrot	*Daucus carota*	O		O	
Wild Parsnip	*Pastinaca sativa*	L	O	R	F
Yellow Flag	*Iris pseudacorus*		L		
Yorkshire Fog	*Holcus lanatus*	F	F	O	O
Poplar Seedling	*Populus sp.*	O			
Poplar Sapling	*Populus sp.*		O		
Willow Seedling	*Salix sp.*	O	O		
Willow Sapling	*Salix sp.*		O		
Birch Seedling	*Betula pendua*	O			
Birch Sapling	*Betula pendua*		O		
Hawthorn (seed)	*Crataegus monogyna*		O		

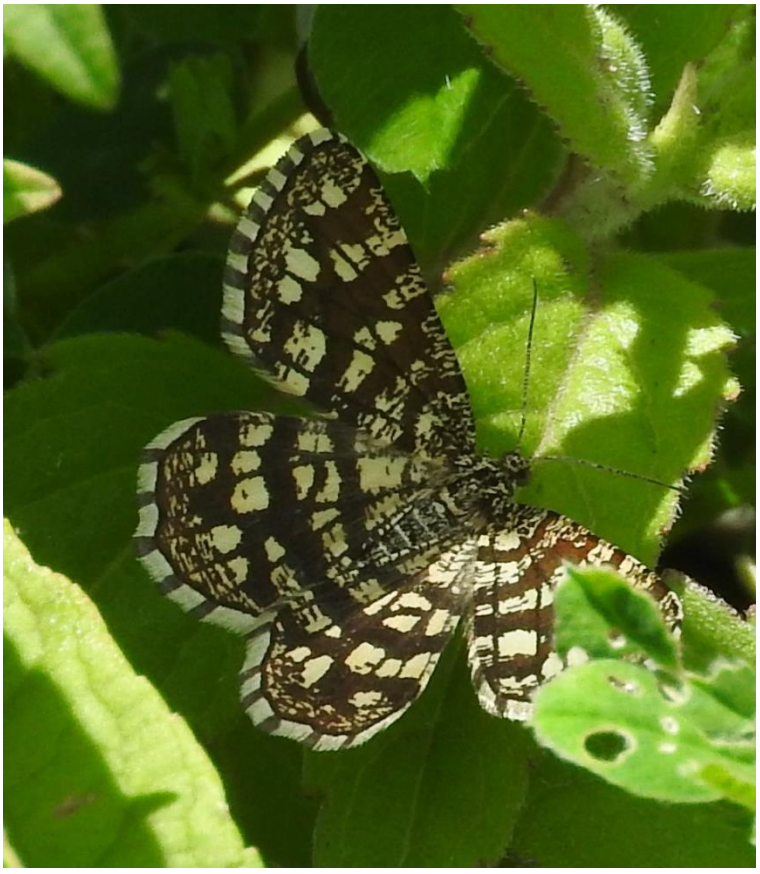
Appendix 2

Invertebrate Survey Report

AN INVERTEBRATE SURVEY OF BROWNFIELD LAND, WASTESAVERS, NEWPORT

David J. Gibbs

21 July 2015



This report was produced for RPS.

David J. Gibbs
6 Stephen Street
Redfield
BRISTOL
BS5 9DY
david.usia@blueyonder.co.uk

This report should be quoted as:

Gibbs, D.J (2015). An invertebrate survey of Brownfield land, Wastesavers, Newport. Report to RPS.

Cover photograph: *Chiasmia clathrata* (Latticed Heath).

Contents

List of Figures

1 Summary

- The three days of terrestrial sampling produced a diversity of 242.
- Of these 11 (4.6%) are considered here as Key Species, two of them of RDB quality.
- Although this is a high diversity, quality not very high.
- While most key species are known to have good populations locally, some are otherwise rarely recorded in South Wales.
- The two BAP/S41 species and 5-spot Burnet are important finds.
- 5-spot Burnet and Brown-banded Carder Bee both require a larger area than this small site affords and are indicative of the wider value of the mosaic of habitats in the Newport Docks area.
- Some level of mitigation highly desired.

2 Introduction

A very small area of fenced brownfield land, mostly hard-core, rubble and sandy areas, some of it becoming well vegetated, other areas still with a predominance of bare substrate still exposed. Apart from general survey to assess the presence of species of conservation significance, techniques were employed to increase the probability of recording *Amara fusca*, a very rare beetle recorded in the area once. Outside the main area some very limited habitat exists in the form of planted borders, but was not of sufficient size to survey.

3 Survey Methodology

3.1 SAMPLING TECHNIQUES

3.1.1 Timed sweeping

On the first two visits (28 May and 8 June) the whole site was sampled using a sweep-net, timed for one hour. This was the most productive technique, finding 122 species. Most of these are flying insects and species that frequent the grass and herbage canopy and are attracted to flowers.

Sweep-netting was done with a 40 cm diameter white-bag net swept steadily from side to side as one paces steadily through the grass, herbage or under-storey vegetation. Specimens were extracted from the net with a pooter or, in the case of larger specimens, individually potted in 30ml soda glass tubes. When sampling was completed or the pooter became too full the contents were killed with ethyl acetate then transferred to 30ml soda glass tubes together with a data label.

3.1.2 Spot search

As an adjunct to sweeping, the spot sampling is designed to search for larger insects not readily sampled by sweeping, and signs of insects, such a leaf-mines and galls. Again it was timed at one hour and was done on 15 June. This is not a technique that produces a large species list but is particularly good at recording bumblebees and butterflies and other fast-flying species. Samples preserved as for sweep-netting.

3.1.3 Vacuum sampling

The very short sward and almost bare substrate, prevalent across much of the site, renders it particularly appropriate to be sampled using this technique. The apparatus is an ordinary 2-stroke garden blower, using the intake with a net over the tube. It is very efficient at recording small, ground-dwelling invertebrates that are rarely captured with a sweep-net. This technique was used on 28 May and 8 June, with four samples taken each time. With the machine

running at full power, the intake tube is placed on the ground in 10 spots for a few seconds each. The net is then inverted into a plastic tray and invertebrates collected into a pooter. Samples preserved as for sweep-netting.

3.1.4 Pit-fall trapping

The classic technique for grown-dwelling invertebrates, particularly useful for sampling species that are nocturnal or crepuscular as the traps remained in position between the three visits. Plastic cups were sunk into the substrate, a small amount of ethylene glycol (antifreeze) poured into the bottom and a cover placed over it to prevent dilution by rain. Two lines of four traps each were placed, plus one more near an *Artemesia* plant. The very compacted hard-core substrate made it very difficult to dig traps in so it proved impossible to do more than these. The traps were set on 28 May and emptied on 8 and 15 June.

The sample points are marked on the map (Fig 1).

Figure 1 Map showing sample compartments sampling points.

3.2 SAMPLE TIMING

The site was visited on three occasions in late May into the first half of June. On the 28 May the traps were laid, which took several hours because of the very hard surface. The remainder of the day was used for a one hour sweep-net sample and taking four vacuum samples. This visit was timed entirely as the earliest date that I could get into field after contract finalised. The second visit on 8 June was to empty the first week of pit-fall trapping, the remainder of the day was absorbed resetting the traps, many of which had become lifted from their recesses

by heavy rain, and then taking another sweep-net sample and four more vacuum samples. The final visit on 15 June was timed to allow sufficient identification time before report deadline. The traps where emptied and removed, the remainder of the day used to do a spot survey.

3.3 CONSTRAINTS

Every attempt was made to visit in sunny, dry conditions, and on the three visits the weather was mostly dry and on the second two, warm. However, heavy rain between setting the traps and retrieving the first sample might have compromised the catching ability of the first trap run. However, all traps had some invertebrates so this is unlikely to be seriously detrimental.

The major constrain is the very short period over which the survey was done. Ideally a survey should start in early spring, especially in the case of a thermophilous brown-field site such as this, and continue through the season. In this particular case the desire to look for the Carabid *Amara fusca*, makes the timing problematical. This very rare species is hardly ever seen as an adult outside the autumn, so a May/June survey really has no chance of finding it.

3.4 IDENTIFICATION

Where practical, invertebrates were identified in the field but wherever the slightest doubt existed, one or more specimens were collected for more detailed scrutiny. To achieve rigorously accurate identifications, specimens were identified using the author's own library and entomological collection. Where these proved insufficient, specimens were submitted to relevant experts. Selected specimens have been retained in the author's personal collection as vouchers.

3.5 TAXONOMIC COVERAGE

It is desirable that as wide a taxonomic range as possible is identified, in order to sample numerous ecological types, i.e. invertebrates with widely differing natural histories. As there was only a limited amount of time available for identification, it was important to name the more readily identified groups which do not require very time consuming techniques or are out with the experience of the worker.

The following orders and families of invertebrates were named to species.

Araneae & Opiliones – Spiders & harvestmen

Isopoda - woodlice

Myriapoda & Chilopoda – Millipedes & Centipedes

Coleoptera – **Beetles** (all except Meligethes, small Aleocharine rove beetles and other very small obscure families)

Diptera - True Flies (except, Cecidomyiidae, Chironomidae, Ceratopogonidae, Simulidae, Phoridae, Sphaeroceridae, and females of some groups which are not identifiable).

Hemiptera, Auchenorrhyncha - Froghoppers, Leafhoppers and Planthoppers (excluding females of difficult genera)

Hemiptera, **Heteroptera - True Bugs** (excluding smaller Miridae)

Hymenoptera, Aculeata - Ants, wasps and bees

Hymenoptera, Symphyta - Sawflies (excluding Nematinae)

Lepidoptera – Butterflies and Moths

Odonata - Dragonflies and Damselflies

Mecoptera - Scorpionflies

Neuroptera - Lacewings

Orthoptera – Grasshoppers and crickets

Mollusca – Slugs and snails

3.6 ANALYSIS

A system of British conservation statuses has been in use since the Red Data Book for insects (Shirt 1987), amended and supplemented by a series of JNCC Nature Conservation reviews (e.g. Falk 1991a; Falk 1991b). By this system, the rarest and most threatened species are given one of the Red Data Book (RDB) statuses. Species which do not qualify as RDB but are nonetheless uncommon are given one of the Nationally Scarce statuses. The status categories and criteria relevant to this report are defined in Appendix 1.

'Key Species' are here defined by the following categories:

- British Red Data Book (RDB) and Nationally Scarce species (including statuses from JNCC texts which are published, 'in press' or 'in prep.'); and
- species formerly regarded as either RDB or Nationally Scarce but recently downgraded.

For site assessment, the percentage of Key Species is a useful guide to the overall quality of the site for invertebrates, in comparison to other sites surveyed by the authors using similar techniques. Higher quality sites support higher percentages of Key Species. To enable a fair comparison to survey data accumulated by the authors over many years, species formerly regarded as either RDB or Nationally Scarce but recently downgraded are still treated as Key Species.

There are numerous examples of invertebrates which have been listed as either RDB or Nationally Scarce and have subsequently been found to be more widespread and abundant, either as a result of actual increase in range size or population size, or as a result of improved understanding by entomologists of how to find or identify them. Where the authors regard the official conservation status to be out of date, this will be indicated in the Key Species accounts (section 5).

4 Results

4.1 OVERALL RESULTS

The survey identified 242 species of invertebrate (Appendix 2), a very good diversity for such a tiny site surveyed over so short a period. A broad range of invertebrate groups was covered to a greater or lesser extent and the species list includes representatives of the following groups: slugs & snails, isopods, centipedes & millipedes, spiders, crickets & groundhoppers, earwigs, true bugs, froghoppers & leafhoppers, moths, butterflies, beetles, true flies, sawflies, ants, wasps and bees. The wide range of techniques used for terrestrial sampling captured the major groups very evenly with Diptera the greatest number (61 species, 25%). The second largest group found was Coleoptera (58 species, 24%), then Spiders (34 species14%), followed by Hymenoptera (27 species, 11%).

Of the 242 species identified by this survey, 11 (4.6%) are considered here as Key Species (defined in section 3.6). 4.6% is a not a very high proportion of Key Species, however, it is difficult to make a good judgement because there are few comparable areas that have been surveyed using the same suite of techniques. If we take just the sweep-net sample, which can be compared to other sites similarly sampled, then the proportion is 9%, which is rather high. This suggests that the site overall has some conservation potential, and that some level of mitigation might be needed. Only two species found (0.8%) have RDB or equivalent status, both probably recent arrivals in the UK, one doing very well, the second as yet very little known.

An analysis of the key species found reveals that most are individually not of great conservation concern. Amongst the few that really do merit attention are the two BAP species and *Zygaena ?trifolii*. For all three of these species, the tiny area surveyed at Wastesavers, is nowhere near large enough to support a viable population by itself, but their presence on the site shows that this small area contributes to the wider conservation value of the mosaic of semi-natural habitats in the area.

5 Key Species

5.1 RED DATA BOOK

5.1.1 *Zodarion fuscum* (RDBK)

This small spider is a recent discovery in Britain, so far recorded in numbers from three locations since 1992; a disused railway line in Wiltshire, coastal shingle in Glamorgan, and a brownfield site in Nottingham, which has probably been lost to development. Although it has no official status, and might be an introduction and greatly under-recorded, a provisional RDB status seems appropriate given just 4 previous records (one of them lost), with just a single site in Wales. The species presumably needs a relatively warm habitat. In Wiltshire, it has been found in situations well exposed to the sun, where there are plenty of bare surfaces and gaps between stones, gravel, etc. which provide refuges at all the sites. It seems that females may be adult all year, males in June (britishspiders.org.uk). Found in good numbers in both pitfall trap lines.

5.1.2 *Tephritis matricariae* (RDBK)

This gallfly with patterned wings was only added to the British list in 2000 based on specimens found in April of that year at Sandwich Bay (Clemons 2000). Since then it has spread rapidly around the Kent coast and with a few records inland (Clemons 2004) and it is now recorded in London (NBN). It is clearly colonising this country fast but this is my first record for Wales. This rapid spread has clearly rendered this species of lower conservation concern than RDB, and might no longer even merit Nationally Scarce status. The original records were from the dunes at Sandwich and since it has been found on grassy areas in Canterbury and chalk downland between Folkestone and Dover. The larvae develop in the capitula of *Crepis* with *vesicaria, taraxacifolia* and *capillaris* the most likely species to be favoured (Clemons 2000). Adults seem to be active from April to September. Several specimens swept.

5.2 NATIONALLY SCARCE

5.2.1 *Meligethes fulvipes* Nationally Scarce

This tiny black pollen beetle with reddish legs is widespread in England and South Wales but very local and scattered. Usually found near the coast and in marshy places inland. It is associated with white mustard *Sinapis arvensis* (Hyman 1994). Probably under-recorded and recently found in good numbers on a similar site near Avonmouth (pers. obs.). Swept from crucifer plants along the SE boundary.

5.2.2 *Meligethes rotundicollis* Nationally Scarce

Another tiny black pollen beetle, also associated with crucifers, recorded from southeast England and the midlands. I am not aware of any records from Wales. Occurs along field margins, roadsides, waste places where they can be found on *Sinapis arvensis* and *Sisybrium officinale*. Adults recorded in April, June to August (Hyman 1994). Swept from crucifer plants along the SE boundary.

5.2.3 *Longitarsus rutilus* Nationally Scarce a

This small, orangey-yellow flea-beetle has a very southern distribution south of the Thames and Gloucester, and with no records from Wales (Cox 2007). The host plant is Figworts, especially *Scrophularia auriculata* (Water Figwort) and *S. nodosa* (Common Figwort), the adults eating small holes in the leaves. Larvae probably develop at the roots. Adults recorded most months, peaking in June. Several specimens swept from Figwort.

5.2.4 *Chrysotus suavis* (Nationally Scarce) None

This tiny metallic green Dolichopodid fly is widespread in England north to Northumberland and South Wales but now known from 12 counties so recently had its national status removed (Falk & Crossley 2005). In South Wales it is frequent on the Gwent Levels (pers. obs.). A coastal species usually found on dunes, also with records from a gravel pit and the sandy Brecks. Adults in June and July (Fonseca 1978). Swept and found in vacuum sample on less vegetated part of site.

5.2.5 *Platycheirus immarginatus* Nationally Scarce

This black and orange hoverfly is very widespread in Britain but very local and mostly coastal, particularly frequent in South Wales, especially in the western part. In Gwent it is frequently met with on the Levels. Usually found in brackish marshes and saltmarsh where they sometimes visit the flowers of Sea Club-rush. The larvae feed on the aphid *Trichocallis cyperi* on Carex. Adults recorded from May to September (Ball & Morris 2000). A rather surprising find given the habitat, probably a satellite of a population along the Usk.

5.2.6 *Pherbellia griseola* Nationally Scarce

This snail-killing fly is widespread in Britain but very local with about 30 known post 1960 sites. In South Wales there are a few records in the Swansea area, also on the opposite side of the Severn at Avonmouth (pers. obs.). It is recorded from a wide variety of habitats, mainly fens and bogs but also wet woodlands, there is apparently a requirement for standing water. The larvae develop as parasitoides of aquatic snails, adults recorded from May to September (Falk 1991b). Found in southern corner in sparsely vegetated area.

5.2.7 *Tetanocera punctifrons* Nationally Scarce

One of the larger snail-killing flies which is widely distributed in Britain but local with about 20 post 1960 sites (Falk 1991b). In South Wales not infrequent with several records from Swansea area and Gwent Levels (pers. obs.). It is becoming increasingly frequent and perhaps no longer merits its national status. Inhabits damp woodland, riparian situations, damp heathland and coastal marshes. The larvae probably develop as predators or parasitoides of snails; adults are recorded from June to August (Falk op.cit.). Swept and found in vacuum samples in norther, better vegetated part.

5.2.8 *Coenosia atra* Nationally Scarce

Records are scattered widely in Central and Southern England including South Wales (Glamorgan), but appears to be very scarce in region. The species seems to have been increasing over the last two decades. Usually encountered in marshy areas on heaths, *Juncus* and *Carex* fens, and dune slacks. Its biology is unknown; adults are on the wing from June to September (Falk & Pont in prep.). Swept on 8 June.

5.2.9 *Hylaeus signatus* Nationally Scarce a

This is the largest of the yellow-faced bees and is widespread in southern England north to Norfolk and Warwickshire with about 30 post-1970 sites (Falk 1991a). There was evidence that this bee was becoming commoner, with many more sites found in the 1990's (M. Edwards pers.comm.) but over the last few years it has become scarce again, just very recently showing some recovery. In South Wales there are very few records, just three hectads towards Swansea (Collins & Roy 2012). Occurs on downland, heathland, disturbed situations,

gardens and open woodlands. It is closely associated with *Reseda* from which the adults collect all their pollen. Nests are known from banks with bare soil, the mortar in walls or in the dead stems of *Rubus* or *Rosa*. It is single brooded with adults found from June to September (Falk op.cit.). Several noted around a patch of Reseda luteola in SE corner of site.

5.3 BAP-S41, LOCALLY SIGNIFICANT

5.3.1 *Zygaena ?trifolii* ?Five-spot Burnet Locally significant

This very attractive, day-flying moth has declined dramatically in the last 50 years and there are now few confirmed sites, confusion with Narrow-bordered Five-spot Burnet *Zygaena lonicerae* is such that few records can be relied upon. In South Wales I have records further west near Swansea and Neath, but in the eastern part of wales it is likely to be rarely encountered. This species cannot be identified with certainty unless a caterpillar is found and reared, however, this individual had all the indicative features and the food plant of the confusion species was not found.

5.3.2 *Chiasmia clathrata* Latticed Heath BAP/S41

A geometrid moth of a wide range of open habitats: grasslands, heathland, open woodland, cliffs, etc. The larvae feed on various species of clovers. It was described by Skinner (1984) as 'widespread and locally common in England, Wales and southern Scotland' and as 'common' by Waring & Townsend (2003). However, Fox et al. (2006) reported a decline of 87% over 35 years for this species. Has a rather scattered distribution in South Wales, rarely noted in Gwent (NBN). The indications are that action for this species will cover national monitoring and research programmes, and action through national agricultural and forestry policy measures. A good population present on the site.

5.3.3 *Bombus humilis* Brown-banded Carder Bee BAP/S41

The Brown-banded Carder Bee has declined dramatically in recent decades, although not included in Falk (1991a) it should now be viewed as Nationally Scarce. Historically widespread in England and Wales, it is now largely confined to local populations in the south and west. South Wales, including the Gwent Levels, is a stronghold for this species (NBN). Bumblebee populations appear to operate at a landscape scale and it is probable that viable individual populations require minimum ranges of between ten to twenty sq. km of good matrix habitat within farmland. Found on a variety of open, flower-rich situations, dunes, salt-marsh edges, shingle beaches, chalk downland and heathland. Important plant species used in early summer by queens include Fodder Vetch *Vicia villosa*, Red Clover *Trifolium pratense* and Broad-leaved Everlasting-pea *Lathyrus latifolius*. Workers forage on the flowers of species such as bird's-foot trefoils *Lotus spp*., clovers, Black Horehound *Ballota nigra*, Lucerne *Medicago sativa* and Red Bartsia *Odondites verna*. Individuals noted on two occasions so there is clearly a good population locally.

6 Site Evaluation

6.1 OVERALL ASSESSMENT

Despite the brief nature of this survey, and especially the limited temporal cover, it is clear that this site has some conservation value, and perhaps particularly, contributes measurably to the wider landscape value. Had it been possible to survey early spring and later in the season, it is highly likely that more important species would be found. It is very difficult to make direct comparisons with other surveys of similar habitats because most comparable survey would span a greater part of the season and not use such a wide range of sampling techniques. It is also difficult to know to what extent the species found are reliant on just this very small parcel of land, and to what extent its importance is only within the context of the wider landscape. Throughout this part of Newport there are many areas of ruderal habitat and rough

ground, verges etc. together making up a complex mosaic of habitats that as a whole provide resources for some important species.

Of the two target species that were highlighted as potentially occurring, one of them, *Hecatera dysodea* (Small Ranunculus), is not breeding on the here as the food plant, *Lactuca serriola* (Prickly Lettuce) is not present. Even if it were the food plant is widespread in the area and the moth is now so well established that it is no longer of conservation concern.

The other species, *Amara fusca* (Wormwood Moonshiner), is more problematical, as mention in section 3.3 Constraints above. However, despite this survey not covering the time of year when adults of this ground beetle are active, some deductions can be made from the habitat. The primary food plant of *A. fusca Artemisia campestris* (Field Wormwood), and presumably in South Wales *A. crithmifolia* (Dune Wormwood) is not present on the site, and indeed is functionally extinct in South Wales, only reintroduced plants now surviving in any number. Presumably the single record of *A. fusca* in the Newport Docks area was surviving on its secondary host-plant, *Artemesia vulgaris* (Mugwort). This plant does occur on site, but in limited amounts; just two clumps were noted, plus a few small sprigs along the SE boundary. Further, *A. vulgaris* occurs in abundance outside the site along roadsides and factory sites in the area. So even if *A. fusca* does occasionally use this site, it would have to be of very limited importance, and if a viable population of *A. fusca* occurs in Newport, then this will be predominantly elsewhere, and any contribution from this site will be insignificant.

7 Recommendations

Development of this site needs to take the above factors into account, with some measures taken to allow the open areas around the development to continue to contribute the value of the wider area.

Unfortunately the very limited size of this site leaves limited scope for on-site mitigation. However, any areas that are not built on could be used for mitigation to some extent, especially to ensure the site continues to contribute to the wider habitat, even if to a reduced extent.

There are two habitat feature that should be maintained wherever possible 1. Ruderal, 2. Nectar sources for bees. There are several options for maintaining such features on site.

1. Green roof. This is the best option but obviously means the building must be strong enough to support such a feature, but if it was possible, then the very open, sparsely vegetated, drought-prone habitat that occupies the greater part of the site could easily be re-created on a roof.
2. Parking areas can contribute if they can be made from porous surface, perhaps with a plastic stabilising layer. This would allow small ruderal plants to persist and can mimic the very bare, open, sunny areas in part of the present site.
3. Borders, rather than be planted with non-native shrubs, can be seeded with native plants from the site to be developed, supplemented with important nectar plants such as *Trifolium pratense* (Red Clover) for bees and *Lotus corniculatus* (Common Bird's-foot-trefoil) for bees and brunet moths.

Outside the proposed extension development area there are also parking areas and borders currently planted with shrubs which could be treated similarly.

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9 Appendix 1: British conservation status categories – definitions.

These status categories and criteria were introduced for British insects by Shirt (1987) and received some modifications by later authors (e.g. Hyman and Parsons (1992, 1994)).

Red Data Book category EXTINCT

Definition Species which were formerly native to Britain but have not been recorded since 1900.

Red Data Book category 1, Endangered

Definition Species in danger of extinction and whose survival is unlikely if causal factors continue to operate. Endangered species either (a) occur as only a single population within one 10-km square, or (b) only occur in especially vulnerable habitats, or (c) have been declining rapidly or continuously for twenty years or more to the point where they occur in five or fewer 10-km squares, or (d) may already have become extinct.

Red Data Book category 2, Vulnerable

Definition Species which are likely to move into the Endangered category in the near future if causal factors continue to operate. Vulnerable species are declining throughout their range or occupy vulnerable habitats.

Red Data Book category 3, Rare

Definition Species which occur in small populations and although not currently either Endangered or Vulnerable are at risk. Rare species exist in 15 or fewer 10-km squares, or are more widespread than this but dependent on small areas of especially vulnerable habitat.

Red Data Book category I, Indeterminate

Note: Best written as ‘RDBi’ rather than ‘RDBI’ as the latter is easily confused with ‘RDB1’ (Endangered).

Definition Species considered to be either Endangered, Vulnerable or Rare but with insufficient information to say which.

Red Data Book category K, Insufficiently Known

Definition Species suspected to merit either Endangered, Vulnerable, Rare or Indeterminate status but lacking sufficient information. Species included in this category may have only recently been discovered in Britain, or may be very poorly recorded for a variety of reasons.

Nationally Scarce Category A, Na.

Definition Species which do not fall within Red Data Book categories but which are nonetheless uncommon in Great Britain and thought to occur in 30 or fewer (typically between 16 and 30) 10-km squares of the National Grid, or for less well-recorded groups, in seven or fewer vice-counties.

Nationally Scarce Category B, Nb.

Definition Species which do not fall within Red Data Book categories but which are nonetheless uncommon in Great Britain and thought to occur in between 31 and 100 10-km squares of the National Grid, or for less well-recorded groups, between eight and twenty vice-counties.

Nationally Scarce, N.

Definition Species which do not fall within Red Data Book categories but which are nonetheless uncommon in Great Britain. This status category has been used where

information has not been sufficient to allocate a species to either Na or Nb. These species are thought to occur in between 16 and 100 10-km squares of the National Grid.

10 Appendix 2: Species list.

Order: Family	Species	Vernacular	National Status	Sweep	Spot	PF1	PF2	PF3	Vac A	Vac B
Gastropoda: Cochlicopidae	*Cochlicopa lubricella*								X	
Gastropoda: Vertiginidae	*Vertigo pygmaea*	Common Whorl Snail							X	X
Gastropoda: Pupillidae	*Lauria cylindracea*	Common Chrysalis Snail								X
Gastropoda: Boettgerillidae	*Boettgerilla pallens*	Worm Slug		X						
Gastropoda: Agriolimacidae	*Deroceras reticulatum*	Field (Netted?) Slug		X						
Gastropoda: Helicidae	*Trichia striolata*	Strawberry Snail				X	X		X	X
Gastropoda: Helicidae	*Trichia hispida*	Hairy Snail				X				X
Isopoda: Philosciidae	*Philoscia muscorum*	Common Striped Woodlouse					X	X	X	X
Isopoda: Oniscidae	*Oniscus asellus*	Common Shiny Woodlouse				X	X		X	X
Isopoda: Armadillidiidae	*Armadillidium nasatum*	a pill woodlouse				X	X	X	X	X
Isopoda: Armadillidiidae	*Armadillidium vulgare*	Common Pill Woodlouse				X	X	X		X
Isopoda: Porcellionidae	*Porcellio scaber*	Common Rough Woodlouse				X	X	X	X	
Myriapoda: Julidae	*Cylindroiulus caeruleocinctus*	a millipede						X		
Myriapoda: Julidae	*Cylindroiulus britannicus*	a millipede						X		
Myriapoda: Julidae	*Ophyiulus pilosus*	a millipede				X		X		
Myriapoda: Polydesmidae	*Polydesmus angustus*	Common Flat-backed Millipede			X		X	X		
Chilopoda: Henicopidae	*Lamyctes emarginatus*					X	X			
Chilopoda: Lithobiidae	*Lithobius forficatus*							X		
Chilopoda: Lithobiidae	*Lithobius microps*					X	X	X		
Opiliones: Phalangiidae	*Lacinius ephippiatus*					X				
Araneae: Dysderidae	*Dysdera crocata*						X			
Araneae: Theridiidae	*Theridion sisyphium*			X						
Araneae: Theridiidae	*Enoplognatha thoracica*						X			
Araneae: Theridiidae	*Robertus arundineti*					X				
Araneae: Linyphiidae	*Oedothorax fuscus*					X				

Araneae: Linyphiidae	*Oedothorax retusus*					X				
Araneae: Linyphiidae	*Monocephalus fuscipes*							X		
Araneae: Linyphiidae	*Erigone dentipalpis*					X				X
Araneae: Linyphiidae	*Erigone atra*					X				
Araneae: Linyphiidae	*Erigone promiscua*					X			X	
Araneae: Tetragnathidae	*Pachygnatha degeeri*					X				
Araneae: Lycosidae	*Pardosa palustris*					X	X			
Araneae: Lycosidae	*Pardosa pullata*						X	X		
Araneae: Lycosidae	*Pardosa prativaga*					X	X	X	X	X
Araneae: Lycosidae	*Pardosa amentata*					X				
Araneae: Lycosidae	*Pardosa proxima*						X			X
Araneae: Lycosidae	*Alopecosa pulverulenta*						X			
Araneae: Lycosidae	*Arctosa perita*					X				
Araneae: Lycosidae	*Arctosa leopardus*					X	X			
Araneae: Lycosidae	*Pirata piraticus*					X				
Araneae: Hahniidae	*Hahnia nava*					X	X			
Araneae: Liocranidae	*Phrurolithus festivus*					X	X			X
Araneae: Zodariidae	*Zodarion fuscum*		**(RDBK)**			X	X			
Araneae: Gnaphosidae	*Drassodes lapidosus*					X	X			
Araneae: Gnaphosidae	*Micaria pulicaria*					X	X			
Araneae: Philodromidae	*Philodromus cespitum*				X					
Araneae: Thomisidae	*Misumena vatia*			X						
Araneae: Thomisidae	*Xysticus cristatus*					X				
Araneae: Thomisidae	*Ozyptila sanctuaria*						X			
Araneae: Salticidae	*Salticus scenicus*			X						
Araneae: Salticidae	*Heliophanus cupreus*					X				X
Araneae: Salticidae	*Heliophanus flavipes*					X			X	X
Araneae: Salticidae	*Euophrys frontalis*					X				
Araneae: Salticidae	*Talavera aequipes*									X
Orthoptera: Phaneropteridae	*Leptophyes punctatissima*	Speckled Bush Cricket			X					
Orthoptera: Tetrigidae	*Tetrix subulata*	Slender Ground Hopper		X		X	X			
Dermaptera: Forficulidae	*Forficula auricularia*	Common Earwig						X		
Hemiptera: Anthocoridae	*Orius niger*								X	

Hemiptera: Lygaeidae	*Cymus glandicolor*									X
Hemiptera: Lygaeidae	*Cymus melanocephalus*			X						
Hemiptera: Lygaeidae	*Drymus sylvaticus*								X	
Hemiptera: Lygaeidae	*Ischnodemus sabuleti*			X						
Hemiptera: Lygaeidae	*Kleidocerys resedae*			X						
Hemiptera: Lygaeidae	*Scolopostethus affinis*			X						
Hemiptera: Lygaeidae	*Scolopostethus puberulus*								X	
Hemiptera: Lygaeidae	*Scolopostethus thomsoni*			X						
Hemiptera: Miridae	*Capsus ater*									X
Hemiptera: Miridae	*Stenodema calcarata*			X						
Hemiptera: Miridae	*Stenodema laevigata*			X						
Hemiptera: Nabidae	*Himacerus mirmicoides*					X			X	X
Hemiptera: Tingidae	*Acalypta parvula*					X				
Hemiptera: Coreidae	*Coriomeris denticulatus*	Denticulate Leatherbug		X						X
Hemiptera: Pentatomidae	*Dolycoris baccarum*	Hairy Shieldbug		X						X
Hemiptera: Aphrophoridae	*Aphrophora alni*				X					
Hemiptera: Aphrophoridae	*Neophilaenus campestris*			X					X	
Hemiptera: Cicadellidae	*Viridicerus ustulatus*			X						
Hemiptera: Cicadellidae	*Anaceratagallia ribauti*								X	X
Hemiptera: Cicadellidae	*Anoscopus albifrons*									X
Hemiptera: Cicadellidae	*Psammotettix confinis*						X		X	
Lepidoptera: Zygaenidae	*Zygaena ?trifolii*	?Five-spot Burnet			X					
Lepidoptera: Coleophoridae	*Coleophora follicularis*			X	X					
Lepidoptera: Gelechiidae	*Bryotropha terrella*			X						
Lepidoptera: Tortricidae	*Celypha lacunana*				X					
Lepidoptera: Pyralidae	*Eudonia mercurella*									X
Lepidoptera: Pterophoridae	*Adaina microdactyla*			X						
Lepidoptera: Hesperiidae	*Thymelicus lineola*	Essex Skipper							X	
Lepidoptera: Hesperiidae	*Ochlodes sylvanus*	Large Skipper			X					
Lepidoptera: Nymphalidae	*Maniola jurtina*	Meadow Brown			X					
Lepidoptera: Lycaenidae	*Aricia agestis*	Brown Argus			X					
Lepidoptera: Lycaenidae	*Polyommatus icarus*	Common Blue		X	X					
Lepidoptera: Geometridae	*Camptogramma bilineata*	Yellow Shell			X					

Lepidoptera: Geometridae	*Chiasmia clathrata*	Latticed Heath	**BAP S41**	X	X					
Lepidoptera: Geometridae	*Cabera exanthemata*	Common Wave		X						
Lepidoptera: Noctuidae	*Noctua pronuba*	Large Yellow Underwing							X	
Lepidoptera: Noctuidae	*Autographa gamma*	Silver Y			X					
Lepidoptera: Noctuidae	*Euclidia glyphica*	Burnet Companion		X	X					
Coleoptera: Carabidae	*Nebria brevicollis*					X	X			
Coleoptera: Carabidae	*Notiophilus substriatus*									X
Coleoptera: Carabidae	*Dyschirius politus*					X				
Coleoptera: Carabidae	*Bembidion lampros*					X	X			
Coleoptera: Carabidae	*Bembidion properans*					X	X			X
Coleoptera: Carabidae	*Agonum muelleri*					X	X		X	
Coleoptera: Carabidae	*Amara aenea*					X				X
Coleoptera: Carabidae	*Harpalus affinis*					X	X	X		X
Coleoptera: Carabidae	*Anisodactylus binotatus*					X	X			
Coleoptera: Carabidae	*Acupalpus parvulus*								X	
Coleoptera: Carabidae	*Syntomus foveatus*					X				X
Coleoptera: Hydrophilidae	*Megasternum concinnum*							X		
Coleoptera: Staphylinidae	*Tachyporus pusillus*								X	
Coleoptera: Staphylinidae	*Bledius opacus*					X				
Coleoptera: Staphylinidae	*Stenus nanus*									X
Coleoptera: Staphylinidae	*Stenus brunnipes*									X
Coleoptera: Staphylinidae	*Stenus ossium*									X
Coleoptera: Staphylinidae	*Paederus littoralis*									X
Coleoptera: Staphylinidae	*Quedius schatzmayri*					X				
Coleoptera: Byrrhidae	*Simplocaria semistriata*					X				
Coleoptera: Byrrhidae	*Cytilus sericeus*					X	X			X
Coleoptera: Elateridae	*Agriotes lineatus*					X				
Coleoptera: Nitidulidae	*Meligethes fulvipes*		**Nationally Scarce**	X						
Coleoptera: Nitidulidae	*Meligethes rotundicollis*		**Nationally Scarce**	X						
Coleoptera: Phalacridae	*Olibrus aeneus*								X	
Coleoptera: Phalacridae	*Olibrus liquidus*			X					X	X
Coleoptera: Coccinellidae	*Rhyzobius litura*			X		X			X	X
Coleoptera: Coccinellidae	*Nephus redtenbacheri*								X	X

Coleoptera: Coccinellidae	*Psyllobora vigintiduopunctata*	22-spot Ladybird		X					X	
Coleoptera: Coccinellidae	*Propylea quattuordecimpunctata*	14-spot Ladybird		X						
Coleoptera: Mordellidae	*Mordellochroa abdominalis*			X						
Coleoptera: Oedemeridae	*Oedemera nobilis*	Swollen-thighed Beetle		X	X		X			
Coleoptera: Oedemeridae	*Oedemera lurida*			X	X		X	X	X	
Coleoptera: Scraptiidae	*Anaspis regimbarti*			X						
Coleoptera: Chrysomelidae	*Bruchidius varius*			X						
Coleoptera: Chrysomelidae	*Chrysolina hyperici*			X						
Coleoptera: Chrysomelidae	*Longitarsus rutilus*		**Nationally Scarce a**	X						
Coleoptera: Chrysomelidae	*Altica oleracea*			X					X	
Coleoptera: Chrysomelidae	*Chaetocnema hortensis*					X				
Coleoptera: Chrysomelidae	*Sphaeroderma testaceum*			X						
Coleoptera: Chrysomelidae	*Cryptocephalus moraei*			X						X
Coleoptera: Apionidae	*Omphalapion hookerorum*			X						X
Coleoptera: Apionidae	*Protapion fulvipes*	White Clover Seed Weevil							X	X
Coleoptera: Apionidae	*Protapion trifolii*			X						
Coleoptera: Apionidae	*Stenopterapion tenue*									X
Coleoptera: Apionidae	*Ischnopterapion loti*								X	
Coleoptera: Apionidae	*Oxystoma craccae*			X					X	
Coleoptera: Curculionidae	*Sitona humeralis*						X			
Coleoptera: Curculionidae	*Sitona lineatus*			X						
Coleoptera: Curculionidae	*Hypera postica*	Clover Leaf Weevil								X
Coleoptera: Curculionidae	*Hypera zoilus*								X	
Coleoptera: Curculionidae	*Cionus scrophulariae*	Figwort Weevil		X						
Coleoptera: Curculionidae	*Dorytomus dejeani*			X						
Coleoptera: Curculionidae	*Rhinoncus pericarpius*					X				
Coleoptera: Curculionidae	*Ceutorhynchus assimilis*	Cabbage Gall Weevil		X						
Coleoptera: Curculionidae	*Anthonomus rubi*	Strawberry Blossom Weevil		X						
Coleoptera: Curculionidae	*Tychius picirostris*			X					X	X
Coleoptera: Curculionidae	*Gymnetron pascuorum*			X						X
Diptera: Tipulidae	*Nephrotoma flavescens*					X				
Diptera: Tipulidae	*Nephrotoma scurra*					X				

Diptera: Tipulidae	*Tipula vernalis*			X						
Diptera: Tipulidae	*Tipula oleracea*			X						
Diptera: Limoniidae	*Dicranomyia modesta*					X				
Diptera: Stratiomyidae	*Chloromyia formosa*			X	X			X		
Diptera: Empididae	*Empis caudatula*			X						
Diptera: Dolichopodidae	*Chrysotus gramineus*			X						
Diptera: Dolichopodidae	*Chrysotus suavis*		**None (Nationally Scarce)**	X					X	
Diptera: Dolichopodidae	*Dolichopus griseipennis*			X						
Diptera: Dolichopodidae	*Dolichopus trivialis*			X						
Diptera: Dolichopodidae	*Dolichopus ungulatus*					X				
Diptera: Dolichopodidae	*Sympycnus desoutteri*			X						
Diptera: Syrphidae	*Melanostoma mellinum*	a hoverfly		X						
Diptera: Syrphidae	*Platycheirus clypeatus*	a hoverfly		X						
Diptera: Syrphidae	*Platycheirus immarginatus*	a hoverfly	**Nationally Scarce**	X						
Diptera: Syrphidae	*Dasysyrphus tricinctus*	a hoverfly		X						
Diptera: Syrphidae	*Sphaerophoria scripta*	a hoverfly		X						
Diptera: Syrphidae	*Cheilosia impressa*	a hoverfly		X						
Diptera: Syrphidae	*Cheilosia variabilis*	a hoverfly		X						
Diptera: Syrphidae	*Neoascia podagrica*	a hoverfly		X						
Diptera: Syrphidae	*Pipizella viduata*	a hoverfly		X						
Diptera: Syrphidae	*Syritta pipiens*	a hoverfly		X	X					
Diptera: Pipunculidae	*Eudorylas obliquus*			X						
Diptera: Micropezidae	*Micropeza corrigiolata*			X						
Diptera: Conopidae	*Sicus ferrugineus*			X	X					
Diptera: Platystomatidae	*Rivellia syngenesiae*			X						
Diptera: Tephritidae	*Urophora cardui*			X						
Diptera: Tephritidae	*Tephritis matricariae*		**(RDBK)**	X						
Diptera: Lauxaniidae	*Minettia tabidiventris*			X						
Diptera: Lauxaniidae	*Minettia fasciata*			X						X
Diptera: Lauxaniidae	*Sapromyza quadripunctata*			X						
Diptera: Chamaemyiidae	*Chamaemyia herbarum*			X						X
Diptera: Chamaemyiidae	*Chamaemyia polystigma*			X						
Diptera: Sciomyzidae	*Pherbellia cinerella*			X						

Diptera: Sciomyzidae	*Pherbellia griseola*		**Nationally Scarce**							X
Diptera: Sciomyzidae	*Hydromya dorsalis*			X						
Diptera: Sciomyzidae	*Limnia unguicornis*			X						
Diptera: Sciomyzidae	*Tetanocera punctifrons*		**Nationally Scarce**	X						X
Diptera: Sepsidae	*Sepsis cynipsea*			X						
Diptera: Agromyzidae	*Cerodontha denticornis*			X						
Diptera: Agromyzidae	*Cerodontha luctuosa*			X						
Diptera: Opomyzidae	*Opomyza germinationis*			X						
Diptera: Chloropidae	*Chlorops pumilionis*			X						
Diptera: Chloropidae	*Thaumatomyia glabra*			X						
Diptera: Chloropidae	*Thaumatomyia hallandica*			X					X	X
Diptera: Chloropidae	*Thaumatomyia notata*									X
Diptera: Chloropidae	*Dicraeus vagans*			X						
Diptera: Ephydridae	*Scatella stagnalis*			X						
Diptera: Anthomyiidae	*Delia florilega*			X						
Diptera: Anthomyiidae	*Delia platura*					X				
Diptera: Fanniidae	*Fannia armata*							X		
Diptera: Muscidae	*Coenosia atra*		**Nationally Scarce**	X						
Diptera: Muscidae	*Schoenomyza litorella*			X		X				X
Diptera: Muscidae	*Helina reversio*						X			
Diptera: Calliphoridae	*Calliphora vicina*					X	X			
Diptera: Sarcophagidae	*Senotainia conica*					X				
Diptera: Sarcophagidae	*Nyctia halterata*			X						
Diptera: Sarcophagidae	*Sarcophaga nigriventris*			X						
Diptera: Sarcophagidae	*Sarcophaga subvicina*						X			
Diptera: Tachinidae	*Meigenia mutabilis*			X						
Hymenoptera: Formicidae	*Lasius niger sens. str.*	an ant		X		X	X	X		X
Hymenoptera: Formicidae	*Myrmica scabrinodis*	an ant				X				
Hymenoptera: Pompilidae	*Dipogon variegatus*	a spider-hunter wasp					X			
Hymenoptera: Eumenidae	*Ancistrocerus oviventris*	a potter wasp		X						
Hymenoptera: Eumenidae	*Symmorphus gracilis*	a mason wasp		X						
Hymenoptera: Crabronidae	*Crossocerus nigritus*	a digger wasp		X						
Hymenoptera: Crabronidae	*Oxybelus uniglumis*	Common Spiny Digger Wasp			X	X				

Hymenoptera: Crabronidae	*Pemphredon inornata*	a digger wasp		X						
Hymenoptera: Crabronidae	*Psenulus pallipes*	Pale Footed Black Wasp		X						
Hymenoptera: Apidae	*Apis mellifera*	Honey Bee		X	X					
Hymenoptera: Apidae	*Bombus campestris*	a bumblebee		X						
Hymenoptera: Apidae	*Bombus humilis*	Brown-banded Carder Bee	**BAP S41**		X					
Hymenoptera: Apidae	*Bombus hypnorum*	a bumblebee		X						
Hymenoptera: Apidae	*Bombus jonellus*	Heath Bumble Bee		X						
Hymenoptera: Apidae	*Bombus lapidarius*	Large Red Tailed Bumble Bee		X	X					
Hymenoptera: Apidae	*Bombus pascuorum*	Common Carder Bee		X	X					
Hymenoptera: Apidae	*Bombus pratorum*	Early Bumble Bee		X	X					
Hymenoptera: Apidae	*Bombus terrestris*	Buff-tailed Bumble Bee		X	X					
Hymenoptera: Apidae	*Halictus tumulorum*	a mining bee		X						
Hymenoptera: Apidae	*Hylaeus annularis*	a solitary bee		X						
Hymenoptera: Apidae	*Hylaeus communis*	Common Yellow Face Bee		X						
Hymenoptera: Apidae	*Hylaeus hyalinatus*	a solitary bee		X	X					
Hymenoptera: Apidae	*Hylaeus signatus*	Large Yellow-faced Bee	**Nationally Scarce b**	X	X					
Hymenoptera: Apidae	*Lasioglossum punctatissimum*	a mining bee		X						
Hymenoptera: Apidae	*Osmia caerulescens*	a mason bee		X	X		X			
Hymenoptera: Apidae	*Osmia leaiana*	a mason bee		X						
Hymenoptera: Tenthredininae	*Macrophya annulata*	a sawfly		X						
		total diversity	**242**	122	30	63	41	20	36	51
		all scarce/RDB	**11**	9	1	1	1	0	1	2
		% scarce/RDB	**4.6**	7.4	3.3	1.6	2.4	0	2.8	3.9
		no RDB	**2**	1	0	1	1	0	0	0
		% RDB	**0.8**	0.8	0	1.6	2.4	0	0	0