PERMIT APPLICATION FOR TREATMENT OF WASTE TO PRODUCE SOIL, SOIL SUBSTITUTES AND AGGREGATES

PAR Contractors Ltd Ltd

Site address :

Ynys Uchaf

Brynteg

Anglesey

LL78 8JZ

Tier 2 bespoke Locational Assessment

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Introduction

This risk assessment is an addendum to the main standard rule permit submission and is submitted as the location only requires assessment.

This risk assessment will assess the specific risk posed by the proposed facility to the Cors Goch SSS/ NNR and the Anglesey and Llyn Fens SPA and Ramsar sitesI. This site requires an assessment under the Countryside Rights of Way Act and the Habitats Directive as they are 10 metres of the site.

Assessment Procedure

An assessment of the risks posed by the treatment of waste to produce soil, soil substitutes and aggregates must assess the relevant hazards posed by the proposed site to the relevant receptor. In other words the inherent potential of a substance or physical situation to cause harm, the nature of the potential receptor which could be effected by the hazard, pathways between the hazard and the receptor and the risk those hazards pose to the receptor.

As a result of this assessment mitigating factors can be built into the design and operation of the proposed facility, if they are needed, to reduce the risk to the receptors. This can be done in a number of ways such as removing or interrupting the pathway between hazard and receptor or reducing the hazard at source.

Hazard Identification

Potential hazards to the ecological features of the receptor site can be assessed in terms of :

- Toxic contamination from
  - toxic leachate
  - landfill gas
  - toxic wastes
  - contaminated dusts

• Nutrient enrichment from	nutrient rich leachate nutrient rich wastes
• Habitat loss from	land encroachment explosive wastes landfill gas monitoring boreholes
• Siltation	mud suspended solids
• Smothering	dust/particles from vehicles dust from periphery dust from wastes
• Disturbance	visual human presence noise/vibration
• Predation/displacement	other birds attracted to the site gulls/corvidores rodents

Receptor

The potential ecological receptor near to the site which is relevant for this assessment is the:

Site of Special Scientific Interest (SSSI) under (CRoW) within 2Km

Cors Goch SSSI/ NNR and the Anglesey and Llyn Fens SPA/SAC, which are approximately 10m to the North West and South West of the proposed site.

See overleaf :

There are 3 areas close to the proposed site detailed in the Anglesey and Llyn Fens Management Plan Management Plan, which also covers the SSSI (see appendix 1). These areas are listed below with the Key habitat and Key Species identified in the plan for each area.

Management Unit/ Map 3 reference	Key Habitat	Key Species
2/ cg2	North Atlantic Wet Heaths. Semi- Natural Woodland	Gentiana pneumonanthe
18/ cg18	Non Listed	Non Listed
19/ cg19	Non Listed	Non Listed
Annex II species		Marsh Fritillary Greater Crested Newt Otter

Potential Hazards

Toxic contamination and Nutrient Enrichment

The proposed facility is a non hazardous, inert and non contaminated soils treatment and transfer site and there will, therefore, be no contaminated dusts or toxic wastes accepted at the site which could affect the Habitats Sites. The impact of non hazardous dust is discussed in a later section relating to smothering risk.

Landfill gas will not be generated by the facility and therefore there is no risk to the Habitats Sites.

The surface of the site is hardstanding and so rainwater will tend to infiltrate the surface of the site and permeate into the soil layers. Surface runoff would only happen during an extreme rainfall event, where water carrying supended

solids could flow onto the hard but permeable track by the depot. The run off from the site would be of a non hazardous nature although of course could have effects on certain receptors as it could contain non hazardous suspended solids which could have a siltation effect or may contain top soils which could have an effect on the nutrient levels. In the knowledge that run off of some nature may be generated at the site a consideration of its potential pathway is required to assess the risk to the SSSI receptor.

The operational area is protected from the water feature by a 10m stand off with a bund to prevent direct discharges taking place. This will form a break in the pathway for discharges o feature 18to the NE of the site. The ground under the processing area is on the Clwyd limestone group and consists of limestones, sandstone and conglomerate which are likely to be permeable and will permit the flow of water through the base of the site. Unless there was considerable flow due to high rainfall. In this event the impact of any suspended solids on the receptor Habitats Sites would be negligible due to dilution from the increased flow of the stream. Any potential for nutrient enrichment from top soil is considered to be insignificant. Therefore, it is considered that, there will be no significant risk to the Habitats Sites from toxic contamination or nutrient enrichment.

Habitat Loss

Habitats loss could result from the physical take up of habitat or buffer zone. There will be no encroachment resulting from the facility. Other forms of encroachment could be via the installation of boreholes etc on sensitive sites. However, no such encroachment will occur.

Siltation

Siltation could potentially result from suspended solids being discharged from the site to the receptor sites or from mud being washed off site surfaces and

discharging into the surface water. As discussed above there should be no significant risk to the Habitats Site from siltation from the site.

Water (other than for dust suppression) is not used as part of the process.

Smothering

Smothering could potentially result from dust and particulates being generated at the site and being deposited on the receptor site via air emissions. These emissions could be due to vehicle movements both within and outside the site boundary and from airborne particulates from treatment activities on the site. Due to a combination of dust suppression measures on site, such a damping down, reduced working in very windy conditions, careful site operations to reduce the dropping distance of loads, placement of plant etc (within the Environmental Management System) and the distance of the SSSI from the facility (minimum 335m) it can be concluded that there is no significant risk posed to the receptor site.

Disturbance

Due to the distance from the site to the receptor site (minimum 335m) and the fact that the A55 trunk road lies between the site and the receptor site, there will be no visual impact on the receptor site or other disturbance such as from noise. Human presence from the site will again not affect the receptor site due to distance.

Predation/Displacement

Pest including rodents and birds are not likely to be attracted to the facility due to the nature of the waste types accepted but if rodents are evident there are inspection and control measures in place to reduce the hazard at source. Due to the control measures, the nature of the waste facility and the distance from

the receptor site to the facility predation is not considered to be a significant hazard.

Protection of Greater Crested Newts

The site has been identified as being within 250m of the presence of Greater Crested Newts, where it is linked to the breeding ponds of newts by good habitat as there are ponds nearby on the NNR which will possibly have newt populations.

Whilst the site will not be attractive to Greater Crested Newts for breeding or foraging measures shall be implemented to prevent newts from the adjacent watercourse by means of newt fencing installed on the bunds to the North East, North West and Western boundaries of the site.

Conclusions

It can be concluded that, provided the site is operated in accordance with the Environmental Management System, the proposed facility will have no significant impact on the ecological receptor site discussed in this risk assessment.

Appendix 1 SSSI Citation

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 02 February 1998 / updated 12 May 2005

3. Country:

UK (Wales)

4. Name of the Ramsar site:

Corsydd Môn a Llyn/ Anglesey and Llyn Fens

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

a) hard copy (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □

b) digital (electronic) format (optional): Yes

6. Geographical coordinates (latitude/longitude)**:**

53 18 45 N 04 17 44 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Bangor

The site comprises a suite of base-rich fens located on the Isle of Anglesey and the Lleyn Peninsula in north-west Wales.

Administrative region: Gwynedd; Ynys Môn/ Isle of Anglesey

8. Elevation (average and/or max. & min.) (metres)**:**

Min. 16
Max. 79
Mean 39

9. Area (hectares)**:** 625.53 (2005 calculation, no boundary change)

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

An internationally important suite of base-rich fens comprised of six component sites, supporting a range of associated floral and faunal rarities. The six wetlands occupy valley heads and former lake basins which have mostly infilled with marl and peat deposits, with open water persisting at two of the sites. Calcareous springs from limestone and calcareous drift aquifers irrigate the fens and result in a distinctive vegetation. These fens are notable as the best sites in Wales for stoneworts.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 3

Secretariat comment: The RIS provides information requiring the application of Criterion 2. This needs to be included in the next update.

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

The site supports a suite of base-rich, calcareous fens which is a rare habitat type within the United Kingdom's biogeographical zone.

Habitats Directive Annex I features present on the SAC include:

H3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.

H4010 Northern Atlantic wet heaths with *Erica tetralix*

H6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*

H7230 Alkaline fens

S1013 *Vertigo geyeri*

S1044 *Coenagrion mercuriale*

S1065 *Euphydryas* (*Eurodryas, Hypodryas*) *aurinia*

Ramsar criterion 3

The site supports a diverse flora and fauna with associated rare species and is of special value for maintaining the genetic and ecological diversity of the region.

See Sections 19/20 for details of noteworthy species

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	basic, sand, clay, peat, igneous, limestone/chalk, maerl, gravel, boulder
Geomorphology and landscape	lowland, floodplain, basins
Nutrient status	mesotrophic, oligotrophic
pH	alkaline, circumneutral
Salinity	fresh
Soil	mainly organic
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Valley, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/valley.html) Max. daily temperature: 13.1° C Min. daily temperature: 7.5° C Days of air frost: 18.3 Rainfall: 827.9 mm Hrs. of sunshine: 1621.4

General description of the Physical Features:

No information available

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

No information available

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Flood water storage / desynchronisation of flood peaks, Maintenance of water quality (removal of nutrients)

17. Wetland types

Inland wetland

Code	Name	% Area
O	Freshwater lakes: permanent	0.2
Tp	Freshwater marshes / pools: permanent	0.1
Ts	Freshwater marshes / pools: seasonal / intermittent	0.1
U	Peatlands (including peat bogs swamps, fens)	99.2
Y	Freshwater springs	0.01
Other	Other	0.4

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

All six wetlands within this site occupy valley heads and former lake basins which have mostly infilled with marl and peat deposits, although in the cases of Cors Goch and Cors Erddreiniog open water lakes persist. Calcareous springs, from limestone aquifers or shelly glacial drift, irrigate the fens and lead to a distinctive vegetation of *Schoenus nigricans-Juncus subnodulosus* hummocks which is rich in plants such as *Dactylorhiza traunsteineri*, *Ophrys insectifera*, *Pinguicula vulgaris*, the long-stalked yellow-sedge *Carex viridula* ssp. *brachyrrhyncha*, and the moss *Scorpidium scorpioides*.

In lower-lying areas, swamp vegetation dominated by stands of *Cladium mariscus, Carex elata* and *Carex lasiocarpa* is characteristic. These fens are notable as the best Welsh sites for stoneworts such as *Nitella tenuissima*.

Plant community types are prefixed by the National Vegetation Classification (NVC) code (e.g. S9).

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

Dactylorhiza traunsteineri
Eriophorum gracile
Lower Plants.
Nitella tenuissima.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Species Information

Species occurring at levels of international importance.

Invertebrates.

Vertigo geyeri (Habitats Directive Annex II (S1013))
Vertigo moulinsiana (Annex II (Habitats Directive (S1016); RDB3)
Coenagrion mercuriale (Habitats Directive Annex II (S1044))
Euphydryas aurinia (Habitats Directive Annex II (S1065))

Nationally important species occurring on the site.

Invertebrates.

Mammals.

Lutra lutra (Habitats Directive Annex II (S1355))

Invertebrates.
Chlaenius tristis (RDB1)
Asilus crabroniformis (Notable)
Stratiomys chamaeleon, Acrometopia wahlbergi, Hirudo medicinalis (Habitats Directive Annex V (S1034).

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Archaeological/historical site
Environmental education/ interpretation
Livestock grazing
Scientific research
Sport hunting

22. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	
Local authority, municipality etc.	+	+
Private	+	+
Public/communal	+	

23. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	+
Commercial forestry		+
Cutting of vegetation (small-scale/subsistence)	+	+
Arable agriculture (unspecified)	+	+
Livestock watering hole/pond	+	+
Grazing (unspecified)	+	+
Rough or shifting grazing	+	+
Permanent pastoral agriculture	+	+
Hay meadows	+	+
Hunting: recreational/sport	+	+
Industry		+
Flood control	+	+
Transport route		+

24. Factors adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Vegetation succession	1		+	+	
Drainage/land-claim: (unspecified)	1		+		+
Eutrophication	1		+	+	+
Pollution – agricultural fertilisers	1		+	+	+

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Is the site subject to adverse ecological change? NO

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
National Nature Reserve (NNR)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Special Area of Conservation (SAC)	+	
Management plan in preparation	+	

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Flora.
Monitoring of vegetational changes.
Palaeoecological research to determine trends in vegetation development over time.
Monitoring of the population size and distribution of vulnerable species.

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Four of the sites are used by local schools and community groups for environmental education. There are boardwalks and interpretive boards at Cors Goch NNR.

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.
The network of footpaths is used for rambling and horse riding which takes place all year, but mainly during the summer.

No other facilities are provided.

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Countryside Division, Welsh Assembly Government, Cathays Park, Cardiff, CF1 3NQ

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Safeguard Officer, International Designations, Countryside Council for Wales, Maes-y-Ffynnon, Penrhosgarnedd, Bangor, Gwynedd, LL57 2DW

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **13** above), list full reference citation for the scheme.

Site-relevant references

Gibbons, B (1999) Reserve focus – Cors Erddreiniog and other Anglesey fens. *British Wildlife*, **10**(5), 334-337

Gilman, K & Newson, MD (1982) The Anglesey Wetlands Study. (Final report) (Contractor: Institute of Hydrology, Wallingford) *NCC CSD Report*, No. **430**

Jones, PS, Stevens, DP, Blackstock, TH, Burrows, CR & Howe, EA (eds.) (2003) *Priority habitats of Wales: a technical guide*. Countryside Council for Wales, Bangor

Killeen, IJ (2000) Status and distribution of Des Moulin's whorl snail *Vertigo moulinsiana* on Cors Geirch SSSI. *CCW Contract Science Report*, No. **373**

McLeod, CR, Yeo, M, Brown, AE, Burn, AJ, Hopkins, JJ & Way, SF (eds.) (2004) *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Joint Nature Conservation Committee, Peterborough. www.jncc.gov.uk/SACselection

Meade, R & Blackstock, TH (1988) The impact of drainage on the distribution of rich-fen plant communities in two Anglesey basins. *Wetlands*, **8**, 159-177

Ratcliffe, DA (ed.) (1977) *A Nature Conservation Review. The selection of biological sites of national importance to nature conservation in Britain*. Cambridge University Press (for the Natural Environment Research Council and the Nature Conservancy Council), Cambridge (2 vols.)

Shirt, DB (ed.) (1987) *British Red Data Books: 2. Insects*. Nature Conservancy Council, Peterborough

Stewart, NF (2004) *Important stonewort areas. An assessment of the best areas for stoneworts in the United Kingdom*. Plantlife International, Salisbury

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RAMSAR CONVENTION ON WETLANDS OF INTERNATIONAL IMPORTANCE

CORSYDD MÔN A LLYN
ANGLESEY AND LLYN FENS

(Isle of Anglesey, Gwynedd)

Cors Goch, Cors Erddreiniog, Cors Bodeilio, and Cors y Farl on the Isle of Anglesey and Cors Edern and Cors Geirch on the Llyn Peninsula (Gwynedd) comprise an internationally important suite of base-rich fens, a rare wetland habitat type which has undergone large scale decline in the British Isles. While the base-rich fens of the Broadland district of East Anglia constitute their closest biological counterpart on the British mainland, the oceanic climate of north-west Wales results in the presence of a unique assemblage of northern and southern floristic elements, The six component sites share similar physical, chemical and vegetational features but differ in their associated rarities of flora and fauna. The composite site qualifies under Ramsar criterion 1 d as an example of a type of wetland which is rare and unusual in the biogeographic region and under criterion 2b as it is of special value for maintaining the genetic and ecological diversity of the region because of the quality and peculiarities of its flora and fauna"

All six wetlands occupy former lake basins which have mostly infilled with marl and peat deposits, although in the cases of Cors Goch and Cors Erddreiniog open water lakes persist. Calcareous springs from limestone aquifers (or apparently in the case of Cors Geirch and Cors Edern from shelly glacial drift) irrigate the fens and lead to a distinctive vegetation of black bog rush - blunt flowered rush *Schoenus nigricans* - *Juncus subnodulosus* hummocks which is rich in plants such as narrow leaved marsh orchid *Dactylorhiza traunsteineri,* fly orchid *Ophrys insectifera,* common butterwort *Pinguicula vulgaris,* long stalked yellow sedge *Carex lepidocarpa* and the moss *Scorpidium scorpioides.* In lower lying areas, swamp vegetation dominated by stands of great fen sedge *Cladium mariscus,* tufted sedge *Carex elata* and slender sedge *Carex lasiocarpa is* characteristic. These fens are notable as the best Welsh sites for stoneworts (large freshwater algae which precipitate lime deposits and contribute to the deposition of marl) such as dwarf stonewort *Nitella tenuissima.*

The fauna of these fens reflects the very specialised nature of the habitat and includes rarities such as the marsh fritillary *Eurodryas aurina,* southern damselfly *Coenagrion mercuriale,* the soldierfly *Stratiomys chamaeleon,* the fly *Acrometopia wahlbergi,* medicinal leech *Hirudo medicinalis* and Geyer's whorl snail *Vertigo geyeri.* These sites are also used by water voles *Arvico/a terrestris,* otters *Lutra lutra,* marsh harriers *Circus aeruginosus,* hen harriers C. *cyaneus,* skylark *Alauda arvensis* and lapwing *Vanellus vanellus,*

These fens have a long history of low intensity human use, notably extensive grazing, occasional burning and manual peat cutting, which has maintained and even enhanced the biological interest. In recent years many fens have deteriorated either as a result of

intensive drainage and eutrophication (nutrient enrichment) or through the abandonment of traditional management. Many of the remaining sites are owned and managed by conservation agencies, including Cors Erddreiniog National Nature Reserve (NNR), Cors Bodeilio NNR, Cors Goch NNR (owned and managed by the North Wales Wildlife Trust) and Cor Geirch NNR.

Ramsar citation
Countryside Council for Wales

December 1997

CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

ANGLESEY **CORS GOCH**

Date of Notification: 1957, 1983, 1990

National Grid Reference: SH497813

O.S. Maps: 1:50000 Sheet number: 114
1:25000 Sheet number: SH48, SH58

Site Area: 54.2 ha

Description:

Cors Goch is a nationally important valley mire developed in a hollow in Carboniferous Limestone. The geology is complex and interstratified with the limestone are beds of a coarse pebbly sandstone. In close proximity are found acidic heaths with heather *Calluna vulgaris* and pale dog-violet *Viola lactea*, limestone grassland with green-winged orchid *Orchis morio* and base rich fen. The fen is almost divided by a rock promontory into an east and a west basin. The east basin is very wet with an excellent association of brown mosses, black bog-rush *Schoenus nigricans* with sedges *Carex spp* and with communities dominated by great fen-sedge *Cladium mariscus*, common reed *Phragmites australis* and blunt-flowered rush *Juncus subnodulosus*. Higher areas in the fen have acidic vegetation with bog mosses *Sphagnum papillosum* and *S. plumulosum*. Around the margin bog-myrtle *Myrica gale* forms a zone with black bog-rush *Schoenus nigricans*. The western basin is somewhat drier, but contains similar fen communities, and a lake Llyn Cadarn, which has an interesting hydrosere with bulrush *Typha latifolia* common club-rush *Schoenoplectus lacustris* and water-lilies *Nymphaea alba* and *Nuphar lutea*. The fen has a rich insect fauna, the *Lepidoptera* and *Odonata* being well represented.