



Cog Moors WwTW South Sludge Strategy

Preliminary Ecological Appraisal

October 2016

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Executive summary

Dŵr Cymru Welsh Water Ltd (DCWW) has appointed Mott MacDonald Bentley (MMB) to design and build an advanced digestion facility at Cog Moors Wastewater Treatment Works (WwTW). MMB has undertaken a Preliminary Ecological Appraisal (PEA) of the site. Cog Moors WwTW is located in the Vale of Glamorgan approximately 1.5km to the south of Dinas Powys at Ordnance Survey Grid Reference: ST159695.

The purpose of this PEA report is to provide an initial assessment of the ecological importance of the habitats in the areas relevant to the proposed works and the potential for these areas to support protected ecological features and species. This report presents the results of the assessment.

The western section of the site is located within a Statutory Designated Site (SSSI), Cog Moors Site of Special Scientific Interest. No works are scheduled within the area designated as part of the SSSI. No designating features for the SSSI were observed within the current WwTW site boundary. It is considered that the current SSSI boundary is out of date.

The proposed excess soil storage area is located within Cog Moors Sites of Importance for Nature Conservation (SINC) a Non-Statutory Designated Site. A dedicated National Vegetation Classification (NVC) grassland survey is required in order to assess the potential impacts fully and to determine avoidance, mitigation and enhancement requirements if this area is to be used to store soil. Further consultation with The Vale of Glamorgan's county ecologist is recommended for any proposed works within the SINC.

Protected species records indicate that birds, otter, bats, great crested newts, invertebrates and invasive species are present within 2km.

The habitats within the site boundary of the WwTW are considered to be of moderate ecological value with habitat types that vary between woodland and hardstanding and managed habitats. The woodland, hedgerow and tall ruderal habitats are considered suitable to support breeding birds, badgers, dormice, bats, reptiles and great crested newts. Further surveys are therefore recommended to confirm the presence / absence of protected species are undertaken on site in order to assess potential impacts on this species and to determine mitigation requirements associated with the proposed development of the site.

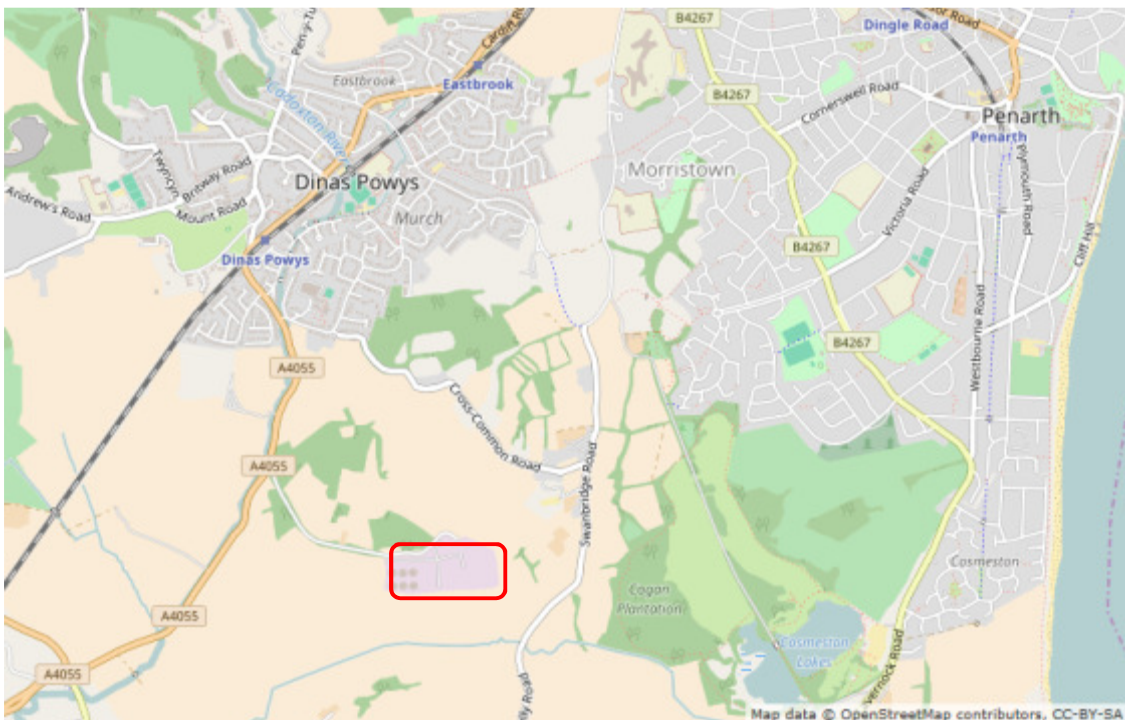
1 Introduction

1.1 Background

Dŵr Cymru Welsh Water Ltd (DCWW) has appointed Mott MacDonald Bentley (MMB) to design and build an advanced digestion facility at Cog Moors Wastewater Treatment Works (WwTW). MMB have undertaken a Preliminary Ecological Appraisal (PEA) of the site to understand any ecological constraints that may be present.

Cog Moors WwTW is located in the Vale of Glamorgan approximately 1.5km to the south of Dinas Powys at Ordnance Survey Grid Reference: ST159695 (Figure 1).

Figure 1: Site Location Plan



Source: OpenStreetMap

1.2 Proposed Works

The proposed works involve the construction of an advanced digestion facility. The preferred option for the works is shown in Appendix A, Figure 1.

1.3 Scope of the Report

The purpose of this report is to provide an initial assessment of the ecological importance of the habitats present within and immediately adjacent to the WwTW and their potential to support protected or notable species.

The scope of this study is to:

- Carry out a phase 1 habitat survey (Joint Nature Conservation Committee (JNCC), 2010) to provide a description of the existing broad habitat types within the WwTW and to establish the presence or potential presence of any protected or notable species. The results of these surveys are presented in drawing form (Appendix A, Figure 2) and Target Notes (Appendix B);
- Undertake a desk-top study to identify any existing information regarding protected or notable species and sites with a nature conservation designation within the zone of influence of the WwTW;
- Produce a report detailing any ecological constraints to the proposed development in terms of designated sites, habitats and/or protected and notable species;
- Provide recommendations for further ecological survey work, (if considered necessary) and to produce an ecological baseline for the WwTW;
- Conduct an ecological risk assessment to identify the potentially significant ecological constraints to the delivery of the project; and
- Identify any mitigation measures that may be required to offset potential development impacts.

1.4 Zone of Influence

The current guidance on ecological impact assessments (Chartered Institute of Ecology and Environmental Management (CIEEM), 2016) recommends that all ecological features that occur within a 'Zone of Influence' (Zoi) for a proposed development are investigated.

The Zoi includes:

- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The Zoi is variable depending on the nature of the construction activities and the ecological receptors affected. For this assessment the following zones have been defined:

Table 1: Zone of Influence used for this assessment

Ecological features	Zone of Influence
Designated Sites	2km buffer around site boundary
Designated Sites for bats	10km buffer around the site boundary
Protected species records	2km from site boundary
Designated Sites	2km buffer around site boundary

1.5 Legislative Context and Policy Framework

The key legislation relating to ecology and the environment is the Wildlife and Countryside Act 1981 as amended (WCA) which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain. The WCA is complemented by the Conservation (Natural Habitats, etc.) Regulations 1994 (as amended), which implements Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive). The Regulations provide for the designation and protection of

'European sites', and the protection of 'European protected species'. The species and habitats listed by these measures are legally protected to varying degrees through the WCA. Together, the WCA and The Conservation of Habitats and Species Regulations 2010 form the precedent for species and habitat protection in England and Wales.

The Natural Environment and Rural Communities (NERC) Act 2006 requires public bodies, including local authorities, 'to have regard to the conservation of biodiversity in England & Wales' when carrying out their normal functions. Also under Section 42 of this Act a list of species and habitats of 'principal importance to biodiversity within Wales (known as priority species and habitats) was drawn up which acts as an aid to guide public bodies in implementing their duty.

At national level, Chapter 5 of Planning Policy Wales (which relates to conserving and enhancing the natural environment) requires Local Authorities to take measures to:

- Promote the conservation of landscape and biodiversity, in particular the conservation of native wildlife and habitats;
- Ensure that action in Wales contributes to meeting international responsibilities and obligations for the natural environment;
- Ensure that statutorily designated sites are properly protected and managed;
- Safeguard protected species; and
- Promote the functions and benefits of soils, and in particular their function as a carbon store.

Developers must ensure that they comply with the above legislation by fully assessing the potential impacts on protected species and habitats from the proposed development. Where planning permission is required, this assessment must be finalised prior to and included with the submission of the planning application. The Planning Authority can then ensure that the necessary protected species and habitats surveys have been completed.

2 Methodology

2.1 Desk Study

A desk study was undertaken, as recommended in the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Preliminary Ecological Appraisal' (2013), to determine the presence of any designated nature conservation sites within the Zol of the WwTW. To ensure the validity of the data, only records collected in the last 10 years and within 2km of the WwTW were requested from South East Wales Biodiversity Records Centre (SEWBRc). This data has been further curtailed to the nearest and most recent records for each species recorded.

The desk study also involved consulting the following sources:

- Multi Agency Geographical Information for the Countryside (MAGIC) website;
- Natural Resources Wales (NRW);
- Biodiversity Action Reporting System (BARS);
- Joint Nature Conservation Committee (JNCC);
- Vale of Glamorgan Local Biodiversity Action Plan (LBAP); and
- Vale of Glamorgan Local Development Plan 2011 – 2026.

2.2 Site Visit

A site visit was undertaken by an experienced ecologist on the 7th October 2016. All habitats within the site were identified and mapped in compliance with the 'Handbook for Phase 1 Habitat Survey: a technique for environmental audit' (JNCC, 2010). Dominant plant species were noted, as were any protected, uncommon or invasive species listed on Schedule 9 of the WCA. An assessment was also undertaken of the likely presence or absence of protected and notable species within the Zol of the proposed works. This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations. The methodologies and assessment criteria used were based on current published guidance.

2.3 Limitations and Expectations

Biological records obtained from third parties presented in the desk study do not represent a full and complete species list for the area. They are mostly given by individuals on an ad-hoc basis, often meaning there are areas of deficiency in the data.

Ecological surveys are limited to factors which affect the presence of plants and animals, such as time of year, migration patterns and behaviour. With a single survey visit it is possible that certain species may have been overlooked or under-recorded during the assessment as optimal survey periods vary from species to species. This PEA therefore cannot be considered to provide a wholly comprehensive account of the ecological interest of the site and it should be noted that this report does not constitute an Ecological Impact Assessment (EclA). The survey does however provide a "snapshot" of the ecological interest present on the day of the survey visit.

The field to the south and east of the main site is proposed to be part of the storage area for any soil removal and proposed works. No access was granted within this section (Marked as TN1

and hashed out area on the Phase 1 Habitat Map) due to a locked fence. If this area is to be included as part of the works, further surveys are required to assess any potential constraints within this area.

3 Results

3.1 Desk Study

The results of the desk study are presented below.

3.2 Statutory Designated Sites

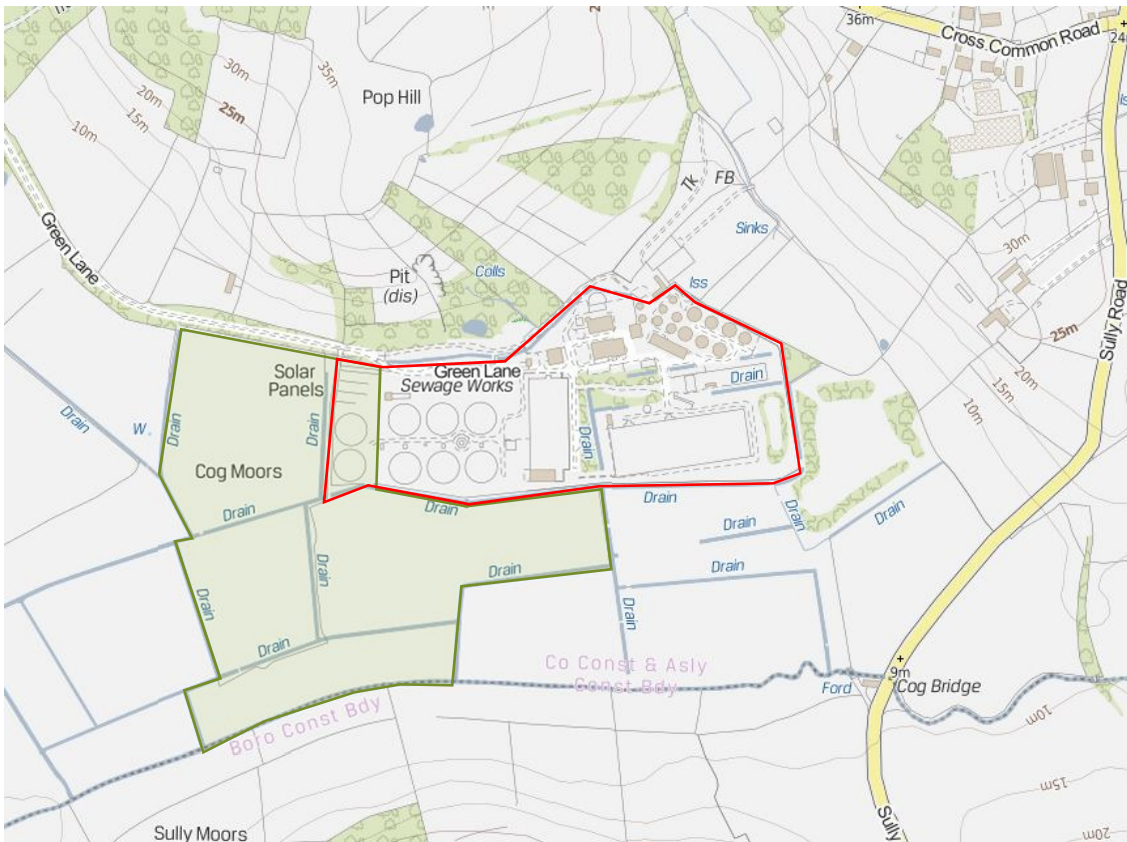
There are two statutory designated sites within 2km of the site. Cog Moors Site of Special Scientific Interest (SSSI) is located within the current site boundary of the WwTW. No Statutory Designated Sites for bats are located within 10km of the site. Details are provided in Table 2 and Figure 2 below.

Table 2: Statutory Designated Sites

Site and Designation	Details	Distance
Cog Moors (SSSI)	<p>Cog Moors is situated approximately 2km east of Barry and consists of a series of fields adjacent to Sully Brook. The fields are low-lying on flat ground, with gleyed soils over alluvium. They are separated by ditches or deep drains and are generally poorly drained.</p> <p>This site is of special interest for its large continuous area of damp mesotrophic (neutral) semi-natural grassland, which is associated with several stands of tall sedges, and for populations of uncommon plant species.</p>	On site, along the western and southern section of the site.
Llynnoedd Cosmeston / Cosmeston Lakes (SSSI)	<p>Llynnoedd Cosmeston/Cosmeston Lakes is situated 2km south of Penarth. It includes two lakes, created from flooded limestone quarries, which are connected by a narrow channel. These are deep (up to 10m), eutrophic water bodies, which support a range of submerged plants. One of the lakes is of special interest as the only known site in Wales for the presence of starry stonewort (<i>Nitellopsis obtusa</i>). This species usually grows in lakes of between 1m and 6m in depth.</p>	0.8km east

Source: MAGIC

Figure 2: Cog Moors SSSI location (green shading)



Source: Crown Copyright and Database Ordnance Survey 2016

3.3 Non-Statutory Designated Sites

There are 14 non-statutory designated sites within 2km of the site. These comprised of 13 Sites of Nature Conservation (SINC) and one Country Park. One SINC, Cog Moors is located on site where the proposed excess soil is to be stored as part of the works. Details are listed in Table 3 and Figure 3 below.

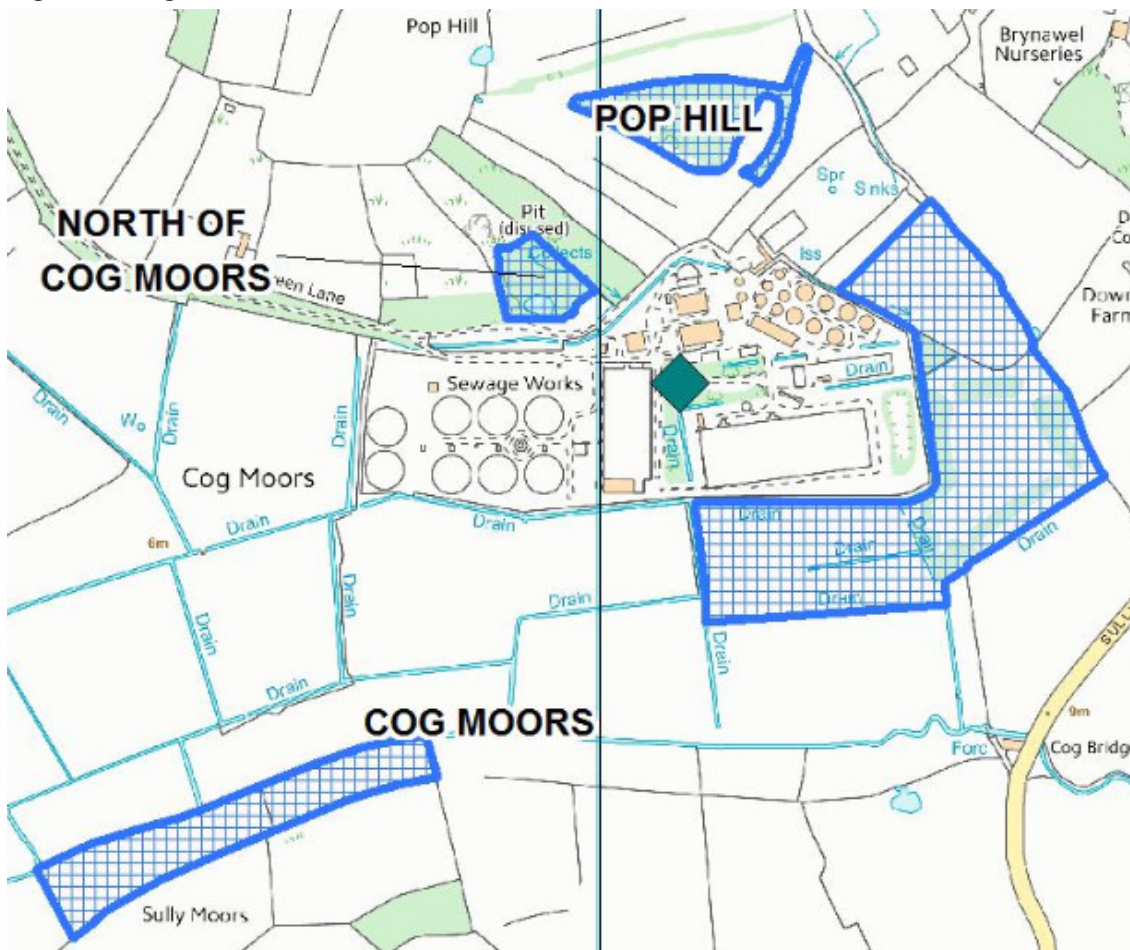
Table 3: Non-Statutory Designated Sites

Site and Designation	Details	Distance
Cog Moors (SINC)	Series of species-rich rush pastures with neutral grassland and associated wet ditches.	The proposed soil storage area is located within this site.
North of Cog Moors (SINC)	Ancient semi-natural woodland.	0.05km north
Pop Hill (SINC)	Predominantly ancient semi-natural broadleaved woodland	0.08km north
Cosmeston Lakes (SINC)	Extensive country park supporting mosaic of habitats including species-rich calcareous and neutral grasslands, scrub, hedgerows, woodland, streams and ponds which all support a wide assemblage of species including many Section 42 species.	0.50km east
Cosmeston Lakes County Park	Unknown designation.	0.50km east
Cogan Pond (SINC)	Large pond supporting reedbed.	0.57km east

Site and Designation	Details	Distance
North of Pop Hill (SINC)	Series of species-rich unimproved neutral grasslands with large anthills.	0.58km north
Shortlands Wood (SINC)	Semi-natural broadleaved woodland, part on an ancient woodland site.	0.67km north
Cross Common (SINC)	Semi-natural broadleaved woodland, part on an ancient woodland site.	0.75km north
Dinas Powys Moors (SINC)	Series of species-rich semi-improved neutral grasslands with ponds.	0.88km west
Pwll Erw-naw (SINC)	Pond which supports good population of great crested newts.	0.89km north west
Pond 11 Biglis Moors (SINC)	Pond which supports good population of great crested newts.	1.21km west
North of North Road (SINC)	Site with large pond supporting large stands of reed bed, scrub and scattered trees.	1.33km south west
Downs Wood (SNIC)	Ancient semi-natural broadleaved woodland.	1.35km north east

Source: Vale of Glamorgan Local Development Plan 2011-2026

Figure 3: Cog Moors SINC Location



Source: SEWBRc Licence number 100018813

3.4 Protected Species Records

The raw site data obtained by SEWBRc is available on request and summarised below.

3.4.1 Birds

There were 60 different priority bird species recorded within 2km of the site. These records included 27 WCA Schedule 1 species.

3.4.2 Mammals

One record of otter (*Lutra lutra*) was identified 1.8km from the site.

Six species of bats were identified within 2km of the site. Species included; lesser horseshoe bat (*Rhinolophus hipposideros*), noctule bat (*Nyctalus noctula*), Leisler's bat (*Nyctalus leisteri*), soprano pipistrelle (*Pipistrellus pygmaeus*), common pipistrelle (*Pipistrellus pipistrellus*), and serotine (*Eptesicus serotinus*).

3.4.3 Reptiles and Amphibians

The search identified 26 records of great crested newt (*Triturus cristatus*) within 2km of the site. The closest record is located approximately 0.9km away from the site. Five ponds were recorded within 250m from the site using both O/S maps and aerial photography. These ponds may be suitable to support great crested newts. No records of reptiles are within 2km of the site.

3.4.4 Invertebrates

Ten notable invertebrates, beaded chestnut (*Agrochola lychnidis*), blood-vein (*Timandra comae*), buff ermine (*Spilosoma lutea*), dingy skipper (*Erynnis tages*), dusky brocade (*Apamea remissa*), galium carpet (*Epirrhoe galiata*), grey dagger (*Acronicta psi*), rustic (*Hoplodrina blanda*), small emerald (*Hemistola chrysoprasaria*) and small phoenix (*Ecliptopera silaceata*) were recorded within 2km of the site.

3.4.5 Invasive Non-Native Species

The search identified records of Japanese knotweed (*Fallopia japonica*) within 2km of the site.

3.5 Site Visit

3.5.1 Amenity Grassland (J1.2)

The ground cover between structures and other habitat comprised of amenity grassland (Figures 4 & 5). Species included Yorkshire fog (*Holcus lanatus*), bent sp. (*Agrostis* sp.), buttercup (*Ranunculus* sp.), white clover (*Trifolium repens*), broad-leaved plantain (*Plantago major*) and bristly ox-tongue (*Helminthotheca echioides*). This grassland was well maintained and recently mowed at the time of the survey.

Figure 4: Amenity grassland



Figure 5: Amenity grassland



3.5.2 Woodland Broad-leaved Plantation (A1.1.2)

The site contained areas of semi-mature broad-leaved plantation woodland (Figures 6 & 7). Species included; hornbeam (*Carpinus betulus*), alder (*Alnus glutinosa*), ash (*Fraxinus excelsior*), silver birch (*Betula pendula*), blackthorn (*Prunus spinosa*), dogwood (*Cornus sanguinea*), elder (*Sambucus nigra*), aspen (*Populus tremula*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), field maple (*Acer campestre*), English oak (*Quercus robur*), Scots pine (*Pinus sylvestris*), rowan (*Sorbus aucuparia*), crack willow (*Salix fragilis*), white willow (*Salix alba*), goat willow (*Salix caprea*), dogrose (*Rosa canina*) and buddleia (*Buddleja davidii*).

The associated ground flora and edge species varied with this habitat on site and contained the follow species; ground ivy (*Glechoma hederacea*), nettle (*Urtica dioica*), rosebay willowherb (*Chamerion angustifolium*), creeping thistle (*Cirsium arvense*), herb Robert (*Geranium robertianum*), teasel (*Dipsacus fullonum*), field mustard (*Sinapis arvensis*), groundsel (*Senecio vulgaris*), cowslip (*Primula veris*), white clover, broad-leaved dock (*Rumex obtusifolius*), ribwort plantain (*Plantago lanceolata*), bent, cocksfoot (*Dactylis glomerata*), wood-sedge (*Carex sylvatica*), common reed (*Phragmites australis*), bind weed (*Convolvulus arvensis*), hog weed (*Heracleum mantegazzianum*), St John's-wort (*Hypericum perforatum*), hairy vetchling (*Lathyrus aphaca*), mallow (*Althaea officinalis*), traveller's joy (*Clematis vitalba*), daisy (*Bellis perennis*), dead nettle (*Lamium purpureum*), hard fern (*Blechnum spicant*), Hart's tongue fern (*Asplenium scolopendrium*) and bramble (*Rumex fruticosus*).

Figure 6: Plantation woodland



Figure 7: Semi-mature trees



3.5.3 Woodland Broad-leaved Semi-natural (A1.1.1)

Remnant areas of semi-natural broad-leaved woodland were present mainly along areas that may have historically comprised of hedgerow or farm boundaries (Figures 8 & 9). Most trees within these areas were mature specimens. Species included English oak, hawthorn, ash, blackthorn, hazel, Scots pine, bramble and willow sp. Ground and edge species were similar to

that described for the plantation woodland above, with some areas containing Himalayan balsam (*Impatiens glandulifera*).

Figure 8: Semi-natural woodland



Figure 9: Semi-natural woodland



3.5.4 Tall Ruderal (C3.1)

Areas of tall ruderal were recorded within the man made bund areas where no plantation trees grew (Figures 10 & 11). Species included teasel, daisy, bristly ox-tongue, rosebay willow herb, prickly sow thistle (*Sonchus asper*), common dandelion (*Taraxacum officinale*), smooth hawksbeard (*Crepis capillaris*), Scotch thistle (*Onopordum acanthium*), Yorkshire fog, bent, herb robert, buttercup (*Ranunculus acris*), ragwort (*Jacobaea vulgaris*), bramble, wood-sedge and great mullein (*Verbascum thapsus*).

Figure 10: Tall ruderal near east boundary



Figure 11: Tall ruderal near south east boundary



3.5.5 Hedge and Trees Native Species-rich (J2.3.1)

Two species-rich hedge and trees run along a small section in the north and the majority of the southern boundary. Both are unmanaged hedges that have overgrown in sections and turned into broad-leaved woodland. Species included; bramble, ash, willow sp, hawthorn, blackthorn, English oak, sessile oak (*Quercus petraea*), goat willow, dogwood, guelder rose (*Viburnum opulus*), elder and field maple.

3.5.6 Dry Ditch (J2.3.6.)

Several dry ditches were recorded within the woodland habitat and along the boundary of the site.

3.5.7 Earth Bank (J2.3.8.)

Two earth banks that are covered with vegetation were recorded in the south eastern section of the site.

3.5.8 Buildings (J3.6)

Several buildings and WwTW structures with roofs or sealed containers were recorded throughout the site. Four buildings contained corrugated metal roofs. Two buildings comprised of half corrugated and brick walls, with roof voids (Figure 12) the other two were majority comprised of corrugated walls (Figure 13) and were more like sheds with no roof voids.

Figure 12: Example of building



Figure 13: Example of shed



3.5.9 Hardstanding (J5)

Hardstanding features such as access roads and WwTW structures were recorded throughout the site.

3.5.10 Fence (J2.4)

The entire perimeter of the site is enclosed by post and wire fencing.

3.6 Habitat Survey – Protected and Notable Species

The following species were recorded during the assessment. Where habitats suitable to support specific species were identified, the potential for those species has also been recorded.

3.6.1 Birds

The woodlands, hedgerows and tall ruderal offers nesting potential for breeding birds. During the survey the following species were recorded pied wagtail (*Motacilla alba*), wren (*Troglodytes troglodytes*), blue tit (*Cyanistes caeruleus*), robin (*Erithacus rubecula*), blackbird (*Turdus merula*), magpie (*Pica pica*), grey wagtail (*Motacilla cinerea*), carrion crow (*Corvus corone*), green woodpecker (*Picus viridis*), jackdaw (*Corvus monedula*), linnets (*Linaria cannabina*), black-headed gull (*Chroicocephalus ridibundus*), swallow (*Hirundo rustica*), woodpigeon (*Columba palumbus*), goldfinch (*Carduelis carduelis*), house martin (*Delichon urbicum*) and herring gull (*Larus argentatus*). The site is considered to have potential to support common bird species.

3.6.2 Mammals

Evidence of common mammal species such as grey squirrel (*Sciurus carolinensis*), fox (*Vulpes vulpes*) and rabbit (*Oryctolagus cuniculus*) were recorded on site.

No badgers (*Meles meles*) or evidence of badger were recorded on site. No breaks in the security fence were observed that would allow badgers to enter the site. A dry ditch culvert and open gate located in the south eastern corner was observed that may allow badgers to enter the site. It is considered that the surrounding habitat is suitable to support badgers. As two potential access points were observed, badgers are considered to have access to the site and therefore are assessed further in this report.

No otters (*Lutra lutra*) or habitats to support this species were recorded within the site. As such otters are no longer considered within this assessment.

No dormouse (*Muscardinus avellanarius*) or evidence of dormouse were recorded on site. The site contains suitable habitat to support this species in both woodland habitats which contain feed species; hazel, oak, bramble, ash, hornbeam, silver birch and hawthorn. This species is assessed further in this report as suitable habitat is present on site.

No bats or evidence of bats were recorded on site. The site contains suitable habitat to support roosting and foraging bats. Suitable features to support foraging bats include a number of mature oak trees located within and adjacent to the site (TN2, 3, 4, 5 & 6). The two buildings constructed of corrugated and brick walls were in good condition and where the corrugated metal meets the brick walls the joints were tight. Minimal features considered suitable for roosting bats, such as holes, were observed along the control and administration building (TN13). The woodlands and wastewater features contain suitable foraging habitat for bats.

3.6.3 Reptiles and Amphibians

No reptiles or amphibians or evidence of these species were recorded on site. The site contains suitable foraging habitat for both species groups. Four hibernacula features that could be suitable to support both reptiles and amphibians were recorded on site (TN7, 8, 9 & 10).

3.6.4 Invertebrates

No protected or notable invertebrates or habitat that has the potential to support these species were observed within the site. Invertebrates are therefore no longer considered within this report.

3.6.5 Invasive Non-Native Species

Himalayan balsam was recorded within the semi-natural broad-leaved woodland and tall ruderal habitat located in the eastern section of the site (TN11). Japanese knotweed (*Fallopia japonica*) was not recorded within the site boundary, but several stands of Japanese knotweed were recorded along the access road (Green Lane) (TN12).

4 Conclusions

The PEA was undertaken to assess the potential impact of the proposed works at Cog Moors WwTW on designated sites, protected and notable habitats and species. The proposed works are for the installation of an advanced digestion facility.

4.1.1 Designated Sites

Cog Moors SSSI is located as part of the western section of the WwTW site. No works are scheduled within the area designated as part of the SSSI. This part of the site comprised of WwTW structures and amenity grassland. No designating key features for the SSSI were observed within the current WwTW site boundary. It is considered that the current SSSI boundary is out of date. Until this information is renewed, any works are to occur within this area will require consultation with Natural Resources Wales (NRW).

Cog Moors SINC is located to the south east of the main site. One of the fields (TN1) may be used as an area to store excess soil generated by the proposed works. A dedicated National Vegetation Classification (NVC) grassland survey is required to assess the potential impacts fully and to determine avoidance, mitigation and enhancement requirements if this area is to be used to store soil. Further consultation with the Vale of Glamorgan's county ecologist is recommended for any proposed works within the SINC.

4.1.2 Protected and / or Notable Species

The habitats within the site boundary of the WwTW are considered to be of moderate ecological value with habitat types that vary between woodland and hardstanding and managed habitats. The woodland, hedgerow and tall ruderal habitats are considered suitable to support breeding birds, badgers, dormice, bats, reptiles and great crested newts. The proposed works are likely to have an impact on suitable habitat to support protected and notable species. Further surveys are therefore recommended to confirm the presence / absence of protected species and then to assess potential impacts on these species and to determine any mitigation requirements. Recommendations for further surveys or mitigation are detailed in Section 5.

5 Recommendations

Following the assessment of ecological constraints at the site the below recommendations are made:

Table 4: Recommendation

Ecological Feature	Recommendations
Designated Sites	
Cog Moors (SNIC)	An NVC survey will be required if the field to the south of the site is to be used for excess soil storage. The survey will follow standard methodology set out in the Joint Nature Conservation Committee (JNCC) NVC Users Handbook. Further consultation with the Vale of Glamorgan's county ecologist is required.
Protected and Notable Species	
Birds	<p>The site contains features to support nesting birds; within the woodlands, hedgerows and tall ruderal habitats. To prevent any potential impact to breeding birds the following general recommendations are made:</p> <p>It is recommended that the clearance of vegetation is avoided, where possible, but where vegetation must be removed, the following measures should be adhered to:</p> <ul style="list-style-type: none"> ● All clearance works should be undertaken outside the nesting season. This is widely considered to be from March to August inclusive, but can vary depending on the species and / or seasonal conditions. ● Where vegetation cannot be removed outside of the nesting season, pre-clearance checks must be undertaken by an experienced ecologist to identify if any birds are nesting within or close to the vegetation due to be removed. An informed decision should then be made if the vegetation clearance can be undertaken. If a bird nest is found, it must be left in-situ and protected from works; no works can be undertaken in that area until the young birds have fledged from the nest site. This may take several weeks and will vary depending on the species. ● All construction related lighting should be designed and fitted to minimise any adverse impacts on the retained surrounding vegetation. Such measures include the use of hoods and cowls and directional lighting away from features such as trees and scrub. ● All construction works should be restricted where possible to daylight hours to prevent any adverse impacts on roosting birds at dusk and dawn. ● In the event that any Schedule 1 species or active Schedule 1 nest sites are identified during construction, all works must be suspended within that area and advice sought from a suitably qualified ecologist on the most appropriate course of action.
Badger	<p>No badgers or setts were observed on site. Badgers are omnivores with a large part of their diet consisting of earthworms; they will also eat other invertebrates, nuts, fruit and cereals. The woodlands, hedgerows and grassland are likely to provide food throughout the year and are considered to be suitable foraging habitat within the site and surrounding area for this species.</p> <p>Badgers can leave existing setts and establish new setts very quickly. It is recommended that a pre-construction walkover survey of any working area of the site and a buffer of 30m be undertaken to confirm the continued absence of any active badger setts. This should be undertaken approximately eight weeks before the works commence. Eight weeks will allow for appropriate licences to be obtained if new active setts are recorded that would be impacted by the works.</p>
Dormouse	<p>Areas of suitable habitat for dormice include woodlands and hedgerows. The development of the site has the potential to result in the loss of large proportions of suitable woodland habitat. Further surveys will be required to establish the presence or absence of dormice on the site. These surveys can be undertaken between April and November.</p>
Bats	<p>Eleven mature oaks that are scheduled to be removed were identified as containing suitable features to support roosting bats. In addition, 2 trees with suitable features to support roosting bats are located within 20m of the proposed works area. The overall site is considered to</p>

Ecological Feature	Recommendations
	<p>have high potential to support foraging bats. It is recommended that further surveys are undertaken to establish if the identified trees are being used by roosting bats. Further surveys may include tree climbing inspection surveys and / or emergence / re-entry surveys. Tree surveys can be undertaken at any time of the year; emergence / re-entry surveys are to be carried out between May and August.</p> <p>No access was granted to the woodland located to the east of the fenced off area. Further surveys within this area is required.</p>
Reptiles	<p>The mosaic habitat types and suitable refugia on site are considered suitable to support reptiles. Any vegetation clearance outside of intensely managed (and short mown) grassland (trees, tall ruderal and long grass) should be carried out in a phased manner under ecological supervision and in one direction towards suitable retained habitat.</p> <p>Vegetation clearance should be undertaken between April and the end of October, whilst reptiles and amphibians are active using a reptile sensitive methodology. By carrying out the works in a directional manner animals are flushed towards suitable habitat and are less likely to return to the cleared area.</p> <p>A toolbox talk should be provided to all those working on site. If evidence of reptiles is found, work should cease until advice has been obtained from the site ecologist.</p>
Great Crested Newts	<p>Five ponds were identified within 250m of the site. The mosaic habitat types and suitable refugia on site are considered suitable to support foraging and hibernating great crested newts. Development of the site could potentially lead to the loss and fragmentation of suitable habitat that support this species. Great crested newt eDNA surveys should be undertaken between the 15th April – 30th of June. If great crested newts are found to be present then a population size class survey should be undertaken between March and June to confirm the presence or absence of protected amphibians within the site and surrounding local area.</p>
Invasive Species	<p>The proposed works area contains Himalayan balsam, an invasive species method statement is required for all works within this area.</p> <p>A 7m working buffer is required to be maintained from any stands of Japanese knotweed for works that involve vegetation clearance or breaking ground.</p>

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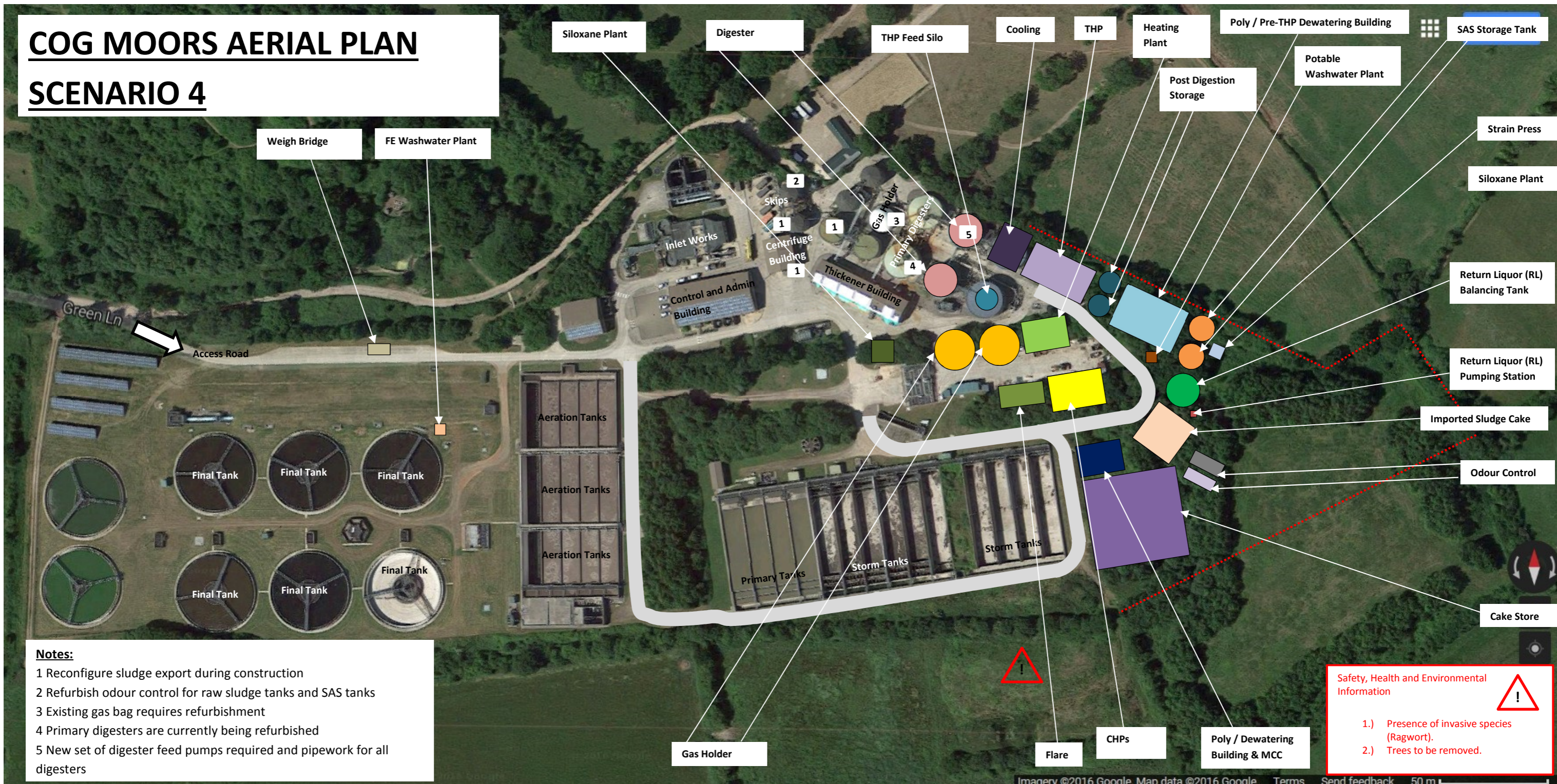
Appendices

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A. Maps

COG MOORS AERIAL PLAN

SCENARIO 4



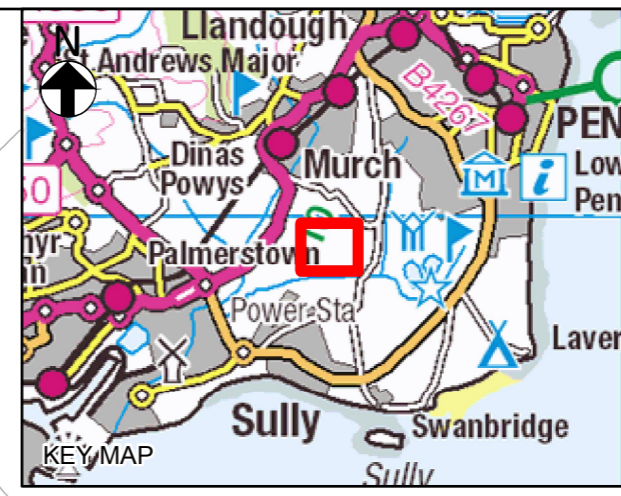
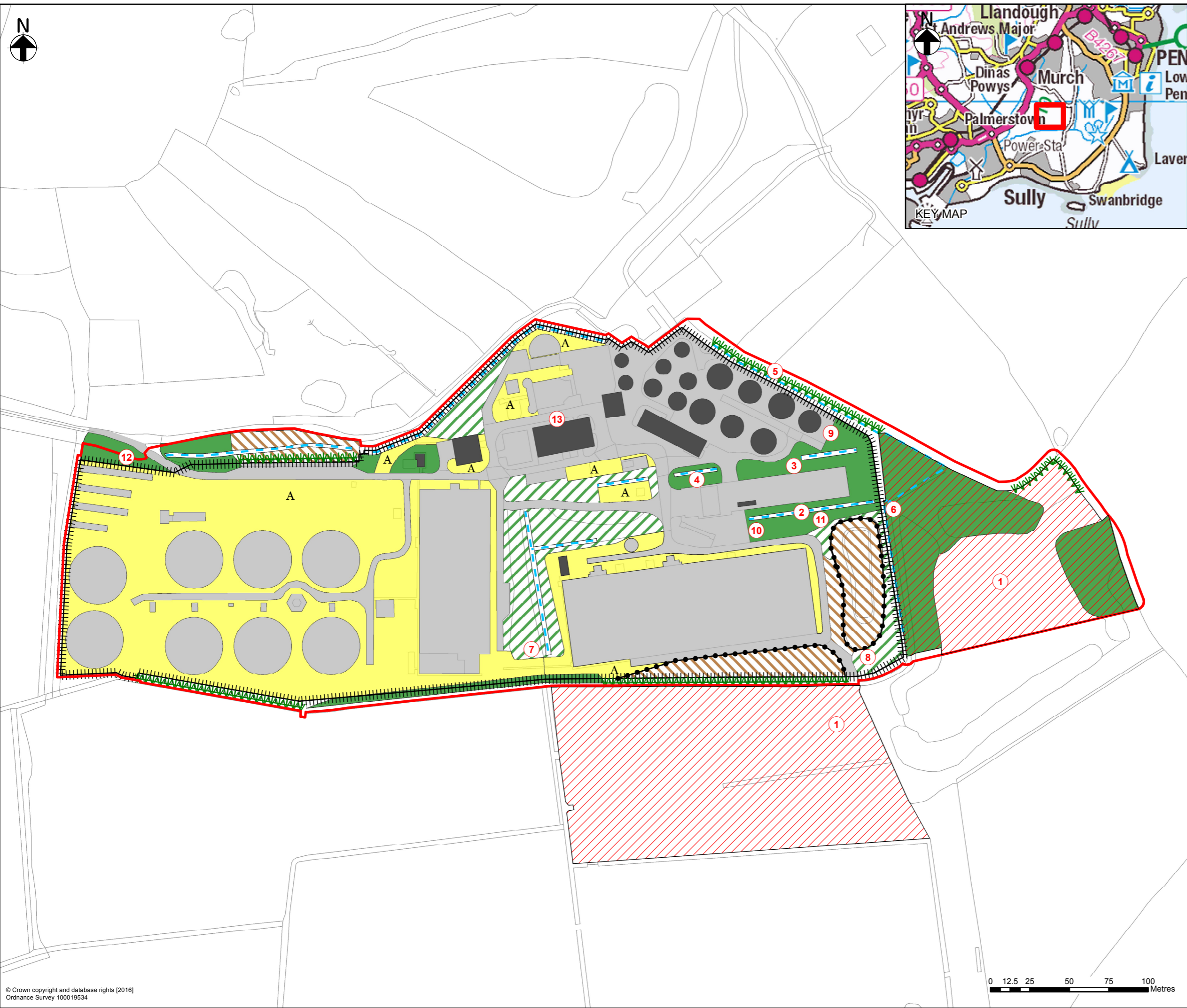
Notes:

- 1 Reconfigure sludge export during construction
- 2 Refurbish odour control for raw sludge tanks and SAS tanks
- 3 Existing gas bag requires refurbishment
- 4 Primary digesters are currently being refurbished
- 5 New set of digester feed pumps required and pipework for all digesters

Safety, Health and Environmental Information

- 1.) Presence of invasive species (Ragwort).
- 2.) Trees to be removed.

	SAS Storage (2 x 15m dia. = 353m ²)		Odour Control (10 x 5m = 50m ²)		Cake Store (40 x 42m = 1680m ²)		Flare (20 x 10m = 200m ²)		50m
	Weigh Bridge (5 x 10m = 50m ²)		Strain Press (6 x 6m = 36m ²)		Odour Control (10 x 5m = 50m ²)		Siloxane Plant (10 x 5m = 50m ²)		25m
	Imported Sludge Cake Reception (20 x 20m = 400m ²)		Poly / Pre-THP Dewatering Building (30 x 20m = 600m ²)		THP (30 x 15m = 450m ²)		CHPs (16 x 24m = 384m ²)		10m
	FE Washwater Plant (5 x 5m = 25m ²)		THP Feed Silo (10m dia. = 78m ²)		Cooling (14 x 18m = 252m ²)		Gas Holder (2 x 18m dia. = 509m ²)		Return Liquor (RL) Balancing Tank (15m dia. = 177m ²)
	Potable Washwater Plant (5 x 5m = 25m ²)		Post Digestion Storage (2nr x 10m dia. = 157m ²)		Heating Plant (20 x 14m = 280m ²)		Digester (15m dia. = 177m ²)		RL PS (3 x 3m = 9m ²)



Legend

- ① Target note
- 🌿 J2.3.1 - Hedge with trees - native species-rich
- ||||| J2.4 - Fence
- - - J2.6 - Dry ditch
- J2.8 - Earth bank
- 🌳 A1.1.1 - Broadleaved woodland - semi-natural
- 🌿 A1.1.2 - Broadleaved woodland - plantation
- 🌾 C3.1 - Other tall herb and fern - ruderal
- 🏡 J1.2 - Cultivated/disturbed land - amenity grassland
- 🏢 J3.6 - Buildings & infrastructure
- 🏠 J5 - Hardstanding
- 📐 Site Boundary
- 🚫 Restricted Access - Not surveyed during PEA

P2	02/11/2016	JW	Preliminary issue	JB	CW	02/11/2016
Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.


Mott MacDonald Bentley

Cynghair Cyflawni Cyfalaf
 Ty Awon, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name: South Sludge Strategy

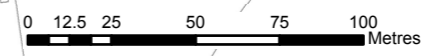
Drawing Title: Phase 1 Habitat Map

Suitability: Preliminary Suitability Code: PRE

Originator: JW Designer: JJB Date: 02/11/2016

Internal Project Number: QN29 Scale: 1:2,250 Rev: P2

Drawing Number: 4798-S-202-MMB-06-LP-N1-G1-01001



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B. Target Notes

Table 5: Target Notes

Target Number	Details
1	Field containing unmanaged neutral semi-improved grassland, no assess at time of survey.
2	Area of mature woodland that contains 6 trees with suitable features to support roosting bats to be removed as part of the works.
3	Area of mature woodland that contains 2 trees with suitable features to support roosting bats to be removed as part of the works.
4	Area of mature woodland that contains 1 tree with suitable features to support roosting bats to be removed as part of the works.
5	Two mature oak outside of the site boundary that contains suitable features to support roosting bats.
6	Two mature oak outside of the site boundary that contain suitable features to support roosting bats to be removed as part of the works.
7	Log pile that is considered a potential as a hibernacula feature.
8	A pile of wood that is considered a potential as a hibernacula feature.
9	A pile of wood that is considered a potential as a hibernacula feature
10	A pile of wood that is considered a potential as a hibernacula feature
11	Area containing Himalayan balsam.
12	Stand of Japanese knotweed outside of site boundary.
13	Control and administration building