

R I C H A R D S
M O O R E H E A D & L A I N G L T D

LAND RESTORATION AT CEFN Y BEDD, WREXHAM

Supporting Statement

for

MOORBRIDGE CONSTRUCTION

December 2010

2909/11



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Prepared by:	Susan Roberts, Rhodri Edwards, Stuart Kato	Date:	04.11.2010
Checked by:	Stephen Blunt	Date:	07.12.2010
Approved by:		Date:	

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CONTENTS

	Page no.
1 INTRODUCTION	1
1.1 Planning Application and non-statutory Supporting Statement	1
1.2 Structure of this supporting statement	1
2 DESCRIPTION OF THE LAND RESTORATION PROPOSAL	2
2.1 Location of the proposal	2
2.2 Existing use of the site	2
2.3 Rationale for the land restoration proposal	2
2.4 Site operations	4
2.5 Fencing and site access	4
2.6 Advance wildlife mitigation	5
2.7 Importation, filling and grading	5
2.8 Site accommodation, fuel storage and pollution control	7
2.9 Handling of inert fill and soil	8
2.10 Proposed use and sources of inert fill and soils for restoration	9
2.11 Establishment aftercare and management of the site	9
2.12 Use of materials, wastes and residues	9
3 POLICY REVIEW	10
3.1 Introduction	10
3.2 Planning policies and the effect of development	10
4 LAND USE	14
4.1 Land Use and Land Quality	14
4.2 Effect of the proposed restoration	15
5 LANDSCAPE EFFECTS AND VISUAL IMPACTS	16
5.1 Background	16
5.2 Method of landscape assessment	16
5.3 Method of the Visual Impact Assessment	17
5.4 The Landscape Evaluation	19
5.5 The Landscape Assessment	21
5.6 The visual impact assessment	22

5.7	Impact of change upon the landscape	25
5.8	Effect on views from viewpoints	25
6	ECOLOGY AND NATURE CONSERVATION	26
6.1	Introduction	26
6.2	Summary of survey methods	27
6.3	Results of ecological investigations	29
6.4	Assessment of impacts and mitigation required	38
7	DUST ASSESSMENT	45
7.1	Introduction and method	45
7.2	Site operations and dust control	45
7.3	Receptors	46
7.4	Assessment of impact, mitigation and post mitigation impacts	47
8	NOISE AND VIBRATION	47
8.1	Introduction	47
8.2	Background noise	49
8.3	Prediction of noise level from the proposed operations	50
8.4	Discussion of results of the noise assessment	54
8.5	Conclusions	54
9	GEOLOGY AND SOILS	55
9.1	Introduction and background to site	55
9.2	Sites of Geological and Ecological Interest	55
9.3	Landfills	55
9.4	Regional Geology	56
9.5	Solid	57
9.6	Superficial deposits	57
9.7	Local Geology	58
9.8	Colliery spoil	59
10	WATER QUALITY AND DRAINAGE	60
10.1	Introduction and background	60
10.2	Scope of assessment	60
10.3	Data sources	60
10.4	Hydrology	61

10.5	Hydrogeology	64
10.6	Aquifer properties	65
10.7	Existing Condition	68
10.8	Control of Site Restoration operations	69
10.9	Proposed water management during restoration	70
10.10	Potential Impacts and Mitigation measures	71
10.11	Hydrology summary and conclusions	73
11	CULTURAL HERITAGE	75
11.1	Information obtained	75
11.2	Impact of proposed works	76
12	PEDESTRIAN AND VEHICLE ACCESS, ROADS AND RIGHTS OF WAY AND COMMUNITY EFFECTS	77
12.1	Rights of Way	77
12.2	Community Effects	77
13	TRAFFIC	78
13.1	Introduction	78
13.2	Method of assessment	78
13.3	Findings	78
14	CONSULTATIONS	80
14.1	Local residents	80

List of Tables

Table 1	Planning application drawings	1
Table 2	Proposed road transport	6
Table 3	Proposed hours of working	6
Table 4	Proposed site plant	7
Table 5	Minerals Planning Policy Wales	10
Table 6	Wrexham Unitary Development Plan	12
Table 7	Location of landfill sites	14

Table 8	Definition of terms used in visual impact assessment and visual impact schedules.	18
Table 9	Wildlife sites within 1000m of proposal	29
Table 10	Category 1 species within 1000m of proposal	29
Table 11	Great Crested Newt survey results	32
Table 12	Reptile survey visits	34
Table 13	Birds observed on site	36
Table 14	Potential receptors for dust	46
Table 15	Noise receptor locations	49
Table 16	Predicted noise levels from site operations: plant	53
Table 17	Calculated noise at receptor locations	53
Table 18	Location of landfill sites	56
Table 19	Solid geology sequence	57
Table 20	Summary of the trial pits	59
Table 21	LTA monthly rainfall data (mm)	64

1 INTRODUCTION

1.1 Planning Application and non-statutory Supporting Statement

- 1.1.1 Moorbridge Construction Limited are applying for planning permission for the ‘Restoration of land to agriculture’ at Park Road, Cefn y Bedd, Wrexham. Inert material will be used to restore the land to agricultural and nature conservation after-uses.
- 1.1.2 In accordance with the requirements of the Planning (Environmental Impact Assessment) (England and Wales) Regulations: a request for a Screening Opinion was submitted on 30th June 2010. The screening opinion reference SO/2010/018 dated 19 July 2010 stated that a formal Environmental Impact Assessment was not required.
- 1.1.3 This Supporting Statement has been prepared by Richards, Moorehead & Laing Ltd to provide additional information to assist the relevant statutory bodies in considering the planning application. It also provides the information usually required within a Design and Access Statement.
- 1.1.4 The drawings accompanying the planning application are listed in Table 1. Additional figures are provided in an appendix to this Statement.

Table 1 Planning application drawings

Reference Number	Drawing Title
2909/01	Location Plan
2909/02	Site Plan (Existing)
2909/03	Restoration Plan
2909/04	Cross Sections
2909/05	Working Plan
2909/06	Detail of site access

1.2 Structure of this supporting statement

- 1.2.1 This Statement describes the purpose and methods of the proposed land restoration (Section 2). It then presents a review of relevant policies (Section 3), and describes

the environment of the site under a series of topics (Sections 4 to 13) each with an assessment of any impacts that the proposed restoration might have.

2 DESCRIPTION OF THE LAND RESTORATION PROPOSAL

2.1 Location of the proposal

2.1.1 The site is a disused sand and gravel pit which is centred at Ordnance Survey grid reference SJ 3146 5575; adjacent to Park Road, Cefn y Bedd, Wrexham. As shown in drawing 2909/01, the site is situated to the north of the Alyn Waters Country Park and to the west of Llay Industrial Estate.

2.1.2 The area of the site is 2.95 ha.

2.2 Existing use of the site

2.2.1 The site is a former sand and gravel working which is not currently in use although unauthorised activities including fly-tipping, motorcycling and clay pigeon shooting do take place.

2.3 Rationale for the land restoration proposal

2.3.1 Moorbridge Construction proposes to restore the land to hay meadow and nature conservation uses, on behalf of the owner. The duration of the restoration is dependent on the supply of inert fill. The restoration is anticipated to take a period of 3 - 5 years, to be followed by aftercare to ensure the establishment of vegetation.

2.3.2 The design objective is to create a dome-shaped landform for use as a hay meadow, with gentle gradients sufficient to avoid ponding of surface water. The land would slope towards the southern, western and northern boundaries of the site, forming a shallow and sheltered 'valley' containing a mix of low-intensity grazing and nature conservation areas, damp grassland with a series of undulations to form a series of small pools.

- 2.3.3 The objective of restoration is to bring the land back to the standard required for agricultural (hay) management and nature conservation after-uses. To do this, fill and soil-making materials will be imported and placed in the correct sequence, to give suitable landforms and levels. Restoration will ensure that some areas develop appropriate moderately-fertile topsoil which can be cropped as permanent pasture (cut for hay and then grazed), whilst areas intended for nature conservation after-use will be prepared with nutrient-poor substrates so that they become botanically diverse. Controlled grazing will be used as a management tool for the nature conservation areas of the site.
- 2.3.4 A substantial part of the site consists of colliery spoil infill, and so it will be necessary to import suitable soil-making material to give sufficient depth of rooting for agricultural grassland. The proposed landform has been designed to achieve this without bringing the level significantly above that of the nearby road. The landform also takes account of a shallow pond containing Great Crested Newts (see section 6) which it is intended to protect, and the Wat's Dyke historic earthwork which forms the western boundary of the site (see section 11).
- 2.3.5 To enhance the nature conservation value of the pond, the landform has been designed to direct any winter surface run-off through the shallow valley and seasonal pools into the existing pond. As most of the material imported to the site will be free draining, selected clay-rich material will be segregated and will be used in the 'valley' to slow down infiltration and allow water to be held. Further details of the proposed site hydrology are given in section 10.

Environmental Permit

- 2.3.6 The landform has been designed to meet the objectives for restoration to agriculture and nature conservation, and could be achieved by importing and using waste materials as a 'recovery operation' in accordance with the Environmental Permitting Regulations (England and Wales) 2010 and the EA document EPR 13 'Defining Waste Recovery: Permanent Deposit of Waste on Land' v1.0.

2.4 Site operations

Phasing and sequence of working

2.4.1 Restoration will be carried out progressively, in a sequence of operations conducted in response to the availability of inert fill. This availability is dictated by contracts won by the applicant company within an economic transport radius of the site. As a result it is not possible to define the timescales for the working of phases. The working plan (Drawing 2909/05) therefore shows a general direction of working rather than discrete phases of work. It is likely that working will be intermittent, with inert material being imported for a number of days or weeks and then not for a similar period.

2.4.2 The site will initially be prepared by:

- Installation of boundary fencing for security and site safety
- Formation of access from Park Road
- Completion of advance wildlife mitigation e.g. exclusion of Great Crested Newts from working area

2.4.3 The sequence of operations for each area of the site would be:

- Removal of existing vegetation (for disposal or relocation as appropriate)
- Extending the site haul road to serve the working area
- Tip and grade imported fill material
- Place soil-making materials and grade to final contours
- Establish vegetation by sowing, planting or transplanting as appropriate.

2.4.4 Further detail of these operations is given in sections 2.5 - 2.11 and the drawings.

2.5 Fencing and site access

2.5.1 A chain-link fence will be erected within the hedgeline along the eastern boundary of the site, bordering Park Road, to ensure that there will be no unauthorised tipping of material and to exclude the motorcycles which currently use the site without permission. The proposed site access is to be located approximately 70 metres from

the Llay Road junction on the outside of a bend in Park Road. The site access will be formed as shown in drawing 2909/06 and gated, so that all vehicles can drive in and out without reversing. The gateway will be surfaced.

- 2.5.2 A timber fence, designed to provide visual and noise screening, will be erected along the northern boundary of the site for the benefit of the day nursery and Lane End. The specification for the fence will meet the requirements of British Standard 5228-1:2009 Annex B in order that a noise reduction of at least 5dBA is achieved.

2.6 Advance wildlife mitigation

- 2.6.1 Work at this site will be carried out in accordance with the conditions of a Welsh Assembly Government licence for development work affecting a European Protected Species (Great Crested Newt). It is anticipated that this licence will require the exclusion of Great Crested Newts ('GCN') from the working area by means of temporary amphibian fencing and a trapping – relocation programme. Details of this programme are set out in Section 6.
- 2.6.2 Where necessary, the felling or clearance of trees and scrub will be conducted outside the bird nesting season which is from approximately 1st March – 30th September, or only after a suitable qualified ecologist has confirmed that there are no nesting birds in the area of works.

2.7 Importation, filling and grading

- 2.7.1 Restoration to the levels proposed in the application will require the importation of approximately 60,000m³ of material. This is expected to come from sources within a radius of approximately 25 miles from the site.

Importation of inert fill

- 2.7.2 The importation of 60,000 m³ of restoration materials will require approximately 6,000 loads, assuming that each load is 10m³ (16 – 18t). For a three-year period of material importation, and 250 working days per year, this equates to an average of 8 loads in per day. The activity will be intermittent, depending on the availability of restoration fill. The vehicles to be used will be 6-wheel or 8-wheel rigid tippers with

a 10m³ load capacity. Larger, articulated vehicles will not be used, to avoid difficulty at the site entrance and the junction with the B5102 Llay Road. All vehicle movements into and out of the site will be restricted to using the Llay Road junction. No vehicles will be allowed to approach or leave the site along Park Road south of the site entrance.

Table 2 Proposed road transport

Activity	Average daily number	Maximum daily number
Loaded vehicles (18t capacity) entering site daily.	8 loads of restoration material in (vehicle leaves empty).	30 loads of restoration material in (vehicle leaves empty).
Other vehicles entering site daily (employees).	2	4

2.7.3 To control the materials and deposition process, inert fill and soil-making materials will be brought in by appointment, using regular hauliers. There will not be an ‘open gate’ policy. Moorbridge Construction recently completed an inert landfill at the railway cutting at Hollybush Inn, Llay Road, Cefn y Bedd (to the west of the site) using a similar operating system (Flintshire County Council planning reference 044515).

2.7.4 All importation of material would be within the working hours set out in the planning application and shown in Table 3.

Table 3 Proposed hours of working

Activity	Time periods, hours	Days of week*
Filling, soil placement and restoration.	07.00 - 18.00	Mon – Fri
	07.00 - 13.00	Sat
Vehicle movements	07.00 - 18.00	Mon – Fri
	07.00 - 13.00	Sat

*Excepting Bank Holidays and the Saturday preceding a Bank Holiday Monday.

- 2.7.5 The site would be operated periodically and so there would be no fixed plant. Mobile plant would be brought to the site for earthworks and preparing the restored areas for seeding or planting. The plant types anticipated are shown in Table 4.

Table 4 Proposed site plant

Activity	Vehicle
Importation of inert fill and soil	HGVs (6-wheel or 8-wheel rigid tippers, 10m ³ capacity)
Soil movement within site	Site dumper (where distance justifies) 360° excavator (for short distances)
Grading material	Tracked dozer (where tipping rate justifies) 360° excavator (for smaller quantities)
Soil placement, preparation for seeding	360° excavator, light tracked dozer, agricultural cultivation plant

2.8 Site accommodation, fuel storage and pollution control

Site accommodation

- 2.8.1 The operator would have staff on site at all working times. This would require a small temporary office and storage unit, locked and shuttered when not in use. Staff would be provided with a self-contained portable toilet. This would be maintained regularly in accordance with company procedures. The office, storage unit and overnight parking for site plant would be contained within a secure fence, and monitored by security cameras when the site is not operational.

Fuel storage and refuelling

- 2.8.2 There will be no storage of fuel on site or re-fuelling on site. Spill kits will be kept in the cabs of plant and machinery should a fuel leak occur.

Pollution control

- 2.8.3 All lorry movements within the site would be on haul routes surfaced with road planings to minimise mud and dust generation. Dust minimising procedures will include the use of a mobile bowser to damp down haul routes, and if necessary halting operations during dry and windy conditions. A wheel-wash would be located on site as shown in the drawings, and used by all lorries before leaving the site so that mud would not be carried onto the public road. The operator has a road sweeper

available locally should this be required, although in his recent operation at Hollybush the sweeper was never needed.

Other hazardous materials

2.8.4 No other hazardous materials will be used or stored on site.

2.9 Handling of inert fill and soil

2.9.1 Inert fill and or soil (material) brought to site for restoration purposes would be placed directly into the final position wherever possible. If materials are available for importing but site conditions are too wet or otherwise unsuitable, then the material would be stockpiled for short periods until conditions become favourable. Soils would be stored for the minimum period possible, in bunds constructed in accordance with the following principles:

- Seed-rich topsoil, subsoil and any overburden from site to be stockpiled separately;
- Soil-forming materials imported to site to be stockpiled separately, to allow selective use or blending to achieve restoration soil profiles;
- Stockpiles to stand on ground which is free from waterlogging or inundation;
- Temporary topsoil stockpiles to be not more than 2.0m deep to avoid anaerobic conditions or compaction;
- Soils and overburden mounds to be loose-tipped and not compacted. The tops to be shaped as ridges or domes to shed water, using an excavator bucket and not a bulldozer.

2.9.2 The procedure for placing materials during restoration would follow these principles:

- Restoration and soil placement would take place only in conditions which are sufficiently dry to avoid compaction;
- In dry conditions, the stored subsoil would be transported by dump truck following defined routes, to avoid impeding drainage, and loose-tipped and graded out using a light tracked bulldozer;
- If soil placement has to proceed in conditions when the soils are wetter, a modified system would be adopted. Subsoil and topsoil would be transported by dump truck following defined routes, and tipped close to a 360° excavator which would place soils in their final position and cultivate the wheel tracks

from the dump trucks. In this way no vehicle would traverse cultivated areas or the soils;

- Any seed-rich topsoil salvaged from the site would be spread thinly over designated areas of site-won subsoil or overburden.

2.10 Proposed use and sources of inert fill and soils for restoration

2.10.1 Inert fill and soil is to be imported to site to restore land to low-intensity agricultural and nature conservation after-uses. Material will be in the form of gravel, sand, clays, brick, concrete, tiles, ceramics, stones and soil which will form part of the restoration project. Sources of material are likely to be demolition and construction sites.

2.10.2 Concrete and other hard material within loads of soil will be sorted and carefully set aside for use in forming haul roads and hardstanding. If it is necessary to crush this concrete, a mobile crushing plant with its own Environmental Permit will be brought to the site to carry out this operation. There will not be a recycling centre at the restoration site.

2.11 Establishment aftercare and management of the site

2.11.1 A 5 year aftercare and management programme will be implemented by Moorbridge Construction Limited, after which the site will be transferred back to the owner.

2.11.2 The ecological aftercare and management programme is described in section 6.

2.12 Use of materials, wastes and residues

2.12.1 Inert fill will be imported as part of the land restoration project. If there is an excess of concrete or hard materials these will be removed from site for use in construction elsewhere. There will be no residual waste from this operation.

3 POLICY REVIEW

3.1 Introduction

- 3.1.1 This section examines the proposed restoration of the former sand and gravel working in the context of Planning Policy Wales, and minerals and waste planning policies adopted by the Wrexham County Borough Council (as the Mineral Planning Authority) in the Wrexham Unitary Development Plan 1996 -2010 (Adopted, 14th February 2005).

3.2 Planning policies and the effect of development

National Policy

- 3.2.1 General planning policy relevant to the proposed development is given in the Restoration and Aftercare and After-use sections of ‘Minerals Planning Policy Wales’ (MPPW), and in Technical Advice Note 21 ‘Construction and Demolition Waste’.

Minerals Planning Policy Wales

- 3.2.2 Relevant policies from Minerals Planning Policy Wales are presented within Table 5 together with an explanation of how the proposal relates to each policy.

Table 5 Minerals Planning Policy Wales

48. ‘Unless new mineral extraction provides satisfactory and suitable restoration, planning permission should be refused. Planning conditions should ensure that land affected by mineral extraction is restored to a high standard suitable for its agreed after-use at the earliest opportunity, and work begun within 6 months of cessation of working wherever this is practicable (except where progressive restoration has already commenced). Restoration and aftercare should provide the means to at least maintain, and preferably enhance, the long-term quality of land and landscapes taken for mineral extraction. This will be to the benefit of local communities and ensure that a valuable natural asset will be passed on to future generations.’

The existing site is an old mineral working believed to date from the 1960s which has not been restored. The site is currently affected by unauthorised motorcycling, clay pigeon shooting and sporadic fly tipping. Restoration to agriculture and nature conservation would enhance the site and ensure viable long-term care.

49. ‘Reclamation can provide opportunities for creating, or enhancing, sites for nature conservation and contribute to the targets in the UK Biodiversity Action Plan and those adopted in local Biodiversity Action Plans throughout Wales.’

The restoration proposal aims to enhance the Favourable Conservation Status of the Great Crested Newt, by improving the existing breeding pond on site and creating further seasonal ponds. A diversity of habitats will be retained and improved. The risk of further fly tipping and motorcycle disturbance will be reduced.

50. 'In view of the long life of many mineral working sites, it is essential that progressive restoration is introduced at the earliest opportunity where appropriate and practicable. The increased use of phased restoration reduces the visual impact of mineral activities at any one time and provides continuity of restoration works throughout the active operations so reducing the potential environmental damage left by any failure to restore.'

The proposal is for restoration and not new mineral working. Vegetation establishment will be carried out progressively as each part of the site reaches its final landform.

52. 'After-uses may include agriculture, forestry/woodland, nature conservation, public open space, recreation or other development. A separate planning permission is likely to be required for any after-use except agriculture, forestry, nature conservation or informal recreation which is normally permitted development. Where appropriate, unitary development plans, informed by landscape assessments, local biodiversity action plans and countryside strategies, should provide guidance on the preferred after-uses and reclamation standards. A choice of after-use will depend on many issues including the overall strategy of the unitary development plan as well as the location, final landform, availability and quality of soils or other restoration materials and neighbouring land uses. The guiding principles determining the potential after-use of a site should form part of the application submission for proposed mineral extraction or the review of mineral planning permissions, although flexibility and review will often be necessary during the life of the mineral operations. Using the guiding principles as a framework, and even for long term working sites, there must be a defined and acceptable minimum standard of restoration outlined at the application stage. To maximise the opportunities provided by the reclamation operation, it is essential that consultation is undertaken with the mineral planning authority prior to the submission of the application for mineral extraction to determine the most sensible guiding principles and thus the most appropriate after-use of the restored land.'

The proposed after-use is agriculture and nature conservation, matching that of the surrounding land, and therefore in accordance with this policy.

TAN21 (Waste)

- 3.2.3 TAN21 was published in November 2001 and provides advice about how the land use planning system should contribute to sustainable waste resource management. It promotes the reuse of materials that have fulfilled their primary use, but can be treated to make them capable of safely being used again. The site will be using suitable inert material to restore the land back to agricultural and nature conservation use.

Wrexham Unitary Development Plan

- 3.2.4 The following policies are published in the UDP. Each relevant policy and subsection is quoted and the agreement or potential conflict between the scheme and the policy described.

Table 6 Wrexham Unitary Development Plan

Policy MW1	Mineral Landbanks
Policy MW2	Sand and Gravel extraction
Policy MW3	Crushed Rock extraction
Policy MW4	Coal extraction
Policy MW5	Clay extraction
Policy MW6	Peat extraction
Policy MW7	Reworking Mineral Waste
All not applicable – no mineral extraction in this proposal	
Policy MW8	Restoration of mineral working sites
‘Proposals for the winning, working and processing of minerals should make provision for securing a beneficial after use. Sites should be progressively restored in accordance with the following criteria:- a) where the development comprises a single, discrete phase of working, restoration of the site should commence immediately on conclusion of all extraction and processing operations; b) where the development comprises two or more discrete phases of working, restoration of the site should be undertaken in sequence commencing as soon as extraction and processing operations within each phase have been completed; c) where the development comprises overlapping phases of working which prevent full restoration of each phase in sequence, deferred restoration of some phases may be acceptable within the broader context of the site restoration as a whole. d) if the restoration scheme entails the return to agriculture of land which is classified as Grades 1, 2 or 3a, the site should be restored as closely as practicable to its original grade.’	
Although not a proposal for mineral working, the project would achieve restoration of this former mineral working progressively.	
Policy MW9	Protection of mineral resources
‘Resources of sand and gravel, and clay will be safeguarded from non-mineral development in order to prevent the sterilisation of unworked minerals deposits. The identification of mineral resource areas gives no presumption in favour of the working of any deposits. Within such areas	

non-mineral development will be strongly resisted unless a resource assessment (or other information) is provided to demonstrate that no exploitable reserves exist within the development site. Where non-mineral development which materially prejudices minerals resources is granted planning permission on land holding minerals deposits, provision should be made for the prior removal of mineral deposits.'	
The sand and gravel working exhausted the available reserves, and so no mineral would be 'sterilised'. The site is to be restored to agricultural and nature conservation after-uses.	
Policy MW10	Inactive mineral sites
Policy MW11	Minerals buffer zones
Not applicable to this site.	
Policy MW12	Waste Management
'Waste management facilities will be located having regard to:- a) the best practicable environmental option; b) the waste hierarchy; c) the proximity principle. d) regional self-sufficiency. With the exception of landfilling, windrow composting or small-scale collection and recycling points, facilities for sorting, transferring and processing of waste will be permitted within sites on general industrial estates.'	
The restoration of this site using inert wastes is considered to be the BPEO, and the proposal offers an opportunity for re-using waste materials that are unavoidably generated by construction. The site would provide a use for material close to the place of origin ie within 25 mile radius and not generate cross-regional movement of materials.	
Policy MW13	Disposal of wastes
'The disposal of wastes will take place:- a) through landfilling of controlled wastes at sites with existing planning permissions; or b) at the source where the wastes are produced, subject to any necessary onsite treatment; or c) at purpose-built treatment and disposal facilities which comply with the principles set out in Policy MW12; or d) at sites where the deposit of inert wastes would enable land to be redeveloped. New proposals for landfilling of controlled wastes will not be permitted unless there is an exceptional and specific need to manage waste originating from within the County Borough and which cannot be received by existing sites.'	
The project will enable land to be restored for agricultural and nature conservation purposes by depositing inert wastes as (d) above. The inert waste will be generated from local sources within the County Borough and neighbouring area of Flintshire County Council. A nearby site for this material has recently been completed and closed, and the proposal would provide an alternative.	
Policy MW14	
'Proposals for the deposit of waste materials for the improvement of low grade agricultural land will only be permitted where:- a) it can be demonstrated that the improvement sought is reasonably necessary for the purposes of agriculture; and b) the volume of waste to be deposited	

is the minimum necessary to achieve the improvement sought.'

The site currently has no land-use. The site will be restored for agricultural and nature conservation purposes. The volume of waste will be the minimum necessary to achieve the landform necessary for agricultural use, and to provide suitable rooting medium for the various vegetation types intended.

- 3.2.4 Alternative sites currently licensed to accept wastes of the type proposed for use at Cefn y Bedd are shown in Table 7. Of these, Bryn y Gaer is understood to be nearing completion.

Table 7 Location of landfill sites

Name	Landfill licence type	Licence No	Operator	Distance from site
Authorised landfill sites				
Astbury Landfill (Rossett)	Hazardous household/ commercial and industrial waste	37116	WRG Environmental	2 km NE
Bryn-y-Gaer Quarry	Inert – taking non-biodegradable wastes (not construction)	37050	Ash Waste Services Ltd	1.8 km N

Information from Environment Agency web site map

- 3.2.5 Wrexham County Borough Council's draft Local Development Plan shows the wooded bank (Wat's Dyke) and Alyn river valley adjacent to the western boundary of the site as 'Special Landscape Area' but gives no particular designation to the proposal site. The proposal would not alter the wooded bank or river valley, but would improve the appearance of the adjacent land.

4 LAND USE

4.1 Land Use and Land Quality

- 4.1.1 The 1964 Ordnance Survey Map indicates that this site was in agricultural use at the time of survey (1961), but the areas to the east and south of the site are shown as workings for sand and gravel. Both these areas have since been restored to agricultural (pasture) land-use, and within the area to the east is now a lake locally known as the 'leak'.

- 4.1.2 The extraction of sand and gravel minerals at this site was a short-term activity which ceased over 20 years ago, and since that time the site has been unused. At some time under a previous ownership, colliery spoil was imported and tipped at the site leaving the present landform.
- 4.1.3 The proposal site is currently not in any defined use. The land is not part of a registered agricultural holding, and would be classed in the Agricultural Land Classification system as ‘land not in agricultural use’. Unauthorised uses of the land include off-road motorcycling, clay pigeon shooting and unauthorised fly-tipping. The owner has attempted to restrict access but more recently to no avail. Well-worn motorcycle tracks are clearly evident, indicating repeated use and the access routes taken. There have been numerous instances of vandalism at the site.
- 4.1.4 Other surrounding land uses and features include Wat’s Dyke, woodland and the valley of the River Alyn which bound the site to the west; and isolated houses, a children’s day nursery and Gwastad Hall Nursing Home which are located immediately north of the site. Llay colliery tip and industrial estate are located 620m to the northeast (approx 1200m from site centre to site centre).

4.2 Effect of the proposed restoration

- 4.2.1 The planned restoration would bring the land quality up to a standard sufficient for low-intensity grazing or hay production, so that a regular management regime could be established for the benefit of wildlife. It is anticipated that the owner would arrange hay cropping and periodic grazing with a neighbouring agricultural holding. The availability of some 2ha of additional land would make a small but beneficial contribution to the viability of a farm business.
- 4.2.2 The regular maintenance of the land through grazing and use as hay meadows should make the site less attractive for fly-tipping. As restoration would remove the existing steep slopes and uneven ground, the site would be made less attractive to motorcyclists.

5 LANDSCAPE EFFECTS AND VISUAL IMPACTS

5.1 Background

- 5.1.1 An assessment was carried out by a Landscape Architect from Richards, Moorehead & Laing Ltd to evaluate the effect of the restoration of former sand and gravel workings off Park Road in Cefn-y-Bedd, north west of Wrexham. The proposal site currently has no defined use. This report describes the existing landscape and predicted visual impact, comparing the existing situation with what is proposed during the works and on completion of restoration.

5.2 Method of landscape assessment

Guidance

- 5.2.1 The method of assessment is based broadly on the ‘Landscape Assessment Guidance’ published by the Countryside Commission, and the ‘Guidelines for Landscape and Visual Impact Assessment’ published jointly by The Landscape Institute and the Institute of Environmental Assessment. These guidelines were produced to assist in predicting the significance of effects that new developments could have upon landscape character, quality and visual amenity. The assessment is carried out in two parts:

- To assess the impact of change upon the landscape
- To assess the effect on views from viewpoints.

The landscape classification and evaluation

- 5.2.2 The impact on the landscape is assessed in terms of the disruption or change caused to the surface of the land, to the pattern of vegetation and field boundaries, and to any features of significant historic or cultural value. The change is measured against the existing landscape quality and character, which has to take account of existing features that may contribute to, or be damaging to, the landscape.
- 5.2.3 The landscape of the site and surroundings is classified into types that possess particular topography such as ‘limestone upland’, or ‘flood plain’. These areas are

mapped and given a suitable title for reference purposes. These landscape types are then subdivided into Landscape Character Areas that possess a consistent and easily-described landscape character. Each character area is evaluated to determine the sensitivity of the landscape to change, disruption and loss of important features. The character areas are also given a quality rating based on:

- Any designation to protect character or biodiversity;
- Its rarity in the local context;
- Any particular or unique attributes.

5.2.4 The landscape classification and evaluation provides a contextual framework to guide the design of the development and any visual or environmental mitigation that is required.

5.3 Method of visual impact assessment

5.3.1 The method of visual impact is based on knowledge of the site and of the surrounding landscape. The areas of visibility and non-visibility are determined by computer software using Ordnance Survey digital height data. The output from the analysis is used to create a map showing a zone of theoretical visibility (ZTV). The analysis is based on topography alone and does not take into account any landscape objects such as trees, woodland or buildings etc. This represents the ‘worst case’, as it shows what the visibility of a development in the landscape would be if there were no visual barriers. The results of the visibility analysis are tested on the ground; site survey work establishes whether local conditions cause areas of theoretical visibility to become areas of actual visibility or not. The ZTV analysis for the existing circumstances and circumstances after restoration are shown in Figures 3 and 4 within Appendix 5A.

5.3.2 Site surveys were carried out during weather that gives reasonable to good visibility, to establish the degree of inter-visibility of the site and local viewpoints. The results of the visual survey are recorded on the Visual Impact Plan (Appendix 5A / Figure 5), and the tested limit of visibility (the visual envelope) is shown. All relevant viewpoints within the limit of visibility are identified. Some viewpoints outside the

visual envelope were assessed to check that the limits are correctly defined. Photographs taken to represent principal viewpoints are presented in Appendix 5B. Results of the assessment are recorded in the Visual Impact Schedules, (Appendix 5C).

- 5.3.3 The degree of visibility of the proposal site from relevant viewpoints such as houses, public buildings, and roads, footpaths, public open space or prominent viewpoints was defined as part of the assessment. Each viewpoint was given a statement such as ‘no view’, ‘slight view’ or ‘significant view’. The definition of each of these statements is given in Table 8A. When a particular view of the development is noted as being significant a description of the view is given and, where appropriate, a representative photograph from the viewpoint is taken.

Table 8 Definition of terms used in visual impact assessment and visual impact schedules.

(A). EXISTING CIRCUMSTANCES

Term Used	Definition
No view	The existing site cannot be seen from the viewpoint
Distant view	The existing site can be seen from a distance greater than 1 km
Slight view	A small part of the existing site can be seen from less than 2 km
Significant view	A large part of the existing site can be seen from less than 2 km
Severe view	The existing site can be seen in full from a distance less than 2 km

(B). CHANGE IN THE DEGREE OF IMPACT

Term Used	Definition
Substantially detrimental	All or the majority of the proposed restoration works are visible from a distance of less than 1 km
Moderately detrimental	A part or peripheral elements of the proposed restoration works are visible from less than 1 km
Slightly detrimental	All of the proposed restoration works are visible from more than 1 km, or a part of the peripheral elements are visible from more than 500 m
No change	There is no change or a barely noticeable change in the view
Slightly beneficial	A small decrease in the visibility of the existing site or the proposed restoration works
Moderately beneficial	A large decrease in the visibility of the existing site or the proposed restoration works

Substantially
beneficial

Views of the existing site, the proposed restoration works will completely or almost completely be removed

5.3.4 The proposal for the restoration to the former mineral workings will involve a change to the landscape and so the visual impact of the change on local viewpoints, either beneficial or detrimental, is assessed as a change to the existing circumstances. For example, this might include a statement in the visual impact schedules such as ‘substantially detrimental’ or ‘slightly beneficial’. Definitions of each of these statements are given in Table 1B.

5.3.5 The visual impact schedules include a series of assessments for two stages in the life of the proposed works, selected to demonstrate the existing situation and the effect that restoration will have on the viewpoints.

5.4 The landscape evaluation

The setting

5.4.1 The community of Cefn-y-Bedd is located approximately four miles north of Wrexham and seven miles south east of Mold. It is situated on the A541 road linking Wrexham and Mold, and on the Borderlands railway line linking Wrexham with Bidston on the Wirral peninsula. The River Alyn flows southward to the east of the village. These are illustrated on Figure 1 – Landscape Setting in Appendix 5A.

5.4.2 The proposal site, at around 75 m above sea level, is part of the glacial and fluvioglacial sand and gravel deposits of the Wrexham Delta Terrace. The surrounding area is predominately agricultural, mixed with commercial/industrial estates developed on old mineral extraction sites. To the west are the narrow wooded River Alyn valley and an earth bank that forms the remains of Wat’s Dyke. To the north of the proposal site the area is dominated by gently-rolling arable farmland. To the east and south, the former mineral workings have been restored to pasture land.

LandMap

5.4.3 LandMap provides a consistent framework for collection of landscape information throughout Wales and is curated by the Countryside Council for Wales (CCW). Within LandMap, landscape character information is held in the Visual and Sensory fields. These identify one aspect area (similar to landscape character areas) covering the proposal site and its environs (as shown in Figure 2, Appendix 5A). Photographs taken to represent principal viewpoints from Landscape Aspect Areas are presented in Appendix 5B.

5.4.4 The proposal site lies within the ‘Terrace North & East of Wrexham’ aspect area (reference code WRXHMS057), the summary description for which is:

‘The area is characterised by a clearly defined and well maintained arable farming landscape with narrow lanes, roadside and field ditches and ponds. Topography is typified by undulating farmland on easily-worked sandy soils developed on "Wrexham Delta Terrace", a post glacial feature. The area generally rises from the Dee Terraces to the west to the escarpment peak between Llay & Marford to the north and Cefn Park to the east of Wrexham. The escarpment is most pronounced at Marford where it is most clearly defined. Horsely Hall is a significant historic parkland in the area and is on Cadw Register, grade II. Sensory perceptions include tranquillity, peacefulness, an efficient and industrious farming landscape, settled. Settlements are typified by traditional red brick buildings and are often small to moderate in scale and size. Sense of height at top of escarpment, with long views to mid-Cheshire ridge and Mersey estuary. Settlements at and around Wrexham to the south and east are evident, especially in terms of night time light pollution on the southern half of the aspect area.’

5.4.5 The land immediately to the west and north of the proposal site lies within the ‘River Alyn Wooded Valley’ aspect area (reference code WRXHMS069), the summary description for which is:

‘The aspect area is a very clearly defined narrow winding river valley complex with a very strong wooded vegetation cover containing the lower reaches of the River Alyn. The river follows a meandering course incised into the undulating plateau

area of the adjacent Wrexham Delta Terrace with which it shares a strong physical relationship. The A483 north of Wrexham follows the valley course providing an attractive entrance to the settlement. The land use is mixed with one section within Alyn Waters Country Park, whilst to the north west there are industrial uses. Generally the area comprises mixed woodlands with small and intimate field parcels in open areas. Public access is good throughout the area and the valley forms an important green space and link for the adjacent communities.'

- 5.4.6 The narrow wooded valley crosses the Wrexham and Flintshire county boundary very near to the proposed restoration site. In Flintshire the aspect area is named 'Llanfynydd Narrow Valley' (reference code FLNTVS074), the summary description for which is:

'Llanfynydd and Hope valleys - Narrow sinuous wooded valleys with very steep slopes in parts and a narrow flat valley floor. The area feels intimate and enclosed. There is some pastoral farmland in small fields and riparian vegetation. Small rural villages cluster just above the valley floor and there is also scattered settlement. There are isolated areas of derelict early industrial development which are now overgrown. There are stretches where there is limited access and the area is very tranquil although other areas have minor roads on the valley floor. There are attractive views to the upper valley sides and tops.'

5.5 The landscape assessment

Description of the existing situation

- 5.5.1 The proposal site is approximately 3.0 ha in extent. Previous extraction of sand and gravel minerals has left steep slopes to the northern and western sides, next to the grounds of Gwastad Hall Nursing Home, The Coach House and Lane End Cottage. Since mineral extraction ceased over 20 years ago, colliery spoil was imported and tipped, forming a central plateau running from the eastern boundary with Park Road towards the centre of the site. The edges of the plateau have been left as tipped, creating steep banks to the north, west and south. In between the steep slopes left from mineral extraction and the steep banks left from tipping of spoil, lies the floor of the former sand and gravel workings. The resulting landform is a flat-bottomed

‘C’ shaped valley with steep sides. Vegetation naturally established on the banks of the tipped colliery spoil separate the site into the plateau and the valley sections.

5.5.2 The proposal site occupies part of a larger area, south of the B5102 Llay Road, from which sand and gravel has previously been worked. The former sand and gravel workings to the east and south of the proposal site have since been restored to agricultural (pasture) use, and a lake that lies to the east of Park Road.

5.5.3 To the west of the proposal site sit the narrow wooded Alyn Valley and the remains of the ancient earthwork Wat’s Dyke. The mixed deciduous woodland forms a visual barrier between the proposal site and the village of Cefn-y-Bedd.

Restoration

5.5.4 The restoration proposal is described in detail in Section 2 of this supporting statement.

5.5.5 The proposed final restoration of the former sand and gravel workings is shown on planning application drawing 2909/03, and the proposed sequence of restoration is shown on drawing 2909/05.

5.6 The visual impact assessment

Visual surveys

5.6.1 Visual surveys of the site and surrounding landscape were carried out on 13th October 2010. The Visual Impact Schedules are set out in Appendix 5C. Principal viewpoints within the study area were also identified during the site visit. Photographs taken to represent the principal viewpoints can be found in Appendix 5B: these views are described in the following paragraphs.

View A – from Bryn-Yorkin Road

5.6.2 From this location, the viewer is directed towards Llay Tips and Llay Industrial Estate, the broad undulating farmland between the rivers Alyn and Dee north of Wrexham and the narrow wooded valleys of Llanfynydd and Alyn. Views of the proposal site are screened by the Alyn Valley Woodland.

- 5.6.3 At this range it would be difficult to distinguish the vegetation lost along Park Road from the woodland in front of it in the representative view. The columnar Poplar trees in the grounds of Gwastad Hall are useful landmarks to help determine the location of the proposal site from long distance.

View B – from Sydalit Lane at the intersection with Windy Hill

- 5.6.4 From this location, the viewer is directed towards Llay Tips and Llay Industrial Estate and the arable farmland between Llay and Cefn-y-Bedd. Views of the proposal site are limited to the hedgerow boundary alongside Park Road. The removal of trees to allow access into proposal site would be noticeable, but would not detract from the broader view towards Llay.

View C – from Mold Road in Cefn-y-Bedd

- 5.6.5 Views toward the proposal site are completely interrupted by the Alyn Valley Woodland.

View D – from Llay Bank

- 5.6.6 The representative view is from the point at which the public footpath crosses the boundary fence, between the two aspect areas ‘River Alyn Wooded Valley’ and ‘Terrace North and East of Wrexham’. The Grange and Gwastad Hall to the north of the proposal site are visible, and show its eastern and western limits. Some of the self-sown vegetation growing on the tipped colliery spoil is the only visible feature of the proposal site. Their loss from the view would barely be noticeable.

View E – from Llay Road (near to Allandale and Bryn Euryn)

- 5.6.7 Trees which would be removed to allow vehicular access into the proposal site are clearly visible. Their loss would allow views of the restoration work in progress. Their outline in the representative view would be replaced by woodland in the Alyn Valley. Views into most of the site would continue to be screened by vegetation along Park Road, to be retained. Some of the self-sown vegetation within the site that would be removed for restoration would also be lost from the view. This would be replaced in the view by Alyn Valley Woodland and the change in view would be a

barely noticeable one. Lorries entering the proposal site from Park Road would be visible during the proposed restoration works.

View F – from Alyn Waters Country Park

- 5.6.8 From the country park, views northward are directed towards Hope Mountain and Caergwrle Slopes. Remnants of the previous industrial uses of the Alyn Valley are visible. The current industrial uses within the valley are completely screened from view by the woodland, as is the proposal site. The recently-planted woodland within the country park will increase the amount of screening over time.

View G – from Public Footpath Llay 12 (Llay Hall Farmland)

- 5.6.9 From this location, the viewer is directed towards Hope Mountain and Caergwrle Slopes. Views of settlements along the A541 are interrupted by the Alyn Valley Woodland. The Grange bungalow is the more visible of the dwellings in the photograph. Lane End is partially screened by a hedgerow. Also visible are high-sided vehicles using Park Road. A couple of small trees would be removed to allow vehicular access into the site from Park Road. The loss of these trees may allow glimpses into the proposal site during restoration, but would not cause a break in outline of the visible woodland. Upon completion of the restoration, the landform would resemble the undulating farmland such as that visible in the foreground.

View H – from Llay Road (near entrance to Llay Quarry)

- 5.6.10 From this location, the viewer is directed towards the rolling farmland of Cymau and Windy Hill, west of Sydalit. Although interrupted in the representative viewpoint, Hope Mountain and Caergwrle Slopes are visible from other sections of the road and from the colliery spoil tips. Views of settlements along the A541 are interrupted by Alyn Valley Woodland. Views of the proposal site are interrupted by hedgerows with mature trees in the open rolling lowland between Llay and Cefn-y-Bedd. Views of the proposal site are theoretically possible from the higher levels of the colliery tips, although the tips themselves are not noticeable from the proposal site on a day with normal visibility.

5.7 Impact of change upon the landscape

- 5.7.1 The proposal site is of a small scale relative to the aspect area within which it lies. It is contained by woodland and undulating topography, and sits alongside other former sand and gravel workings previously restored to agriculture. The proposed landform design is intended to retain as much of the character of the proposal site in its existing condition and fit in well with the surrounding agricultural landscape..
- 5.7.2 The proposed restoration would create a gently-domed landform for agricultural use, retaining some of the steep slopes that form the northern and western boundaries but the importation of restoration material would halve their overall height in places.
- 5.7.3 The steep bank to the west would be retained, reinforcing the boundary with the Alyn Valley Woodland and Wat's Dyke. The hidden valley to the north and west of the colliery spoil would be filled in. The resulting domed landform should remove the attractiveness of the site for activities such as motorcycling and shooting.
- 5.7.4 Creating the landform would result in the loss of self-sown trees and shrubs within parts of the proposal site to be restored to agriculture. Vegetation around the boundary of the site would be retained to screen the restoration works where possible. Where vehicular access to the site from Park Road is needed, and where trees would be unable to survive due to the addition of soils and compacted restoration materials over their root plate, they would be removed.
- 5.7.5 The shape of the land would direct surface water towards the southern boundary of the site to create a seasonal wetland area proposed for nature conservation. This would be enhanced and managed to increase its biodiversity.
- 5.7.6 It is considered that the proposed restoration would not adversely affect the established landscape character of the area.

5.8 Effect on views from viewpoints

- 5.8.1 During normal conditions of moderate to good visibility, such as those when the visual survey was completed, the proposal site and its features are not readily visible from the surrounding landscape west of the River Alyn Wooded Valley.

- 5.8.2 The majority of the viewpoints within the visual envelope, to the east of the Alyn Wooded Valley, have filtered views of the proposal site. The features within the site are not readily discernible as being different from the surrounding landscape. The exceptions are two properties that overlook and share a boundary with the proposal site, namely ABC Day Nursery and Lane End.
- 5.8.3 It is proposed that these single storey buildings would be shielded from noise generated during restoration works with the construction of a timber noise attenuation fence at the boundary. This would stop up any views of the proposal site and activities whilst restoration is in progress.
- 5.8.4 Once the restoration has been completed, and the noise barriers removed, the views would be wider and longer in a direction towards Llay Bank and the Alyn Waters Country Park.
- 5.8.5 The restoration works in progress would have a negative visual impact on the two properties currently overlooking the proposal site. The visual impact would reduce to a neutral or positive one once the restoration works have been completed and the noise attenuation fence has been removed.

6 ECOLOGY AND NATURE CONSERVATION

6.1 Introduction

- 6.1.1 To assess the likely effects of the proposed restoration of the site, a series of desk-top and site investigations were undertaken throughout 2010. The data collection method followed the general guidance provided by the Institute of Ecology and Environmental Management (IEEM) in the Ecological Impact Assessment Guidelines (EcIA). Information about the site has been gathered through a graduated series of surveys and searches which have highlighted the key ecological issues concerning the proposals.
- 6.1.2 Three levels of survey were used to establish the ecological baseline for the site:

- a desktop search,
- a phase one extended habitat survey
- a detailed species survey.

6.1.3 The methods used to gain the required information are described in more detail in the Ecology Report¹. The surveyors were all appropriately experienced and licensed to undertake habitat surveys and surveys for protected species as required.

6.2 Summary of survey methods

Desktop search

6.2.1 A ‘desk-top’ search for protected species and sites within 1km radius of the site centred on NGR SJ 3146 5578 was conducted, using COFNOD. COFNOD is one of the four Local Record Centres in Wales, and holds the largest number of records for biodiversity and geo-diversity information in North Wales. The results of this enabled surveys to focus upon specific species and habitats or particular relevance to the project.

Phase 1 extended survey

6.2.2 A Phase 1 extended survey of the site was undertaken on 6th May 2010 to ascertain the ecological value, to identify habitat types which have the potential to support protected species, to record any evidence of protected species and to establish which further detailed surveys needed to be undertaken. The survey recorded the general vegetation, making a list of vascular plant species. Other features of wildlife interest were recorded, and protected species potential was noted.

6.2.3 The extent of the survey is shown in the Phase 1 plan and target notes, which were produced in the abbreviated form (Appendix 6A). Where required, photographs of habitats and species were taken for reference purposes. A selection are presented in Appendix 6B; all are presented in the Ecology Report.

¹ Park Road, Cefn y Bedd Ecological Report October 2010. Richards, Moorehead & Laing Ltd Ref 2909/11

Detailed ecological surveys

6.2.4 The following surveys, shown by the desk-top and Phase 1 work to be needed, were undertaken between May and September 2010:

- Great Crested Newt (*Triturus cristatus*)
- Bat species (*vesper* and *Rhinolophidae* species)
- Reptiles (Adder (*Vipera berus*), Slow worm (*Anguis fragillis*), Grass snake (*Natrix natrix*), Common Lizard (*Zootoca vivipara*)
- Badger (*Meles meles*)
- Otter (*Lutra lutra*)
- Ornithological survey
- *Lepidoptera* survey
- A full National Vegetation Classification (NVC) survey

6.2.5 In addition, an assessment of the site against the local and national bio-diversity action plan species (BAP and LBAP species) and the Section 42 ‘Welsh species and habitats of principal importance’ (as listed in the Natural Environment and Rural Communities Act (NERC Act)) was made. Planning guidance publication Technical Advice Note 5 recommends that these species are taken into account (in addition to those protected by U.K and European legislation) as a material consideration in the planning process.

6.2.6 An arboricultural survey was undertaken in conjunction with the botanical survey. This incorporated a subjective assessment of the abundance of each tree and shrub species using the DAFOR scale. All trees were categorised according to the tree quality assessment guidelines contained in BS5837: 2005; and recommendations for impact mitigation were made.

6.3 Results of ecological investigations

Desktop and Phase 1 habitat survey

6.3.1 The desktop search identified a variety of sites, areas and species within 1km of the site's centre at NGR SJ3146 5578. The site was not found to have any statutory (eg SSSI, LNR) or non-statutory (e.g. county wildlife site) designations. There were two designated sites intersecting the 1000m buffer zone: Llay Bog SSSI (636m from Park Road) and Alyn Waters Local Nature Reserve (702m).

6.3.2 Six non-statutory wildlife sites were identified, as listed in Table 9.

Table 9 Wildlife sites within 1000m of proposal

Wildlife Sites	Distance from site centre
Sydalt Wood	431m
Alyn Waters wildlife site	85m
Blast Road Pond	136m
Rhydlyn Hall Grassland - candidate site	906m
Hope Mountain and Ffrwd Wood– candidate site	702m
Caeau Abermorddu – candidate site	945m

6.3.3 A full list of public records from COFNOD is presented in the Ecology Report. Category 1 species with European and UK Legal Protection, Section 42 (NERC) Species and UK BAP Priority Species recorded within 1km of the site centre are listed in Table 10. The habitats found within the site boundary are shown in the Phase 1 plan and target notes, presented in Appendix 6A.

Table 10 Category 1 species within 1000m of proposal

Category 1 Species
Otter (<i>Lutra lutra</i>)
Water Vole (<i>Arvicola terrestris</i>)
Bats (chiroptera) including myotis; common pipistrelle, brown long-eared and soprano pipistrelle.
Great Crested Newt (<i>Triturus cristatus</i>)
Grass snake (<i>Natrix natrix</i>)

Category 1 Species
Badger (<i>Meles meles</i>)
Grayling (<i>Hipparchia semele</i>)
Cinnabar moth (<i>Tyria jacobaeae</i>)
Dusky-lemon Sallow Moth (<i>Xanthia gilvago</i>)
White-letter Hairstreak butterfly (<i>Satyrrium w-album</i>)
Polecat (<i>Mustela putorius</i>)
Common toad (<i>Bufo bufo</i>)

Walkover Assessment for Protected or important Species

- 6.3.4 The walkover, carried out as described in paragraph 6.2.2, showed no evidence of badgers. A fox earth was discovered on the site, with feeding remains such as rabbit, crow and eggs. Fox scats (faeces) were also present. A fox was spotted twice during the survey and fox prints were found at the den entrance and near rabbit burrow entrances. There were several rabbit burrows on the site, with rabbit droppings and rabbit prints.
- 6.3.5 During the walkover the suitability of trees as bat roosts was assessed by a licensed bat worker. The trees are relatively young (20 – 30 years) and have no cracks or hollows in them. It is considered very unlikely that bats will be roosting within these trees or the scrub present on the site. The site is bordered by older trees which appeared more suitable as roosting sites. It is very likely that bats use much of the site for foraging and potentially as a corridor to reach insect hatches.
- 6.3.6 Dingy Skipper (*Erynnis tages*) is known to be present in sites throughout Wrexham. This species' larval food plant (Bird's-foot-trefoil, *Lotus corniculatus*) is present on the site. The site also provides patches of bare ground in sheltered conditions which are ideal for this species. Ragwort (*Senecio jacobaea*), the larval food plant of Cinnabar moth (*Tyria jacobaeae*) is present on the site alongside suitable sunny habitat.
- 6.3.7 No evidence of Polecat was found during the survey. The species is listed as a UK Biodiversity Action Plan Species and has been recorded within 1km of the site. No

Polecat dens were identified, but they can use any suitable holes such as fox earths or rabbit burrows which are present on the site. The site is likely to support a large number of small mammal species such as Bank and Field Voles, making it good foraging habitat for Barn Owl (*Tyto alba*) and Kestrel (*Falco tinnunculus*).

Water voles

- 6.3.8 The site was unsuitable for water voles as the drainage ditches did not retain water. The ponds on the site were searched for evidence of water voles and there were no signs of use. Water voles usually prefer waterbodies which retain a water level of approximately 0.5 metres or more, whereas the ponds are likely to be seasonal, drying up during the summer months. No further surveys for this species at this site were considered necessary. The walkover survey did find indications that the site was suitable or in use by other protected species listed in 6.2.2, and so further specific survey was carried out to establish the presence and population size or frequency.

Otters

- 6.3.9 An otter spraint was found 30 metres from the boundary of the site, alongside a small drainage discharge leading to the River Alyn at grid reference SJ3132 5581. The river is known to be used by otters. A specific search for evidence of otters was undertaken on 23rd August to identify whether the site is being used as a resting place. No such evidence (holts or ‘couches’) was found although 3 further spraints were observed.

Great Crested Newts

- 6.3.10 Good amphibian habitat, including two ponds, is present on the site and further ponds are present in the surrounding area. One pond has an abundance of vegetation suitable for egg laying, but the other has dense algae which was considered less unsuitable. Both ponds were shallow and water levels had receded, suggesting they may dry up completely later in the summer. This is beneficial for newts as it excludes the presence of fish which can predate amphibian eggs and larvae. Adjacent areas of woodland, scrub, species-rich hedgerow and rough grassland

provide suitable terrestrial habitat for newts to forage for invertebrates. The woodland areas, scrub and hedgerows would make ideal hibernation sites.

- 6.3.11 Within 500m of the site there are four further ponds. One large pond, locally called ‘The Leak’, is considered unlikely to be used by Great Crested Newts (‘GCNs’). GCNs will swim in open water and so the young (efts) are vulnerable to predation by fish. During the walkover a number of carp over 30cm in length were observed in this pond. The other three ponds present are considered to be in poor condition (very overgrown) but suitable for GCN. Full surveys for newts were therefore conducted at the ponds 1 – 6 shown in the plan (Appendix 6C), and the results are shown in Table 11.

Table 11 Great Crested Newt survey results

Date	Temp. °C	Method	Pond	Result	Notes
12/05	9.5	T, N, B, E	1 to 6	Pond 6: 40GCN 31 S/P	No newts observed in any other ponds. Both smooth and palmate newts present.
13/05	9.0	T, N, B	1 to 6	Pond 6: 43 GCN 27 S/P	No newts observed in any other ponds.
18/05	10.0	T, N, B	1 to 6	Pond 6: 56 GCN 32 S/P	No newts observed in any other ponds.
19/05	12.0	T, N, B, E	1-4 and 6	Pond 2: 3 GCN Pond 6: 44 GCN 29 S/P	Pond 5 completely dry.
20/05	11.5	T	2,6	Pond 6: 37 GCN 31 S/P	
25/05	20.0	T	2,6	Pond 6: 37 GCN 31 S/P	
27/05	15.0	T	6	Pond 6 26 GCN 29 S/P	Pond 2 now dry

T – torch survey, **N**, net survey, **B** – bottle trap **E** – egg search.

- 6.3.12 The table shows a peak count of 56 GCN was recorded using pond 6 (within the site), and 3 GCN were recorded in pond 2 (north-east of the site). Three different species of newt were recorded (Great Crested, Smooth and Palmate). Based upon the guidelines set out in English Nature (2001), pond 6 is classed as holding a medium-sized population (a maximum count of between 11 and 100), where as pond 2 holds a small population (between 1 and 10) of Great Crested Newts.

- 6.3.13 The difference in the newt populations of these ponds can be explained by the quality of the habitat. Pond 6 (on site) is high-quality newt habitat. The pond has a good assemblage of submerged plants and the invertebrate density is high. Shade around the pond is minimal and as the pond dries out in the late summer, no fish are present. No waterfowl were recorded.
- 6.3.14 Pond 2 was less suitable for newts. The water was silty and shallow, with limited emergent vegetation and few invertebrates. The pond was also heavily shaded by overgrown trees surrounding the entire pond. The pond was in an early stage of succession and is unlikely to remain as a pond for many years. Ponds 1 and 3 were in a similar condition which may account for the absence of newts. Pond 4 ('The Leak') is unsuitable for Great Crested Newts because of the large number of fish present.
- 6.3.15 It is likely that in the past the ponds 1, 2, 3, 5 and 6 formed the breeding sites for a meta-population of newts. As the quality of the habitat in ponds 1, 2 and 3 has declined the newts breeding at these ponds have either reduced in number or moved to ponds 5 and 6 where there is also abundant suitable terrestrial habitat. This makes the ponds present on site particularly important as they are the only suitable Great Crested Newt breeding site within 500m.

Reptiles

- 6.3.16 The site consists of a mosaic of different habitat types including hedgerows, areas of exposed soil and gravel, areas where rubble has been fly-tipped, rough grassland, ponds, wooded areas and hedgerows which are all suitable habitats for reptiles to forage, bask and hibernate. Part of the site is south facing. Reptiles which are found in such habitats include slow-worms, grass snake and common lizards. Specific reptile surveys were therefore carried out to determine the presence or absence of reptile species.
- 6.3.17 Seven surveys were undertaken, during ideal weather conditions of intermittent cloud and no heavy precipitation, on dates shown in Table 12. Surveys were spread across the active season for reptiles, but avoiding July and August when the weather conditions are too hot. No reptiles were observed using the site. No major

limitations were encountered during the surveys. Although the refugia were largely left un-touched by the public, reptiles are shy animals and disturbance by dog walkers before the survey visits may have affected results on some occasions. It is unlikely that this occurred before every survey visit, and as reptiles often return to the same basking spot following minor disturbances the results are considered a reliable indication that no reptiles are present.

Table 12 Reptile survey visits

Survey	Date	Temp °C	Result
1	26/5	12	Nil
2	4/6	10	Nil
3	11/6	14	Nil
4	18/6	12	Nil
5	25/6	10	Nil
6	30/6	13.5	Nil
7	2/9	12	Nil

All surveys conducted 0700 – 0800 hrs

Badger

- 6.3.18 Surveys for badgers were undertaken on the 6th, 18th and 26th of May. No evidence of use of the site by badgers was observed, although badgers are known to be present in the locality. It is not considered that the site is used for foraging, and no setts were observed during the walkover surveys. The predominant ground substrates (colliery spoil and gravel) are not good habitat for earthworms, which are usually the primary food source for badgers. It is possible that fox dens on site may be enlarged and used by badgers at any time, and so despite the lack of badger field signs, update surveys will be required before earthworks commence.

Bat flight line and foraging surveys

- 6.3.19 A flight line and foraging survey was undertaken on the 4th August 2010. The survey highlighted the use of the scrub by the following bat species: Soprano Pipistrelle,

Common Pipistrelle, Brown Long-eared, Daubentons bat and Noctule. There appeared to be no definite commuting lines across the site. The largest amount of bat foraging activity was recorded over the wetland area of the site, with up to five individuals foraging at one point. Other areas of the site were used much less frequently. The late appearance of the bats indicates that their roosting site is not close to the site.

6.3.20 On the night of the survey the sun set was at approximately 2100hrs. The surveyors were in position by 2000hrs. The first pass by a Pipistrelle bat was recorded at 2036hrs. Between 2036 and 2215hrs, intense foraging by Daubenton's and both Pipistrelle species was observed over the wetland area at the southern end of the site. Foraging by these species reduced in intensity after 2215, but bats remained foraging until the survey finished at 2230hrs.

6.3.21 Brown Long-eared bats were observed 'gleaning' (feeding) in and around the areas of scrub and tree stands on the site. Although recorded throughout the site, this species seemed to have a preference for the southern end of the site close to the water. A single Noctule bat was recorded commuting south over the site at 2155hrs. This species was not using the site for foraging but simply passing over the area.

Breeding and nesting birds

6.3.22 The local habitats, particularly the broadleaved woodland forming the western boundary of the site, the scrub, hedgerows and areas of rough grassland provide suitable conditions for nesting and breeding birds. The surrounding habitat is mainly agricultural and is likely to be in use by farmland birds. The scrub and woodland elements of the site are considered to be excellent nesting habitat for a wide range of bird species.

6.3.23 The breeding bird survey recorded the species listed in Table 13 as being present on or close to the site.

Table 13 Birds observed on site

Common name	Scientific name	Common name	Scientific name
Blackbird	<i>Turdus merula</i>	Jay	<i>Garrulus glandarius</i>
Black cap	<i>Sylvia atricapilla</i>	Lapwing*	<i>Vanellus vanellus</i>
Blue Tit	<i>Cyanistes caeruleus</i>	Long tailed tit	<i>Ageithalos caudatus</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>	Magpie	<i>Pica pica</i>
Buzzard*	<i>Buteo buteo</i>	Robin	<i>Erithacus rubecula</i>
Carrion Crow	<i>Corvus corone</i>	Snipe	<i>Gallinago gallinago</i>
Chiffchaff	<i>Phylloscopus collybita</i>	Song thrush	<i>Turdus philomelos</i>
Coal Tit	<i>Periparus aster</i>	Swallow	<i>Hirundo rustica</i>
Dunnock	<i>Prunella modularis</i>	Willow warbler	<i>Phylloscopus trochilus</i>

An asterisk marks those species which were not present on the site but were using habitat within 100m of the site.

6.3.24 Snipe were regularly recorded using the wetland area at the southern end of the site. Lapwing were recorded using the adjacent farmland, where they were seen and heard displaying. Two summer migrants, Chiffchaff and Black Cap, were breeding or probably breeding on the site. These species regularly frequented the scrub habitat, predominantly towards the southern end of the site.

Botanical survey

6.3.25 The findings of the National Vegetation Classification survey, with a list of all vascular plant species recorded and a site plan, are presented in Appendix 6D. The NVC communities mapped on the site include:

- A20: *Ranunculus peltatus* aquatic community;
- MG1a & e: *Arrhenatherum elatius* grassland (a mosaic of the *Festuca rubra* and *Centaurea nigra* sub-communities);
- MG5a: *Cynosurus cristatus*-*Centaurea nigra* grassland (*Lathyrus pratensis* sub-community) (degraded in places by rabbit grazing and motorbike traffic);
- MG10b: *Holcus lanatus*-*Juncus effusus* rush-pasture (*Juncus inflexus* sub-community);

- MG13: *Agrostis stolonifera*-*Alopecurus geniculatus* grassland;
- W8f: *Fraxinus excelsior*-*Acer campestre*-*Mercurialis perennis* woodland (*Allium ursinum* sub-community);
- W21a: *Crataegus monogyna*-*Hedera helix* scrub (*Hedera helix*-*Urtica dioica* sub-community), and;
- W24a: *Rubus fruticosus*-*Holcus lanatus* underscrub (*Cirsium arvense*-*Cirsium vulgare* sub-community).

6.3.26 The highly-invasive non-native species Japanese knotweed (*Fallopia japonica*) was also recorded on the site, on the boundaries with Park Road and Lane End.

Arboricultural survey

- 6.3.27 Significant individual trees were observed within the woodland and scrub habitats. Abundance is shown according to the DAFOR scale (**D**ominant; **A**bundant; **F**requent; **O**ccasional; **R**are).
- 6.3.28 Woody species within the W8f woodland include: *Ulmus glabra* (A), *Fraxinus excelsior* (F), *Acer pseudoplatanus* (O), *Prunus avium* (R), *Quercus petraea* (R) and *Salix caprea* (R). One or two specimens of the following were found in the north-west corner of the site, in close proximity to the dwelling, and are assumed to have been planted: *Buxus sempervirens*, *Ilex* cv., *Laburnum anagyroides*, *Pinus sylvestris*, *Prunus cerasifera* var. *pissardii*, *Prunus laurocerasus*, *Ribes nigrum*, *R. Uva-crispa*, *Syringa vulgaris* and *Taxus baccata* (*sensu stricto* and cv. *fastigiata*).
- 6.3.29 This community is, in effect, a recent extension of the adjacent mature woodland of the same NVC type which is situated off the site to the west. At present, only the more mobile tree and shrub species of the community have become established on this east-facing slope to any great extent; the field and ground layer vegetation will take longer to encroach.
- 6.3.30 Woody species within the W21a scrub habitat include: *Crataegus monogyna* (F), *Rosa canina* (F), *Corylus avellana* (O), *Ulex europaeus* (O), *Acer pseudoplatanus* (R), *Betula pubescens* (R), *Fraxinus excelsior* (R), *Prunus avium* (R), *Quercus petraea* (R) and *Sambucus nigra* (R). All of the trees included in this community are young, naturally-regenerated, commonly-occurring pioneer species and, as such, are

assigned to Category C, this is the lowest category class of tree. The trees present on the site mostly have a stem diameter of less than 150mm, are of no special arboricultural value, are of relatively low landscape value and have limited conservation and cultural value.

6.4 Assessment of impacts and mitigation required

- 6.4.1 The impact of the proposed works, and suitable measures to avoid or mitigate that impact, were considered in relation to the results of the ecological investigations. Where specific mitigation within the works is required, this is stated.

Walkover Assessment for Protected or important Species

- 6.4.2 The restoration of the site to lowland meadow and wetland will provide good conditions for the small mammals hunted by Barn Owl and Kestrel. The temporary loss of these conditions, and disturbance during active working hours, will be of low significance given other areas of farmland in the surroundings.
- 6.4.3 The reinstatement of the habitat as lowland meadow will provide habitat for a wide range of invertebrate species including the Dingy Skipper whose larval food plant will be prolific in the lowland meadow habitat. Ragwort is likely to be present in the field and hedgerow margins of the district and so any impact upon the Cinnabar moth will be minimal.

Water voles

- 6.4.4 The proposed works would have no impact on water voles as none are present.

Otters

- 6.4.5 The proposed works would have no impact on otters, as the river corridor would not be disturbed and otters do not lay up or shelter in the vicinity of the works. There would be no working at night, which is when otters are most active.

Great Crested Newts

- 6.4.6 The proposal site contains the breeding site of a medium sized population of Great Crested Newts. The proposed works recognise that if this pond was to be lost the

Great Crested Newt Mitigation Guidelines (Natural England, 2001) would class this as a high level impact. The proposals also recognise that the loss or modified management of some immediate terrestrial habitat within 50m of the breeding ponds would be classed as a medium level impact by the guidelines. The impacts would be long term. Consequently the scheme has been designed to retain and improve these waterbodies, and to retain or recreate the terrestrial habitat which surrounds them. The hydrological effects of the proposals are described in section 10 of this statement. It is concluded that there would be minimal effect on the hydrology of the ponds within the site.

- 6.4.7 In order to undertake the works it will be necessary to apply to the Welsh Assembly Government for a derogation licence under Section 53 of “The Regulations”. For this licence to be granted, mitigation that will ensure that the population is maintained in a favourable conservation status must be implemented. Such a licence can only be issued after planning permission has been granted. A mitigation plan submitted as part of the licensing process is a detailed and lengthy document which will be developed from the mitigation strategy outlined in the following paragraphs.
- 6.4.8 A nature conservation area will be created on the site as shown in planning application drawing 2909-03. This area will contain and protect the wetland areas at the southern end of the site, and will extend to 5800m² (approximately one quarter of the site). The pond will be accessible to newts from the remainder of the site and from the adjacent land to the south and west. The habitat within the site will be improved for newts by the provision of log piles and stone hibernacula, and by the management of the vegetation. In addition, approximately 1600 m² of bank and hedgerow habitat surrounding the site will be retained.
- 6.4.9 The working area of the site will initially be enclosed with amphibian-proof fencing, to exclude the newts from the remainder of the site. The amphibian barrier will be installed inside the retained bank and hedgerow, allowing newts access to this habitat as well as easy dispersal routes around the site. Inside this exterior fencing a grid of newt-proof drift fencing should be installed. Carpet tiles and pitfall traps will be positioned in suitable locations throughout the exclusion area as outlined in the Great Crested Newt Mitigation Guidelines. The traps will be checked over the

recommended period of time, and any captured newts moved to the nature conservation area. Once the site is determined to be free of newts, disturbance work could begin.

6.4.10 As each part of the landforming and soil placement is completed, the land will be restored by sowing a diverse agricultural meadow, which is of value to Great Crested Newts as both foraging and dispersal habitat. The amphibian exclusion fencing will be removed at the completion of the restoration phase.

6.4.11 The meadow will be managed by a single late-summer cut to produce hay which would be baled and removed from site. Livestock (most likely cattle or sheep) will then be introduced to the meadow and the meadow grazed at a low density for a short period in the autumn. Management of the nature conservation area will be through low-density grazing at the same period, primarily to prevent succession of the wetland and to control scrub invasion. A separate gate will be installed to provide access from the meadow to this area, so that grazing intensity and duration can be independently managed.

6.4.12 Taking account of the proposed mitigation, the effects of the project may be summarised as:

- negative impact through excluding the newts from a small area of grassland and scrub for a temporary period
- newts will retain access to their breeding pond which will not be interfered with as part of the restoration project
- newts will retain access to surrounding habitat (predominantly farmland) for additional foraging, hibernation and dispersal
- the nature conservation area will be improved through the provision of additional hibernation sites
- The removal of motorcycle disturbance and development of meadow vegetation in currently-bare areas will improve the terrestrial habitat.

6.4.13 Following site restoration there will be an overall net gain in suitable newt habitat in addition to the improvements to the habitat in the nature conservation area. Based

upon the Great Crested Newt Mitigation Guidelines, the impact will be classed as low.

Reptiles

- 6.4.14 The site is subject to a high level of disturbance from the unauthorised use of off-road motorbikes and other activities (eg clay pigeon shooting, rabbit hunting, walking dogs, youths lighting fires and drinking alcohol) which would deter reptiles as they are shy animals. Unlike species such as amphibians which are able to maintain much of their life under cover of undergrowth, underground or in water bodies, reptiles need to bask in sunny areas. Regular disturbance is likely to deter basking, forcing the animals into other habitat. Although the habitat on the site is considered suitable, these species are not present because of regular disturbance.
- 6.4.15 As no reptiles were recorded on the site no negative impacts are anticipated. The proposed scheme would reduce or remove much of the current site disturbance, while retaining elements of suitable habitat for reptiles such as the south-facing banks and scattered scrub. It is therefore possible that reptiles will colonise the site following the restoration.

Badger

- 6.4.16 As no badger setts were encountered during the site survey work and because the site is classed as poor foraging habitat, no negative impacts are anticipated.

Bats

- 6.4.17 No trees or structures suitable for roosting bats are present on site, but the habitat is used by bats for foraging. The principal bat foraging habitat is associated with the wetland area to the south of the site, where insect prey are likely to be concentrated. A range of similar suitable habitat, including wetlands, is present in the locality and so the proposal site is not considered significant for the viability of the local bat population. However, the proposed scheme has been designed to retain the wetland and its adjacent habitat, to retain the mature tree belt along the western margin, to retain hedgerows and banks around the northern, eastern and southern boundaries, and to create a diverse grassland meadow which would also support a range of insect

prey species. During the working period approximately 40% of the habitat on the site will be retained. The remaining 60% will be reinstated to meadowland within approximately three years. No night time working is anticipated as part of the project, therefore there will be no disturbance to foraging bats during the works.

6.4.18 The proposed scheme is therefore considered neutral in its effect on bats.

Breeding and nesting birds

6.4.19 The habitat is suitable to provide nesting opportunity for a range of common wild birds. The following species, listed as Biodiversity Action plan species (BAP) or listed as Schedule 42 Species in the NERC Act (2006), were identified as being present on the site (or within 100m as marked by an asterisk):

- Bullfinch (*Pyrrhula pyrrhula*) (NERC, BAP)
- Lapwing (*Vanellus vanellus*)* (NERC, BAP)
- Dunnock (*Prunella modularis*) (NERC, BAP)
- Song Thrush (*Turdus philomelos*) (NERC, BAP)

6.4.20 The Lapwing and Song Thrush are ‘Red list’ species in the Birds of Conservation Concern (2009). Snipe, Dunnock and Willow Warbler, also recorded on the site, are ‘Amber list’ species in the same publication.

6.4.21 The proposed works would retain the highest quality ecological habitat on the site, including the boundary hedgerow habitat and 5800m² of open mosaic and wetland habitat. This habitat is suitable for nesting and breeding birds. Approximately 22,100m² of scrub mosaic habitat, used by breeding birds on the site, will be lost. This habitat is abundant in the locality; its loss would be considered a minor negative impact and is not likely to have any impact on the long term viability of these species. The Lapwings were recorded using adjacent habitat at some distance from the working site, and so it is not anticipated that there will be any impact on Lapwings, either from disturbance or habitat loss.

6.4.22 Lowland meadow is an important habitat for a range of notable bird species including Lapwing. Skylark and Meadow Pipit may also nest in correctly-managed meadows,

and Barn Owls and Kestrels will use lowland meadow for hunting. Once fenced and actively managed for agriculture and conservation, the habitat will be less disturbed by anti-social behaviour thereby increasing its value to breeding birds.

- 6.4.23 The proposed works will cause short term, minor negative impact through habitat loss and disturbance, but following reinstatement of the site a net gain of habitat suitable for wild birds is predicted.

Other vegetation

- 6.4.24 The site contains a number of habitats which are listed on the Wrexham local Biodiversity Action Plan: ‘open mosaic habitat’, ‘brownfield land’ and ‘freshwater ponds’. The last two habitat types are listed a priority habitats of the Wrexham Local Biodiversity Action Plan (LBAP). Open mosaic habitats are also listed in Section 42 of the NERC Act (2006) as a priority habitat.
- 6.4.25 None of the plant species identified during the botanical survey were classed as particularly rare, endangered or notable. The loss of some 2.2 ha of the scrub mosaic habitat would result in a minor negative impact. This area would be reinstated as lowland meadow which is an LBAP target habitat. The wetland/ponds would be retained within the nature conservation area (Drawing 2909-03) thereby avoiding negative impact on this habitat.
- 6.4.26 Following reinstatement the works will result in a net increase in the biodiversity value of the local area. The site will consist of four types of Wrexham LBAP target habitat including:
- Open mosaic habitat
 - Freshwater ponds
 - Hedgerow
 - Lowland meadow
- 6.4.27 With the implementation of mitigation the proposed works are predicted to have a short term, minor negative impact during construction with an overall net biodiversity gain following reinstatement of the site as lowland meadow.

- 6.4.28 No trees of any importance within the proposed works boundary were recorded in the site survey. None of the trees was rated higher than category C – at which any tree can be considered for removal. This is to be expected, since all trees within the area of former mineral extraction have self-sown since the cessation of disturbance in the 1960s and are therefore less than 50 years old. The proposed works would retain trees within the area for nature conservation and at the site boundary. Selected trees with a diameter at breast height (DBH) of less than 150mm would be considered for transplanting elsewhere on the site as appropriate.
- 6.4.29 The proposed infilling operations would not extend beyond the boundary of the former mineral extraction, and at the margin they would not raise the levels above that existing before extraction. To protect the more significant trees within the W8f category woodland further up the slope, a Root Protection Area would be plotted on the ground before works commenced. The maximum DBH of tree stems in the mapped area of W8f woodland is approximately 250mm, with the majority being much less than this. The RPA based on this diameter would extend up to 3m from the tree stems, and so a ‘buffer zone’ not less than 3m wide would be identified outside the margin of proposed site operations and marked on the ground. Woody vegetation including trees within this zone is, by definition, either post-mineral extraction or has withstood the disturbance caused by mineral extraction. This zone would be partly or completely cleared of vegetation sufficient to allow the erection of amphibian exclusion barrier as set out in para 6.4.9.
- 6.4.30 To protect the RPA and the amphibian barrier from disturbance, either the permanent stockproof fence or a temporary fence will be erected along this boundary at the start of the filling works.
- 6.4.31 As part of the proposals most of the trees within the site would be removed. As all the trees on the site are considered to be of low value, there are no arboricultural constraints or impacts associated with the works.

7 DUST ASSESSMENT

7.1 Introduction and method

7.1.1 This assessment has been undertaken to assess the impact of restoration operations on the existing dust conditions around the site. The assessment identifies possible dust-generating operations during the site restoration sequence, the measures taken to control dust generation, and the nearest receptors that might possibly be affected by any dust.

7.2 Site operations and dust control

7.2.1 The proposed restoration project is described in detail in section 2 of this statement. The imported inert fill would be construction waste such as brick or soil. These materials would not contain significant dust in their basic form, but dust could be mobilised if dry material is disturbed.

7.2.2 The site preparation works, the transfer of soils, overburden and imported inert fill to temporary storage mounds, and transfer of soils and overburden for the use in site restoration could release dust, particularly during periods of prolonged dry weather. In order to minimise the potential dust generated by the work, good site procedures to minimise dust generation would be employed. This would include:

- Phasing of the stripping and restoration works so as to minimise the extent of friable soil exposed at any one time;
- Carrying out progressive restoration in sequence, so that soils are not left unvegetated;
- Site vehicle speeds on loose-surfaced roads and surfaces should not exceed 5 mph;
- Surfacing haul roads with rolled highway planings, to minimise dust and mud generation by vehicles;
- Water spray dampening of soils to prevent dust blowing during dry weather conditions, where necessary;
- The adoption of construction equipment designated to minimise dust generation, with vertical (upward) exhaust pipes;

- Sheeting of lorries during transportation of fill materials;
- Use of a wheel wash to prevent mud being spread onto the road, and subsequently mobilised as dust;
- Minimising drop heights when tipping or unloading materials;
- Observation of wind speed and direction, and the suspending of those operations which unavoidably generate significant dust if there is risk of it blowing to the residential property, nursery or Gwastad Hall Home.

7.2.3 The presence of Wat's Dyke and its dense tree cover offers a good windbreak from the prevailing westerly wind, reducing the likelihood of wind-generated dust.

7.3 Receptors

7.3.1 The nearest receptors are listed in Table 14 and shown in the Location Plan. New housing is being built on land adjacent to the Hollybush Inn, to the north-west of the site.

Table 14 Potential receptors for dust

Location reference	Name	Distance to nearest point of site boundary
1	Gwastad Hall Residential Home	40m
2	Day Nursery	1m
3	Lane End (residential property)	10m
4	Gwastad Farm	300m
5	Houses on Llay Road	100m
6	Hollybush Inn and new housing	200m

7.3.2 Airborne dust could also be deposited on adjacent fields, used primarily for livestock grazing.

7.4 Assessment of impact, mitigation and post mitigation impacts

- 7.4.1 The proposed measures to avoid or suppress dust generation can prevent any significant impact arising from this source.

8 NOISE AND VIBRATION

8.1 Introduction

- 8.1.1 The objective of this assessment was to determine the likely impact of noise generated during the land restoration at Park Road, Cefn Y Bedd, Wrexham.
- 8.1.2 The approach to the noise assessment was to determine the likely noise levels from the operations and to comment on these within the context of Welsh Assembly Government guidance. The principal guidance documents ‘Technical Advice Note (Wales) 21 Waste’ and ‘Technical Advice Note (Wales) 11 Noise’ both refer to government guidance document MPG11 ‘Minerals Planning Guidance: the control of noise at surface mineral workings’ as the source of advice on noise generation and control. As the proposed operations have much in common with mineral working, this document is appropriate to the proposal. Noise from construction and open sites is commonly measured or modelled using British Standard BS 5228-1:2009 ‘Code of practice for noise and vibration control on construction and open sites’.

Human response to Noise

- 8.1.3 The human response to noise is subjective and affected by many factors, both acoustic and non-acoustic in nature. The likelihood of complaints in response to noise from mineral extraction is dependent upon factors including:
- The margin that noise produced by the movement or grading of materials exceeds the background noise level;
 - The absolute noise level experienced;
 - Time of day when the noise is heard;
 - The change to the existing noise environment.

- 8.1.4 Most noise from surface mineral sites is generated by excavating plant, earth-moving plant, blasting activities, processing plant and other heavy traffic. Much of this plant is large and powerful but not necessarily noisy. Vibration is generally only associated with blasting activities, and as blasting is not relevant to the restoration works at this site vibration will not be considered further in this report.

Minerals Policy Statement 2: Controlling and Mitigating the Environmental Effects of Minerals Extraction in England, Annex 2: Noise. (MPS2)

Minerals Technical Advice Note (Wales) 1: Aggregates

- 8.1.5 MPS 2 and MTAN 1 provide guidance on the planning considerations which Government expects to be applied to noise from surface mineral operations. It suggests that planning conditions are applied to ensure that noise emissions from extractive processes are reduced at source and thereby controlled to reasonable levels.
- 8.1.6 The guidance recommends that a maximum noise level of 55dB $L_{Aeq,1 \text{ hour}}$, is applied and that Mineral Planning Authorities and the site operator should seek to establish a noise limit at sensitive receptors which does not exceed the monitored background noise level ($L_{A90,F}$) by more than 10dB (A). In order to prevent sleep disturbance an absolute limit of 42 dB L_{Aeq} (free field) should be applied for any works to be undertaken during the night at all sensitive receptors.
- 8.1.7 All mineral operations generate noise from short term activities that cannot meet the limits set for normal operations. This often include works that take place at commencement or completion of the extraction process such as soil stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new or permanent landforms and aspects of site road construction and development. In this case increased temporary daytime noise limits of up to 70 dB $L_{Aeq, 1 \text{ hour}}$ (free field) may be permitted. Higher limits than these would normally only be permitted for defined periods of up to 8 weeks required to facilitate essential site work. Often work of this kind is expected to give long-term environmental benefits.

- 8.1.8 The guidance provided in MPS 2 / MTAN 1 and BS 5228 aims to help local planning authorities in their consideration of applications for mineral extraction licences adjacent to noise sensitive receptors such as residential dwellings and any site carrying national and international environmental designations.

8.2 Background noise

- 8.2.1 The site is a former sand and gravel working, partially infilled to a level similar to that of surrounding land and partially at a level considerably below that of surrounding land. There is very little consistent noise during still weather conditions, and so the ‘background’ noise is made up of distinguishable, individual noise sources such as vehicles on the B5102 Llay Road, industrial estate operations, agricultural operations, aircraft and the unauthorised motorcycles which use the former sand and gravel working.
- 8.2.2 Three locations were selected to represent the range of locations exposed to the potential noise from the restoration operations, as shown in Appendix 8 – Figure 8A01). These locations (Table 15) are exposed to road traffic noise (from either B5102 or Park Road) which would affect the northern or eastern facades of the buildings. The proposed works would expose the southern or western facades to any noise arising from site operations.

Table 15 Noise receptor locations

Location reference	Name	Distance to nearest point of site boundary
1	Lane End (residential property)	10m
2	Day Nursery	1m
3	Coach House, Gwastad Hall	40m

- 8.2.3 The background noise at these properties has been assumed to exceed 45dB(A) and so in accordance with the Minerals Technical Advice Note (Wales) 1: Aggregates the target limit for noise experienced at the properties during the proposed works would be not to exceed 55dB(A).

8.2.4 The potential impact during the land restoration would be minimised by:

- Avoiding night time works (proposed working hours stated in section 2),
- Using the developing landform and soil stockpiles as a barrier to noise, where possible,
- Operating static plant behind baffle mounds or stockpiles, where possible
- Careful control of noise during construction works, e.g. from vehicles, reversing alarms and mechanical tools,
- Switching off, or reducing to idle, the engines of plant which is not in continuous use,
- Maintaining vehicles to minimise avoidable noise, e.g. from rattles, squeaks and ‘body slap’,
- Maintaining haul routes used by vehicles to minimise rattles, squeaks and ‘body slap’.

8.2.5 Following initial noise modelling which indicated that target noise levels could be exceeded at some receptors if all operations were conducted simultaneously, patterns of working or ‘site rules’ were developed to avoid these ‘worst case’ circumstances coinciding. Noise-reducing fencing was introduced along the northern boundary of the site to protect the Day Nursery and Lane End. In the absence of a specification for the fencing, the noise reduction assumed has been limited to -5 dB(A). The noise calculation results presented in 8.3 reflect and describe these circumstances.

8.3 Prediction of noise level from the proposed operations

8.3.1 Details of the kinds of activities that would be carried out on site during the restoration operations have been provided by the applicant (see section 2). This information has been used to calculate noise levels at each noise sensitive receptor following the procedures outlined in BS 5228. A simple phasing of the works has been developed and the working day has been assumed to be from 7.00am to 6.00pm although during the winter the period of working would be shortened by the available hours of daylight.

8.3.2 The land filling/regrading process covers a relatively small area of 2.9 hectares. However, within the site boundary plant would be moving variably closer and further

away from the different receptors. Some activities, such as the transport of materials to and from the entrance on Park Road, will be the worst case for the nearest receptors. Activities such as the final grading, preparation and seeding of restored areas will take place close to receptors, though for short periods. These activities would be similar to the agricultural operations which take place adjacent to many residential properties in the area.

8.3.3 The following activities, or combinations of activities, have been modelled to represent the range of working ‘scenarios’ which would occur at the site. They are shown diagrammatically in Appendix 8 - Figure 8A01.

1. Fill material brought by lorry from entrance to tipping point A, and tipped. Fill graded and tracked into place by excavator working at Location 1. No noise screen fencing.
2. Fill material brought by lorry from entrance to tipping point A, and tipped. Fill graded and tracked into place by excavator and dozer working together at Location 1. Noise screen fencing erected.
PLUS crusher and screen, loaded by excavator, operating behind material stockpiles at Location 4.
3. Fill material brought by lorry from entrance to tipping point A, and tipped. Fill graded and tracked into place by excavator working at Location 2. Noise screen fencing erected.
4. Fill material brought by lorry from entrance to tipping point B, and tipped. Fill graded and tracked into place by excavator working at Location 3. No noise screen fencing.
5. Crusher and screen, loaded by excavator, operating behind material stockpiles at Location 4. Crushed re-usable material loaded to lorry by excavator. Noise screen fencing erected.

Details of plant to be used

8.3.3 Details of the types of plant which would be used during the importation, placing and grading of materials, are provided in Table 16 with their typical sound pressure levels when in use at a reference distance of 10 metres. These figures have been

taken from tables contained within BS 5228:2009 Annex C. The source sound pressure level and the percentage of the working day that such plant normally operates, enables noise levels to be calculated at an identified receptor. Construction plant would not normally operate continually throughout the working day. A percentage ‘on-time’ of 100% has been assumed for the plant as a ‘worst case’ scenario. Haulage vehicles would arrive at the site, traverse to the tipping location, and then leave the site within an operating period of less than 10 minutes. The noise contribution from this source has been modelled assuming a) the peak rate of importation stated in section 2 and b) the average rate.

- 8.3.4 For each of the working ‘scenarios’ described in 8.3.2 the predicted daytime noise levels have been calculated for the selected noise sensitive locations, based on the data in Table 16. Noise for peak and average rates of infilling has been calculated separately. Soft ground attenuation has been assumed in deriving the noise levels only where appropriate, since for most scenarios the receptor is elevated from the working location and so transmission is largely in ‘free air’. Where screening by landforms or fencing is included, soft ground attenuation has been ignored in accordance with BS5228. The existing landform offers no screening between the modelled working locations and the Day Nursery or Lane End, and so only the screening of stockpiles around the crusher and screen, or noise fencing where erected, has been taken into account. The landform of the western boundary, together with the former quarry face and day nursery building, do provide screening for the Coach House and Gwastad Hall. The predicted maximum noise levels are for short duration ‘worst case’ impacts during filling works but in practice; noise levels would be lower for most of the time and absent during non-operational periods.

Table 16 Predicted noise levels from site operations: plant

Plant	Reference plant in BS 5228 Annex C	Activity Equivalent Continuous sound pressure level L_{Aeq} at 10m, dB	For use in:
Dozer Cat D4 , dozing	Table C8 item 6 138kW	78	Filling
Tracked Excavator JS220	Table C8 item 10 96kW	69	Filling
Screen	Table C10 item 14	81	
Crusher	Table C1 item 14	82	
Road Lorries, site haulage	Table C8 item 20	79	Haulage
Excavator, loading	Table C10 item 2 19t	76	Loading

Table 17 Calculated noise at receptor locations

SCENARIO peak / average filling rate		Lane End Noise dB(A)	Day Nursery Noise dB(A)	Coach House Noise dB(A)
1. Filling location 1, no noise screen	peak	51.3	55.6	47.9
	average	48.1	52.4	41.9
2. Filling location 1 with dozer, noise screen PLUS crushing and screening	peak	55.6	56.4	
	average	54.6	55.4	
3. Filling location 2, noise screen	peak	52.7	55.5	
	average	47.7	54.5	
4. Filling location 3, no noise screen	peak	59.1	58.0	45.4
	average	55.5	55.4	41.9
5. Crushing and screening location 4, lorries removing (continuous), noise screen erected	peak	58.4	54.5	
	No lorries	54.4	51.9	

8.4 Discussion of results of the noise assessment

- 8.4.1 The modelling results shown in Table 17 demonstrate that some combinations of operations can be conducted without exceeding the limit of 55dB(A) suggested in guidance, and that other combinations would exceed that limit if no noise screen fencing is erected or all operations were conducted simultaneously. The operator would therefore plan his works so that operations which generate the most noise were not carried out until noise fencing or screening mounds are erected, and would limit the intensity of site working (rate of material import or number of simultaneous operations) to keep noise experienced at receptors within agreed limits.
- 8.4.2 It is proposed that noise limits greater than 55dB(A) should be agreed through conditions for specified, limited durations in order that the operator should have some flexibility to respond to peak periods and to carry out particular operations at the start and end of the restoration works. For example the initial works near the receptor properties, and the surface treatment as part of vegetation establishment, may involve periods of greater noise generation. None of the modelled scenarios reached 60dB(A) at either receptor.
- 8.4.3 The effect of additional distance and the landform in reducing noise at the Coach House can be seen in the Table. Modelling was not therefore extended to Gwastad Hall but this property is well screened by the landform and is at lower elevation so noise levels would be lower still.
- 8.4.4 Moorbridge Construction recently filled the disused railway cutting between the A541 and River Alyn with inert waste, using similar working methods. No adverse comment was generated by this operation.

8.5 Conclusions

- 8.5.1 Noise from the proposed operations can be managed effectively so that noise exposure limits suggested in guidance can be met.

9 GEOLOGY AND SOILS

9.1 Introduction and background to site

9.1.1 The site comprises a rectangular depression left by sand and gravel mineral extraction, with a central raised area due to partial infilling (Appendix 9A - Figure 3). Elevations within the site range from 74 to 78 metres Above Ordnance Datum (mAOD).

9.1.2 The site lies on the eastern margin of the deeply incised valley of the River Alyn. At the western boundary of the site the land rises steeply from the base of the old quarry void and then descends again some 15 m towards the river, from 78-82 mAOD to <63 mAOD. To the east the land is relatively flat, rising gently to the northwest.

9.2 Sites of Geological and Ecological Interest

9.2.1 Details of designated sites of geological and ecological interest, both statutory and non-statutory, within a 2 km radius of the centre of the site were obtained from www.magic.gov.uk (Appendix 9A - Figure 1) and the COFNOD database.

9.2.2 There are no statutory designated sites in the near vicinity with the exception of Llay Bog SSSI, 580 m to the southeast. There are no Regionally Important Geological Sites (RIGS) within 1km of the site.

9.2.3 Water-dependent ecology is likely to be present in the adjacent River Alyn, small seasonal ponds on the site and a larger permanent lake to the southeast; although these sites have not been statutorily designated.

9.3 Landfills

9.3.1 The Environment Agency has indicated the presence of 2 authorised landfill sites and 4 historic landfill sites, within a 2 km radius of the site (Appendix 9A Figure 1), as detailed in Table 18.

Table 18 Location of landfill sites

Name	Landfill type	Licence No	Operator	Distance from site
Authorised landfill sites				
Astbury Landfill (Rossett)	Hazardous household/ commercial and industrial waste	37116	WRG Environmental	2 km NE
Bryn-y-Gaer Quarry	Inert – taking non-biodegradable wastes	37050	Ash Waste Services Ltd	1.8 km N
Historic landfill sites				
Astbury Landfill	-	-		2 km NE
Gwersyllt Park	-	-		1 km S
Gwersyllt Park Quarry	Inert	-	-	1 km S
New Road	Industrial, commercial, household	-	-	2 km SE

9.3.2 Given the significant distances involved it is considered unlikely that these landfills will directly influence the site.

9.3.3 The Local Authority has confirmed that there are no determinations of ‘contaminated land’ sites (under the ‘Contaminated Land Part 2A’ procedure) within the Wrexham County Borough, and no contaminated land in the vicinity of the site has been identified.

9.4 Regional Geology

9.4.1 Information on the solid and superficial (‘drift’) geology has been obtained from BGS Maps 108 and 121 Solid and Drift, scale 1:50,000; this information is illustrated on Appendix 9A - Figures 5 and 6.

9.4.2 The site lies on the boundary between BGS Map Sheet 108 (Flint) to the north and Sheet 121 (Wrexham) to the south. The modern nomenclature for the geological formations based on Sheet 108 has been used in the descriptions.

9.5 Solid

9.5.1 The regional solid geology comprises Silurian shales and siltstones which outcrop in the hills to the west. They have a general easterly dip. In turn Carboniferous Limestone, Millstone Grit and Coal Measures outcrop progressively further east. Table 19 shows the solid geology sequence within the region.

Table 19 Solid geology sequence

	Formation	Thickness (m)	Description
Triassic	Kinnerton Sandstone	400	Sandstone
Carboniferous Westphalian	Coed-yr-Allt	150	Mudstone
	Ruabon Marl	240-330	Mudstone
	Bettisfield Formation	400-520	Productive Coal Measures, mudstone, sandstone, coal seams
Unconformity			
Carboniferous Namurian	Gwespyr Sandstone	25	Sandstone
	Holywell Shales	25 -45	Mudstone
	Cefn-y-Felw Sandstone	150-250	Sandstone

9.5.2 The regional geological structure is moderately complex with significant faulting and some folding. The strata generally have a gentle dip to the east, such that successively older strata outcrop to the west. Several north-northwest- and southwest- striking faults are recorded nearby.

9.6 Superficial deposits

9.6.1 Superficial deposits in the region comprise large areas of glacial till with substantial sheet deposits of glacial sand and gravel on the lower ground and around the river valleys. Erosion has removed many of these superficial deposits, exposing bedrock on the higher ground in the west of the region.

9.7 Local Geology

- 9.7.1 The site is located on glacial sand and gravel which formed the economic mineral originally extracted at the site to form the quarry void (Appendix 9A - Figure 6). The deposit follows the eastern flank of the River Alyn extending <500 m eastwards from the incised river valley. To the east the area is overlain by glacial till and to the west the bedrock is exposed within the river valley.
- 9.7.2 The solid geology beneath the site comprises the upper section of the Middle Coal Measures, known as the Bettisfield Formation, 400-520 m of productive Coal Measures consisting of shales with interbedded sandstones and coal seams. The Bersham Yard Group coal seam is potentially the closest to the surface beneath the site, potentially some 20-40 m from the top of the Bettisfield Formation. Overlying this is the Ruabon Marl Formation shown outcropping some 100 m east of the site. A north-northwest to south-southeast fault runs some 150 m to the east of the site, marking the contact with the downthrown Coed-yr-Allt Formation.
- 9.7.3 The superficial geology beneath the site comprises glacial sand and gravel, a significant portion of which was removed during mineral extraction. The contact between the sand and gravel and the underlying solid geology is shown on the BGS map to approximately coincide with the 75 mAOD contour along the valley side, although the accuracy of this is unknown.
- 9.7.4 On 16th June 2010 a total of 8 trial pits were excavated at the site (Appendix 9A - Figure 3) to investigate the historic waste and in-situ material. Full details of the trial pit logs are included in Appendix 9B.
- 9.7.5 Trial pits TP1, 2, 4, 5, 6 and 8 all encountered sand and gravel, ranging from coarse, well-sorted, orange sand to orange-brown gravel, with sub-rounded cobbles (<50 cm, <20%) of quartzite and siltstone. In several locations (TP1 and TP8) grey, silty clay (with <20% cobbles) was encountered beneath the sand and gravel; however, it was not encountered in TP2 which was within sand to the base of the pit at c70 mAOD (versus 72.7 mAOD in BH1) suggesting heterogeneity in the occurrence of the sand and clay.

9.8 Colliery spoil

9.8.1 Colliery spoil was encountered in all trial pits with the exception of TP8 which is located close to the edge of the quarry. Spoil material was relatively uniform across the site comprising c60% fine-grained, dark grey/black material (clay and coal dust) plus angular fragments (<10 cm) of coal, shale and sandstone. Between 0-30% of the shale appeared oxidised to a red/brown colour indicating earlier combustion within the original spoil heap. Sulphides were not observed within the material. The thickness of the spoil ranged from up to 80 cm in the low-lying areas of the quarry (TP1 and TP2) to over 4.4 m in TP7. Based on elevations taken from the site topographic map a summary of the trial pits is presented in Table 20 and schematic cross-section is presented in Appendix 9A - Figure 7.

Table 20 Summary of the trial pits

Trial pit	1	2	3	4	5	6	7	8
Estimated ground level (mAOD)	74	74	77.5	77.6	78	78	78	74.5
Estimated base of waste (mAOD)	73.2	73.2	<73.4	73.5	77.1	77.7	<73.5	-
Water level 16/06/10 (mAOD)	72.7	70.8	<73.4	<73.4	<76	<77.1	<73.5	<70.9

9.8.2 Details from the BGS archive record groundwater intercepted in the vicinity of the site at Llay Bank Opencast Mine immediately to the north of the site; Cefn-y-Bedd Mine 250 m to the southwest; and Llay Hall Colliery with a shaft recorded to a depth of 367m located 500 m south of the site. Two adit entrances have been recorded by the BGS, located 180 m south-southwest of the site boundary within the river valley, probably related to the working of coal seams beneath the site. The closest water well to the site on the BGS archive is at Bryn-Yr-Eithin Farm, some 700 m to the southeast.

10 WATER QUALITY AND DRAINAGE

10.1 Introduction and background

10.1.1 It is proposed to import inert fill material to return the site to beneficial agricultural land use with areas of ecological improvement. The intention is to apply under the Environmental Permitting Regulations such that the operation is classed as a recovery activity. The waste materials will replace non-waste materials which would have had to be used for the purpose, so conserving natural resources. The volume of waste imported will be the minimum required to achieve the final surface for the resultant beneficial use.

10.2 Scope of assessment

10.2.1 The objectives of the assessment are summarised below:

- Define current baseline conditions in the vicinity of the site, relating to all aspects of the water environment.
- Identify and evaluate current and potential impacts of the proposed development upon the water environment.
- Propose appropriate mitigation measures, if required.
- Identify residual effects that may remain after the completion of the proposed restoration.

10.2.2 As part of the investigation 8 trial pits were excavated and 4 piezometers installed to allow for on-going monitoring at the site.

10.3 Data sources

10.3.1 The following data sources were used in the investigation:

The Environment Agency

- Rainfall data
- Licensed abstractions
- River Alyn flow data
- Statutorily protected sites of ecological interest
- Surface water quality (GQA) data

British Geological Survey (BGS)

- Geological map –1:50,000 Sheet 121 Wrexham and Sheet 108 Flint, Solid and Drift
- Well records

Ordnance Survey (OS)

- 1:25,000 scale, Explorer 256, Wrexham

Wrexham County Borough Council

- Environmental Health Services, unlicensed private water supplies, Contaminated Land Register

Countryside Council for Wales

- Sites of Special Scientific Interest

10.4 Hydrology*Watercourses*

- 10.4.1 The hydrology and water features surrounding the site are indicated in Appendix 9A - Figure 1. The site is located within the catchment of the River Alyn, which is situated some 60 m to its west and flows southwards. A major tributary, the River Cegidog, enters the River Alyn from the west immediately downstream of the site. The River Alyn ultimately discharges to the River Dee some 12.5 km downstream.
- 10.4.2 River Alyn flow data acquired from the Environment Agency for Pont-y-Capel Gauging Station (NGR SJ 336 541), at a point some 4.3 km down-river of the site, record a mean flow of 2.41 m³/s between 1965 and 2008 (Q95 = 0.475 m³/s, Q10 = 5.635 m³/s). Applying a ratio based on catchment area the mean flow adjacent to the site was calculated by the Environment Agency as 2.28 m³/s (Q95 = 0.45 m³/s). The ‘natural’ Q95 estimated from spot gaugings upstream of Mold STW was Q95 = 0.25 m³/s. Average rainfall for the 227 km² catchment area is 916 mm. Land use comprises 60% pasture, 15% woodland with some urban development in low-lying areas to the west. Major ‘natural’ loss of water occurs from the upper 70 km² of the catchment in limestone and mine drainage tunnels.

- 10.4.3 At the time of the site visit (16th June; 2010) flow in the River Alyn adjacent to the site was estimated as <0.5 m³/s. Channel width was estimated as 8 m, banks some 1 m in height, with a water depth of 0.5 m and a silt and gravel base. There are no other watercourses in the immediate vicinity of the site. The springs closest to the site, marked on the OS map, are located c800 m to the west, on the opposite bank of the River Alyn.

Waterbodies

- 10.4.4 The largest waterbody in the vicinity is located some 50 m to the southeast of the site. This is artificial, created by mineral extraction within the sand and gravel, and is considered to be groundwater-supported.
- 10.4.5 There are 2 seasonal waterbodies within the site boundary. The northern waterbody is shallow (<30 cm) and primarily fed by ponding of rainfall run-off within a shallow depression on low permeability material, it is therefore likely to dry out in the summer. The pond on the southern site boundary lies in contact with sand and gravel and is considered likely to be fed by both rainfall run-off and groundwater. It is considered less likely to dry out but will vary in size seasonally. At the time of the site visit water levels were estimated to be some c73 mAOD with a depth of <0.5 m.
- 10.4.6 Two small ponds are located 360 m northeast of the site. Two ponds are located at Llay Hall Farm 950 m east of the site. Areas of marshy ground are marked on the OS map 200 m south and southeast of the site (potentially associated with restored mineral workings). There is a small pond on the west bank of the River Alyn 550 m to the northwest of the site.

Drainage

- 10.4.7 A 22 cm (ID) metal pipe (Appendix 9C - Photosheet 6) was identified within the side of the river valley some 50 m south of the southeastern corner of the site, some 7-10 m below the valley crest. Discharge from the pipe was estimated to be some 5 l/s. A block structure with a locked metal cover was located some 10 m down-gradient of the pipe and also appears to be discharging some 5 l/s through an outlet in the side (Appendix 9C - Photosheet 7). The original purpose of the structure is unknown; it could potentially be an old disused spring collector system or a cap to an old

mineshaft of which there are several recorded further to the south. Anecdotal evidence suggests the origin of the water discharging from the pipe, at an estimated level of 70-75 mAOD, could be related to the old mineral workings and lake immediately to the southeast of the site, although an outfall pipe from the lake was not observed during the site visit.

10.4.8 Seepage was observed from the valley sides at a similar elevation to the pipe, and may represent groundwater discharge at the contact of the sand and gravel with the underlying bedrock. A spring/seepage from a depression of some 2 l/s was observed at a similar elevation further to the north on the valley side.

10.4.9 There is no evidence of a field drainage system or discharge to surface water from the site. Run-off is contained within the old quarry void before discharging to ground.

Surface water quality

10.4.10 The Environment Agency measures chemical water quality at various locations on the River Alyn. The closest is a 5.4 km monitored reach located adjacent to the site. Chemical water quality (dissolved oxygen, BOD and ammonia) and biological quality was rated B ‘good’ in the most recent assessment from 2008. It is noted that monitoring has recorded “5 - very high” levels of phosphates. Nitrate levels are ranked as “4 - high”. This may reflect the influence of agriculture and sewage treatment works discharge.

Flooding

10.4.11 The site does not lie within a floodplain as defined by the Environment Agency (Appendix 9A - Figure 4). The closest area of flooding is confined to the deeply incised River Alyn some 60 m west of the site, which lies at an elevation some 15 m below the site ground level.

Rainfall

10.4.12 Rainfall data from a nearby gauging station (Five Fords) has been obtained from the Environment Agency. A summary of the average monthly rainfall recorded between January 1996 and December 2009 is shown in Table 21. The station is located

approximately 9 km southeast of the site and recorded a mean annual rainfall of 764.1 mm over the monitoring period.

Table 21 LTA monthly rainfall data (mm)

Station name: Five Fords					Station Number: 546190							
Station location: NGR SJ 36143 48044					Period data collected: 01/1996 - 12/2009							
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Av rainfall	64.3	47.3	50.6	55.7	67.7	69.2	63.7	73.3	57.2	77.2	80.9	57.1

Surface water abstractions

10.4.13 Information provided by the Environment Agency indicates that there are no current licensed surface water abstractions within a 2 km radius of the site.

10.5 Hydrogeology

Setting

10.5.1 Four potential aquifers occur in the region: the Permo-Triassic Sandstones; the Carboniferous Namurian Sandstones; sandstone horizons within the Coal Measures; and the superficial deposits of sand and gravel. Both the Permo-Triassic and Namurian Aquifers are at such a distance from the site (>4 km, Appendix 9A - Figure 3) that they are not considered further in this assessment. There are commonly thin sandstone units within the Coal Measures which can provide local water supplies. The Cefn Rock is a significant sandstone unit identified within the Coal Measures - Bettisfield Formation which outcrops to the west and is likely to occur at depth beneath the site. However, the bulk of the Bettisfield Formation comprises shale which has a low permeability. There is the potential for historically-worked coal seams in the vicinity of the site which could potentially transmit significant volumes of groundwater if intersected. The adit entrances identified by the BGS 180 m to the south-southwest are considered likely to provide drainage for the coal seams and surrounding strata.

10.5.2 The main aquifer with potential to interact with the site is considered to be the superficial sand and gravel. This is classed as a secondary aquifer (ie Type A) by the Environment Agency, defined as permeable layers capable of supporting water

supplies at a local rather than strategic scale, and in some cases forming an important source of baseflow to rivers. These are generally aquifers formerly classified as minor aquifers.

Local

- 10.5.3 The site has been excavated into the sand and gravel and then partially backfilled with colliery spoil. The superficial gravels follow the east bank of the river becoming narrow to the north but increasing in width to the southeast. Further to the east the superficial deposits comprise glacial till which is considered to be of generally low permeability. To the west of the site the deeply incised channel of the River Alyn forms the effective western limit of the sand and gravel aquifer (Appendix 9A - Figure 6). The shales of the Bettisfield Formation are a non-aquifer and will act as a natural barrier to downward groundwater flow, forming the base of the sand and gravel aquifer.
- 10.5.4 The historic inert infill at the site is considered likely to have a lower permeability than the surrounding sand and gravel and may potentially influence groundwater flow if it has been deposited beneath the watertable. The base of the fill material is estimated to be at some 73.2 mAOD and the top of the bedrock at between 70-75 mAOD.

10.6 Aquifer properties

In-situ material

- 10.6.1 Within the underlying Coal Measures, intergranular permeabilities are considered to be generally low and the predominant groundwater flow mechanism is likely to be through fractures and joints or workings within the coal seams.
- 10.6.2 The flow mechanism within the sand and gravel of the superficial deposits is likely to be intergranular, although the presence of silt and clay can reduce this and lead to variations between vertical and horizontal conductivity. Typical values of hydraulic conductivity in glacial sands and gravels fall in the range 1 to 50 m/d.

Historic fill material

- 10.6.3 The trial pit site investigation indicated the historic fill material comprises colliery spoil. The hydraulic properties of this material are likely to differ significantly from the in-situ strata surrounding the site. The fine, compacted material within the spoil may result in a lower permeability than the surrounding sand and gravel. However, it is likely that the majority of the historic fill material was deposited above the watertable.

Groundwater levels and flow direction

- 10.6.4 The sand and gravel forms an unconfined aquifer beneath the site. Water levels recorded in the trial pits within the quarry floor on 16th June 2010 ranged from 70.8 to 72.7 mAOD. The higher value was potentially related to a perched watertable within the sand and gravel due to the underlying clay. This clay horizon was not intercepted within TP2 (Appendix 9A - Figure 3), hence the deeper watertable.
- 10.6.5 The pond situated along the southern site boundary (Appendix 9A - Figures 2 and 3) extends to a maximum of c0.5 m into the underlying sand and gravel, and is potentially in hydraulic continuity with the groundwater encountered in TP1 at a level of c73 mAOD.
- 10.6.6 The water level in the River Alyn is estimated to be some 65 mAOD, based on the 1:25,000 OS map. Water levels in the pond to the southeast of the site are estimated to be between 74.5 and 75.5 mAOD although a topographic survey would be required to confirm this and other water levels. Water levels are estimated to be between 1.3 mbgl and 3.2 mbgl in the western section of the quarry floor and c0.3 mbgl in the low-lying area associated with the pond in the south of the site. The site investigation indicated that the watertable is likely to lie below the base of the colliery spoil.

Interpretation

- 10.6.7 Groundwater flow beneath the site is considered likely to be westwards, ultimately discharging as seepage in the valley side up-gradient of the River Alyn.

- 10.6.8 The site is located adjacent to the deeply-incised valley (c15 m) of the River Alyn as indicated in the schematic section (Appendix 9A - Figure 7). Under natural conditions groundwater flow in the sand and gravel is considered likely to be westwards, towards the valley. It is assumed that flow takes place through the sand and gravel via ‘perched’ flow along the contact with less permeable clay horizons and along the contact with the underlying bedrock shales. The contact between the superficial deposits and the underlying bedrock is exposed in the valley side and it is likely that groundwater seepage discharge will occur at this contact.
- 10.6.9 The extraction of aquifer material (sand and gravel) and its replacement by fill material may have altered this pattern if historic fill was deposited below the watertable. However, the site investigation indicates the fill to be above the watertable with sand and gravel remaining in-situ beneath. In addition the extraction area was relatively small compared to the surrounding aquifer and the overall flow direction is still likely to be to the west.
- 10.6.10 Any recharge of the Coal Measures from the overlying sand and gravel may potentially be channelled within the old underlying mine workings and discharge via the two adits in the vicinity or discharge via seepage to the valley side and base.

Groundwater abstractions

- 10.6.11 The site is not located within any designated groundwater Source Protection Zones (SPZs) for public water supply as defined by the Environment Agency. The boundary of the closest Total Catchment Area lies some 3 km to the east of the site. The EA has indicated that there are no current licensed groundwater abstractions within 2 km of the site.
- 10.6.12 The Environmental Department of Wrexham County Council has no records of any private water supplies within the vicinity of the site.

Groundwater quality

- 10.6.13 The closest Environment Agency groundwater monitoring borehole is some 4 km to the west of the Application Area and is not relevant to the site. Boreholes at Astbury Quarry Landfill lie 1.5 km northeast of the site and are also not considered relevant.

- 10.6.14 Water quality within the sand and gravel is anticipated to be rainfall-derived, and subject to mineral dissolution and agricultural pollution. As the groundwater level is considered likely to be below the base of the colliery spoil, which is inert material, there is unlikely to be a significant impact on groundwater quality from this source.
- 10.6.15 Water quality within the underlying bedrock Coal Measures could potentially contain elevated concentrations of metals (particularly iron), sulphate and chloride.
- 13.6.16 Known landfill sites and associated water quality issues are not recorded within the immediate vicinity of the site. Evidence of previous mineral extraction, immediately to the south of the site, is recorded on maps from the 1960s. It is therefore possible that waste material such as colliery spoil may have been deposited to restore the area south of the site.
- 10.6.17 Several pollution incidents related to fly-tipping are recorded on the Environment Agency register in the vicinity of Cefn-y-Bedd and Bryn-yr-Eithin to the south. However, the status of all incidents is recorded as closed.

10.7 Existing Condition

Site layout

- 10.7.1 The site comprises a partially infilled rectangular depression formed from a partly restored former quarry site. The site is covered with a mixture of uncultivated grassland and scrub which has been lying idle for many years.

Water management

- 10.7.2 The base of the void is situated above the watertable and continuous dewatering is not required. Active water management does not take place.
- 10.7.3 The surrounding and underlying sand and gravel provides good drainage however, areas underlain by the compacted colliery spoil have lower permeability. Rainfall was observed to collect to form seasonal ponds of standing water in such areas. Rainfall run-off is likely to occur from the central raised section of the site and collect in the surrounding low-lying areas. There is no observable surface water

discharge point from the site or external surface water inlet. Water influent to the site is likely to be lost via evapotranspiration or discharge to ground.

- 10.7.4 Water within the pond in the southern section of the site is likely to be in continuity with groundwater within the sand and gravel. It is understood that a field drainage system is not installed beneath the site. Unconfirmed anecdotal evidence suggests that the pipe discharge observed in the Alyn Valley is related to a pipeline buried to the south of the site connecting to the old mineral working and lake to the southeast of the site.

10.8 Control of Site Restoration operations

- 10.8.1 The site covers an area of approximately 2.79 hectares. It is proposed to restore the site to suitable ground levels for beneficial agriculture and wildlife use by the importation of inert waste as described in chapter 2. According to Environment Agency Guidance EPR13 a recovery operation, as opposed to waste disposal, is when waste is used as a suitable replacement for non-waste materials that would otherwise have been used to achieve the same end benefit. It is proposed that the infilling will be classed as a recovery operation and meet the requirements of the new (1/4/2010) standard permit from the Environment Agency.
- 10.8.2 The appropriate requirements are set out according to “Standard Rules SR2010No10_100Kte - use of waste for reclamation, restoration or improvement of land”. The standard rules allow the operator to carry out treatment of land that has been previously subject to industrial or other man-made development for the purpose of reclamation, restoration or improvement by the spreading of waste. Given the inert nature of the permitted wastes a geological barrier will not be required. The main conditions for the standard licence are as follows:
- Permitted waste types - Non Hazardous - as listed in rules other than waste consisting solely or mainly of dusts, powders or loose fibres or waste in liquid form
 - Quantity of waste limited to no more than 20,000 cubic metres of waste per hectare and total of 100,000 tonnes

- The only point source discharges to controlled waters or groundwater are of surface water from the roofs of buildings
- The activities shall not be carried out within 500 m of a European Site (candidate or Special Area of Conservation, proposed or Special Protection Area or Ramsar site) or a Site of Special Scientific Interest (SSSI)
- The activities must also be outside groundwater source protection zones 1 (inner) or 2 (outer), 10 m from a watercourse and be 50 m from any spring or well or any borehole not used to supply water for domestic or food production purposes or 250 m from any spring or well, or any borehole used to supply water for domestic or food production purposes.
- If these conditions cannot be met then a bespoke permit will be required. Based on our assessment these conditions will be met. However, the final quantity of imported waste will be subject to review.

10.9 Proposed water management during restoration

- 10.9.1 The base of the void, which lies at an elevation of some 74 mAOD, is above groundwater level and, therefore, there is no requirement for groundwater management before infilling.
- 10.9.2 Due to the inert nature of the waste, leachate management and monitoring infrastructure is not necessary.
- 10.9.3 During the operational phase of the proposed recovery operation, rainwater run-off will be collected within the base of the void and drained into a series of settlement lagoons to allow silt settlement and ensure adequate water quality control. The ecologically-sensitive pond in the southern section of the site will be protected from turbid run-off. The new elevated landform will ensure run-off is collected in low areas of the site and channelled to a series of water features. These will comprise both ponds lined with locally-sourced clay, and unlined ponds in connection with the groundwater within the sand and gravel aquifer.
- 10.9.4 It is proposed that the existing seasonal pond is retained for wildlife purposes, keeping a 3 m buffer around it. The pond is considered likely to be dependent on both groundwater and surface water, and its levels will fluctuate seasonally. Given the potential connection with the groundwater, the proposed restoration is expected to have a limited impact on water levels in the pond, providing that the buffer zone is

maintained and excavation in the immediate vicinity is avoided. Direct run-off to the pond with high suspended solids content should be avoided to prevent siltation and disconnection from the groundwater system.

10.10 Potential Impacts and Mitigation measures

Groundwater and Groundwater levels

- 10.10.1 The current base of the site is above the watertable and there is no requirement for groundwater management prior to recovery. Groundwater levels will therefore not be significantly affected by the recovery operation.

Groundwater flow pattern

- 10.10.2 As the additional fill material is above the watertable, significant changes in groundwater flow patterns are not predicted.

Groundwater quality

- 10.10.3 The proposed works may impact upon groundwater quality either by accidental spillage of chemicals or fuel from fixed or mobile plant, or by the deposition of contaminated materials within the imported fill material. Contaminants within the groundwater may then subsequently migrate to eventually discharge via seepage to the River Alyn or other receptor, subject to travel times and natural attenuation.
- 10.10.4 In the unlikely event of spillage, the fluid will be retained within the quarry void for a sufficient time to allow its collection by the use of oil absorbent materials. The contaminated material will then be disposed of in accordance with current best practice. All chemicals and fuel tanks will be contained within bunded areas, in accordance with current best practice.
- 10.10.5 All importation of materials would be carried out within the terms of an Environmental Permit which would specify the criteria for acceptability. Any waste from a potentially contaminated site would be analysed before importation. Permitted wastes are therefore unlikely to contaminate groundwater.

- 10.10.6 The watertable is below the base of the site, therefore groundwater interaction with the infilled material will be limited.
- 10.10.7 Any water percolating through the inert landfill is unlikely to contaminate groundwater as the fill will comprise solely inert waste material. Strict waste acceptance criteria will be imposed and therefore there should be no adverse impact on water quality from the operation.
- 10.10.8 The historical colliery waste has been in place for a significant period and negative impacts, such as ochre deposition, have not been reported. The proposed recovery operation will provide a cap on the colliery spoil, potentially reducing rainfall percolation through the material.
- 10.10.9 The potential of the site to generate leachate is low, therefore the risk of creating an adverse impact on either groundwater or surface water is considered to be commensurately low. There are likely to be no List I or List II substances within the waste and input will be strictly controlled to prevent polluting substances entering the waste stream. It is therefore considered that the Groundwater Regulations 1998 do not apply to this site and active leachate management is not proposed.

Groundwater abstractions

- 10.10.10 As the proposed workings are not likely to have any significant impact upon groundwater flow or quality, it is considered very unlikely that the works will have any impact upon groundwater abstractions in the vicinity. There are no currently-licensed or private water supplies which have been identified within 2 km of the site. The site is:

- outside groundwater source protection zones 1 (inner) or 2 (outer),
- over 10 m from a watercourse and over 50 m from any spring or well or any borehole not used to supply water for domestic or food production purposes,
- over 250 m from any spring or well, or any borehole used to supply water for domestic or food production purposes.

Surface water and Surface water quality

- 10.10.11 The closest surface water receptors to the site are the seasonal pond within the site boundary, the larger pond ('The Leak') to the east, and the River Alyn to the west. No surface water abstractions were identified within 1.5 km of the site.
- 10.10.12 Rainwater will be collected and retained within pools within the base of the restored area, and it is not proposed to install an outfall from the site. During recovery operations surface water run-off will be channelled into a site water management system. This will include a series of settlement lagoons to ensure adequate provision for silt settlement. Provision will exist within the system to contain any fuel spillage and it is therefore considered unlikely that the site will have an impact on off-site water quality. Direct surface water discharge from the site is not proposed.
- 10.10.13 Restoration will include revegetation of areas of bare colliery spoil, and so the potential for slight erosion of silts into the waterbodies will be removed. The impact on surface water quality at the site is considered to be slightly beneficial.

Flooding

- 10.10.14 The Application Area does not lie within any flooding zone as defined by the EA. It is not proposed that surface water discharge will occur across the site boundary. Therefore there will be no increase in downstream flood risk.

Effects on water-related ecology

- 10.10.15 The closest designated site is Llay Bog SSSI, which is located some 580 m to the southeast of the site. Given the significant distance and the limited impact of the proposals it is considered unlikely that the SSSI will be influenced by the proposed recovery operation. It is considered unlikely that the proposals will have any significant impact on the ecology supported by the River Alyn.

10.11 Hydrology summary and conclusions

- 10.11.1 The site lies to the west of the village of Cefn-y-Bedd, Wrexham and comprises an old sand and gravel quarry partially backfilled with colliery spoil. It is proposed to import inert fill material to return the site to beneficial agricultural land use with

areas of ecological improvement. The intention is to apply under the Environmental Permitting Regulations such that the operation is classed as a recovery activity.

- 10.11.2 The site is located on glacial sand and gravel which forms an unconfined aquifer. The solid geology beneath the site is the upper section of the Middle Coal Measures, known as the Bettisfield Formation, 400-520 m of productive Coal Measures comprising shales with interbedded sandstones and coal seams.
- 10.11.3 As part of the investigation 8 trial pits were excavated (16th June 2010) and 4 piezometers installed to allow on-going monitoring at the site. Colliery spoil was encountered in all trial pits with the exception of TP8. Spoil material was relatively uniform across the site comprising c60% fine-grained, dark grey/black material (clay and coal dust) plus angular fragments (<10 cm) of coal, shale and sandstone. The thickness of the spoil ranged from up to 80 cm in the low-lying areas of the quarry (TP1 and TP2) to over 4.4 m in TP7. The site investigation indicated that the groundwater table is likely to lie below the base of the colliery spoil.
- 10.11.4 There are no statutorily designated sites of ecological interest in the near vicinity of the site with the exception of Llay Bog SSSI 580 m to the southeast. Water-dependent ecology is likely to be present in the adjacent River Alyn and small seasonal ponds on the site and a larger permanent lake to the southeast; although these sites have not been statutorily designated. Water within the pond in the southern section of the site is considered likely to be in hydraulic continuity with groundwater within the sand and gravel.
- 10.11.5 The site is located adjacent to the deep valley (c15 m) of the River Alyn and under natural conditions groundwater flow in the sand and gravel is likely to be westwards towards the valley. Water levels are estimated to be between 1.3 mbgl and 3.2 mbgl in the western section of the quarry floor to c0.3 mbgl in the low-lying area associated with the pond in the south of the site. The site investigation indicated that the groundwater table is likely to lie below the base of the colliery spoil.
- 10.11.6 The site is not located within any groundwater Source Protection Zones (SPZs). The EA has indicated that there are no current licensed groundwater abstractions within

2 km of the site and the Environmental Department of Wrexham County Borough Council have no records of any private water supplies within the vicinity of the site.

- 10.11.7 The watertable is below the base of the site, therefore groundwater interaction with the infilled material will be limited. Rainwater will be collected and retained within pools within the base of the restored area, and it is not proposed to install an outfall from the site.
- 10.11.8 The Application Area does not lie within a zone liable to flooding as defined by the EA. It is not proposed that surface water discharge will occur across the site boundary. Therefore there will be no increase in downstream flood risk.
- 10.11.9 The Waste Acceptance Criteria imposed at the site and the implementation of a site water management system will help to ensure that the recovery operation does not have a significant impact on the surrounding water environment.

11 CULTURAL HERITAGE

11.1 Information obtained

- 11.1.1 The site is a former sand and gravel working from which material was extracted during the 1960s - 1970s. Any archaeological interest would have been destroyed during the winning of sand and gravel, which removed more than 5m of material. There is no visible evidence of any industrial archaeological interest at the site.
- 11.1.2 A document and online search was carried out to identify any archaeological interest at the site and the surroundings, none was found. The 1964 OS map based on the 1961 survey shows that mineral working at the site had not commenced. The railway link which previously served Llay Hall Colliery to the south of the site is shown as 'dismantled' by that time and so could not have been used for gravel working at the proposal site. Wat's Dyke is situated along the western boundary of the site. The National Monuments Record of Wales 'Coflein' website shows the main entry for Wat's Dyke, from the Royal Commission on the Ancient and Historical Monuments of Wales, which states:

‘A boundary bank, with a West facing ditch, running from the river Morda South of Oswestry (noted from the air beyond the South-most point depicted by OS) to Basingwerk on the Dee estuary (Fox, 1934). Associated with Offa’s Dyke (Nprn 306866) and its possible continuation, the Whitford Dyke (Nprn 306868), which run roughly parallel to the West. A radio-carbon date from Maes-y-Clawdd (South of Oswestry) gives a terminus post quem of AD486+-75 (Matthews, 2002). J. Wiles, 24.10.2002.’

11.1.3 No other archaeological features were identified in the Coflein data. The result of the search is presented in the figure.

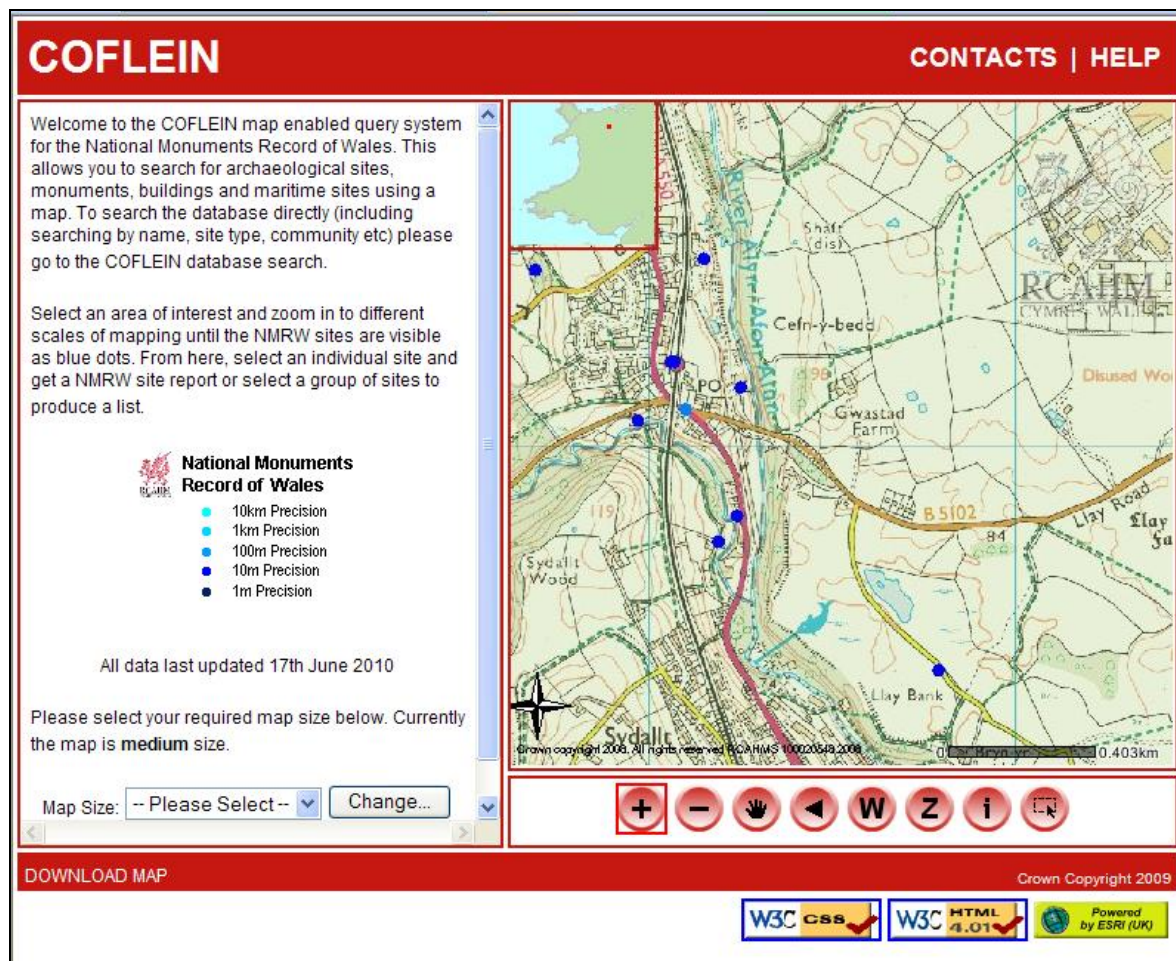


Figure 1 Coflein search made 02.07.2010 (O.S. Licence Number AL 10,000 4963).

11.2 Impact of proposed works

11.2.1 The proposal does not involve any further extraction of material from the vicinity of Wat's Dyke or the western boundary of the site, and so there is no likelihood that the Dyke would be affected directly.

11.2.2 The proposed filling would restore ground levels alongside the Dyke to levels similar to, or below, those believed to have been present before the mineral working. The appearance of the Dyke as an earthwork would not therefore be affected. Vegetation management would not affect the semi-mature trees which cover the Dyke.

11.2.3 The proposal would have no effect on any remaining interest in the local mineral railway sidings.

12 PEDESTRIAN AND VEHICLE ACCESS, ROADS AND RIGHTS OF WAY AND COMMUNITY EFFECTS

12.1 Rights of Way

12.1.1 The site does not have direct contact with any public rights of way such as footpaths or bridleways. Footpaths 17 and 18 converge and terminate at the northern edge of Llay Road, coming from the north-east (Gwastad Farm) and north, respectively as shown on Appendix 5A – Figure 1.

12.1.2 Pedestrian and vehicle access to the site is from Park Road which forms the eastern boundary of the site.

12.2 Community Effects

12.2.1 The proposals would not interfere with any legitimate community activity. Unauthorised motorcycle riding and shooting on the land would be prevented.

12.2.2 The site would be staffed during working periods by local employees of Moorbridge Construction, who would control materials movements and operate site plant. A minimum of two staff would be present in working periods, and so the proposed operation would safeguard local employment at a time when construction and building activity is uncertain.

13 TRAFFIC

13.1 Introduction

13.1.1 This assessment was undertaken to determine the likely impact of traffic serving the proposed land restoration operation.

13.1.2 Access is dependent on the source of the inert material. Transport is likely to be via the A541 (Mold – Wrexham) Road, turning east joining the B5102 Llay Road, and then turning south to join Park Road. Traffic from the east would travel westwards along the B5102 from Llay before turning south into Park Road.

13.1.3 The proposed site access, and the number of vehicles entering and leaving the site each day, is stated in sections 2.5 and 2.7 of this Statement. Drawings of the site access geometry are presented.

13.2 Method of assessment

13.2.1 A limited assessment has been conducted, to:

- Consider the access from the site onto Park Road
- Consider what happens should a HGV meet a vehicle on Park Road
- Consider the junction geometry and sightlines where Park Road joins Llay Road
- Consider the junction geometry and sightlines where the A541 joins the B5102
- Consideration of the anticipated number of vehicles serving the restoration operation

13.3 Findings

13.3.1 The northern site boundary is approximately 40 metres from the junction with the B5102, Llay Road and the site runs adjacent to Park Road for approximately 140 metres. All vehicle movements into and out of the site will be restricted to using the Llay Road junction. No vehicles will be allowed to approach or leave the site along Park Road south of the site entrance.

- 13.3.2 The proposed site access is to be located approximately 70 metres south of the Llay Road junction on the outside of a bend in Park Road. This will afford the best visibility for vehicles entering and leaving the site, as shown in Appendix 13 Photographs 1,2 and 3. The site entrance gateway will be set back from the highway far enough to allow lorries to park off the public highway whilst it is being opened, as shown in planning application Drawing 2909/06.
- 13.3.3 Visibility is such that an HGV driver would have sight to the junction with Llay Road when joining Park Road, and so could wait for any oncoming vehicle to pass. In the event that a vehicle turned from Llay Road into Park Road after the HGV had joined Park Road, there is an existing passing place on Park Road located some 40 metres from the Llay Road junction. At present the vegetation along the site boundary at that point is very overgrown, protruding at least 1 metre into the existing carriageway. It is proposed that all vegetation will be cleared back to at least 2 metres from the highway along that boundary, to improve visibility and restore the carriageway to its full surfaced width.
- 13.3.4 The site access will be visible from Llay Road, and the junction width is adequate for HGVs to turn into Park Road and wait should vehicles be approaching from the opposite direction (Appendix 13 – photo 4).
- 13.3.5 The junction of Park Road with Llay Road is on the outside of a slight bend giving good visibility in both directions (Appendix 13 – photo 5 & 6). The gradient of Park Road at its junction with Llay Road is not excessive, and HGVs leaving the site will mostly be unladen. There would be no difficulty for these vehicles to pull out into Llay Road.
- 13.3.6 Llay Road is of a standard suitable for all types of traffic. It forms the main link between the A541 and Llay and, for northbound traffic to Mold, is signposted as the route ‘avoiding low bridge’ indicating that it is the preferred route for larger vehicles. Southbound traffic on the A541 has a separate ‘left-turn’ lane to join Llay Road at the junction. This junction is considered suitable for HGV traffic serving the proposed site.

13.3.7 Incidental observation suggests that Llay Road is operating well within its capacity. Park Road is lightly trafficked at present and the positioning of the site entrance and the clearance of existing overhanging vegetation should ensure minimum disturbance to existing users. The junction with Llay Road has good visibility for turning and emerging vehicles, and so the proposed addition of traffic stated in Table 2 (chapter 2) serving the development is not expected to cause any significant impact.

14 CONSULTATIONS

14.1 Local residents

14.1.1 A letter, explaining the proposals and inviting comment or observations, was delivered personally to residents of the 10 properties nearest the site by the applicant during the first week of November 2010. Recipients were asked to respond within 7 days. The letter is reproduced as Appendix 14.

14.1.2 One response had been received by 1st December 2010. The respondent raised concerns over:

- Noise and air pollution from lorry traffic, affecting the business
- Applicant's ability to control the type of waste deposited
- Increased 'disturbance and pollution from vermin, flies, noise and dust'
- Risk of accidents as slow-moving lorries turn into and out of the access road or deposit mud on the road.

14.1.3 Each of these topics is dealt with in this supporting statement.

CHAPTER APPENDICES

5A	Landscape and visual impact figures	
5B	Landscape and visual impact photographs	
5C	Visual impact schedules	
6A	Phase 1 habitat plan	
6B	Ecology photograph sheets	
6C	Pond survey plan	
6D	Botanical survey NVC plan	
8	Noise modelling locations (figure 8 - 01)	
9A	Geology and soils Water and drainage	Figures 1 - 7
9B	Trial pit logs	
9C	Geology and soils Water and drainage	Photograph sheets
13	Highway photograph sheets	
14	Consultation letter	