BGL 3 – Environmental Risk Assessment Bespoke Environmental Permit for colliery spoil washing and recycling facility at Bersham (Glenside) Ltd – Bersham Colliery, Colliery Road, Bersham, Rhostyllen, LL14 4EG

As part of an application for an environmental permit Operators must assess the risk to the environment and human health from the activities they seek to permit.

Environmental risks relevant to the proposed activities are:

- Emissions to Air;
- Emissions to Water;
- Emissions to Land;
- Odour;
- Noise;
- Litter;
- Pests;
- Vandalism;
- Fire; and
- Incompatible Feedstock.
- Flood
- Protected Habitats

For each of the above environmental criteria the approach to the assessment has followed the following four stage process:

- Identify the risks;
- Assess the risks (assuming those control measures proposed are in place);
- Choose appropriate further measures to control these (if required); and
- Present the assessment.

Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequences	Overall Risk (following mitigation)
Emissions to land	Groundwater /Geology / Surface Water/ Secondary Aquifer	Water borne	• There are no point source emissions to ground waters. • All washing activities will take place on an impermeable surface forming part of a sealed drainage system. • The concrete pad drains to a sump and remains at a low level, as water is required within the wash plant as water is lost to evaporation from washed aggregates and coal and remains within the filter cake. As a result, water is constantly pumped to the plant. • Crushing and screening activities will produce no runoff. • The concrete pad will also feature a geo textile membrane to prevent migration of liquids to the groundwater. • There will be no hazardous wastes delivered to site. • Spill kits will be strategically located around site. These are subject to regular checks in the planned preventative maintenance system. • The wash plant employs a water treatment facility that aims to remove suspended solids from the wash waters to use them again within the washing process. • Part of the water treatment process is the 'pressing' of the thickened sludge via pressing in a filter press. This produces a filter cake that will still contain some moisture. The filter cake is dropped from the press onto the sealed concrete pad. Any runoff is again captured in the sump. The cake is stored on concrete pad until it is removed from site for use in recovery projects or disposed of in a landfill. • If in the event of additional liquid capacity being required a tanker would be employed to remove the liquids to a permitted waste facility. This would also happen when the water treatment system is cleansed for maintenance or contamination is observed or identified during testing. • Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal at an appropriate facility. EA to be informed. • The anionic flocculent is stored in powder form in 20kg bags and is added to an automatic mixing and dosing system to make up a small batch of liquid solution which is then dosed into the thickener, also the flocculent will be stored within the water treatment plant on the sealed drainage system. As a result there is no secondary containment required for a bulk 1,000 litre IBC of premixed solution common on other wash plants. • The use of a road sweeper on the main road outside the site will remove any debris that may not have been removed by the	Low: all runoff is controlled and contained on site, therefore the probability of exposure is low	Contamination of groundwater and Secondary aquifer	**VERY LOW** due to the proposed management techniques and drainage arrangement

			wheel wash, this will prevent any run-off to surface water drains and watercourses. • The wash plant and mobile plant for loading requires oils, grease and fuel to operate. None of these potentially polluting liquids are stored within the permitted area. • The quarantine area will be located on the sealed concreate pad and within the sealed drainage system. This area will stay clear from waste. In the event of any waste, that requires quarantining; it will be stored in the area and fenced off to prevent mixing with other wastes. • There are no plans for secondary containment as the sealed drainage system acts as containment for any run-off. This includes surface water and rainwater as the washing process is a water negative process due to evaporation and moisture within the washed materials and filter cakes. All collected water is pumped to the water treatment system for the washing process.			
Emissions to water	Surface Water / River Dee catchment	Drains, waterways and hard surfaces via runoff	• The wash plant is located on an impermeable concrete pad as part of a sealed drainage system. • The concrete pad drains to a sump which has a capacity of 4m³ and remains at a low level as water is required within the wash plant as water is lost to evaporation from washed aggregates and coal and remains within the filter cake. As a result, water is constantly pumped to the plant. • Crushing and screening activities will produce no runoff. • There will be no hazardous wastes delivered to site. • The wash plant is located on an impermeable concrete pad which drains to a sealed sump. The pad will be constructed on top of geo-membrane. This provides the sealed drainage system. • Spill kits will be strategically located around site. These are subject to regular checks in the planned preventative maintenance system. • The wash plant employs a water treatment facility that aims to remove suspended solids from the wash waters to use them again within the washing process. • Part of the water treatment process is the 'pressing' of the thickened sludge via pressing in a filter press. This produces a filter cake that will still contain some moisture. The filter cake is dropped from the press onto the sealed concrete pad. Any runoff is again captured in the sump. The cake is stored on concrete pad until it is removed from site for use in recovery projects or disposed of in a landfill. • If in the event of additional liquid capacity being required a tanker would be employed to remove the liquids to a permitted	Low: spills / leaks could potentially pollute the local watercourses namely the River Dee Catchment.	Pollution of the local watercourses namely the River Dee Catchment.	**VERY LOW** due to the proposed risk management techniques

			waste facility. This would also happen when the water treatment system is cleansed for maintenance or contamination is observed or identified during testing. • Minor spills to be cleaned up immediately using spill kits. Resultant materials to be placed in container for offsite disposal to appropriate facility. • Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal at an appropriate facility. EA to be informed. • There will be no point source emissions to land arising from the proposed facilities. • The anionic flocculent is stored in powder form in 20kg bags and is added to an automatic mixing and dosing system to make up a small batch of liquid solution which is then dosed into the thickener, also the flocculent will be stored within the water treatment plant on the sealed drainage system. As a result, there is no secondary containment required for a bulk 1,000 litre IBC of premixed solution common on other wash plants. • Spill kits will be strategically located around site. These are subject to regular checks in the planned preventative maintenance system. • Staff will be trained in how to deal with a spill. • Minor spills to be cleaned up immediately using spill kits. Resultant materials to be placed in container for offsite disposal to appropriate facility. • Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal at an appropriate facility. EA to be informed. • The wash plant and mobile plant for loading requires oils, grease and fuel to operate. None of these potentially polluting liquids are stored within the permitted area. • Road sweepers will be made available to clean roads within the site and outside this being the main pathway to watercourses. The quarantine area will located on the sealed concreate pad and within the sealed drainage system. This area will stay clear from waste. In the event of any waste that requires quarantining it will be stored in the area and fenced off to prevent mixing with other wastes. • There are no plans for secondary containment as the sealed drainage system acts as containment for any run-off. This includes surface water and rainwater as the washing process is a water negative process due to evaporation and moisture within the washed materials and filter cakes. All collected water is pumped to the water treatment system for the washing process.			

Noise and vibration Existing permitted activities including new wash plant	Local Residents and wildlife Closest residents Closest sensitive receptor Plas Grono Farm located approximately 183 metres east	Airborne / ground	• The wash plant will be located behind the existing primary aggregates wash plant. • Vehicle deliveries will only take place during daytime hours. • On site, vehicles will be fitted with 'white noise' reversing alarms. • No activities will take place at night • Speed limits in place of 5mph to reduce noise generation on the access roads. • Access roads to be kept in good order to prevent potholes that may give rise to noise incidents. • Where possible vehicles will be reloaded with recycled materials when leaving the site meaning less vehicle movements and reduced empty vehicle bodies which can produce noise. • The permitted area flacked by the former colliery tip to the North and West proving a noise barrier. • All loading and un-loading will take place within the quarry walls, therefore reducing noise leaving the site boundary. • Stockpiles of waste will always be lower than the quarry walls, therefore loading and unloading will be behind the bund. • The plant sits behind the colliery mound. • A preventative maintenance system is implemented, which covers all plant and equipment, including the wash plant. This will ensure no deterioration of plant or equipment that would give rise to increases in noise generation. • All equipment has been designed to ensure that any noise does not present an issue to the employees at the site under the Control of Noise at Work Regulations. • Crushers and screens will be maintained to be prevent noise associated with poor maintenance. • All exhausts are fitted with silencers. • All vehicles and equipment will be switched off when not in use and not allowed to idle. • The site operates a complaints investigation procedure which involves efficient mitigation if a complaint is found to be substantiated. All complaints are recorded and reviewed regularly. • The distance between stockpiles of recycled materials and vehicles to be loaded is kept to minimum to reduce vehicle movement. • Sensitive receptors have been identified. • Wash plant conveyors are adjustable to reduce the drop height of washed aggregates. Reduced drop height will reduce noise. • Training will be provided for all staff operating the site. This training will include noise mitigation measures. • In the event of an increase in noise complaints a noise impact assessment would be carried out. • The site will operate as a recycling facility from 07:30 – 17:30 Monday to Friday.	Low – due to the mitigation methods taken, the operation sitting within existing quarrying and aggregate washing site and the mitigation measures described.	Nuisance in the form of noise and vibration	**VERY LOW** due to the management techniques, modern equipment, maintenance and quarry walls acting as noise barrier and existing quarrying and washing activities.

			08:00 – 13:00 Saturdays Closed Sundays • The noise impact assessment recommends a noise barrier will be placed around the wash-plant and this will be constructed before the plant is active.			
Odour	Local Residents at 190m to the NE of the site boundary	Airborne	• Colliery spoil wastes are not commonly odorous. • To prevent excessively odorous waste from arriving on site, the site has stringent waste acceptance procedures waste will be rejected by site should it be deemed malodourous. • Inspections will happen daily to inspect the site for odours. Any odorous waste will be prepared for removal off site immediately. • Sumps will be regularly cleaned and the site will emptied good housekeeping measures. • Any complaints will be actioned in accordance with the site complaints procedure and recorded in the site diary.	Low: due to the activities being managed by odour management techniques	Nuisance	**VERY LOW** due to the proposed risk management technique
Dust	Local Residents Local Residents at 190m to the NE of the site boundary	Airborne	• All loaded incoming and exporting vehicles will be covered. • Road sweepers will be made available to clean roads within the site and outside. • Water Bowsers will be deployed in dry weather to dampen down. • Screens will have dust suppression installed. • Washed aggregates contain significantly less dust resulting in less dust being blown from stockpiles. • Any complaints will be actioned in accordance with the site complaints procedure and recorded in the site diary. • Operations likely to generate dust will not be carried out in high winds. • All operations will be in line with the Dust Management Plan. • The site has a wheel wash installed. • The main haul road after the wheel wash is made of concrete and can easily be cleansed. • Dust emissions will be managed via a dust management plan. • Crushing and screening equipment will be equipped with 'dust hoods' and sprinkler bars.	Low: due extensive dust suppression equipment and methods being employed	Nuisance	**VERY LOW** due to the proposed risk management techniques
Litter	Local Residents Local Residents at 190m to the NE of the site boundary	Airborne & migration	• All incoming and exporting waste vehicles will be covered. • Feedstock containing litter would be deemed unsuitable and rejected. • The site access and the Colliery Road shall be swept as necessary. • The site shall be inspected daily by the site manager and any litter or accumulated debris shall be dealt with immediately. • Any complaints will be actioned in accordance with the site complaints procedure and recorded in the site diary • Litter will be picked on a weekly basis.	Low: due to feedstock being assessed for litter	Nuisance	**VERY LOW**
Pest	Local Residents Local Residents at 190m to the	Airborne and migration	• The waste types do not attract pests. • Should pests be identified, reasonable measures will be taken to use commercially available products and services to control pests.	VERY Low risk of pets on site is possible	Nuisance	**VERY LOW** due to proposed risk management techniques

	NE of the site boundary					
Vandalism	Operator	The site could be subject to intentional vandalism and damage by intruders / trespassers who could cause damage or harm to the site or cause fires.	• The site has a CCTV system. • The site entrances are secured by lockable gates. • Site is secure and the entire site is bounded by fencing. • Unauthorised access is prohibited onsite. • The site perimeter is inspected daily by operations staff to identify deterioration and damage and the need for repair. • Fencing is maintained and repaired to ensure its continued integrity. If damage is sustained, repair will be made within the same working day. If this is not possible, suitable measures will be taken to prevent unauthorised access to the site and permanent repairs will be affected as soon as is practicable. • All visitors to the site are required to register in the visitor's book and sign out again on exit, thereby minimising the risk of unauthorised visitors on the site.	Low: the occurrence of vandalism taking place on site is highly unlikely	Nuisance, damage or fire	**VERY LOW** due to the proposed risk management techniques
Fire	Operator / Residential Properties	Windborne	• The site will not accept flammable wastes. • Wastes processed on the site are not combustible. • A planned preventative maintenance system is in operation for all plant and equipment. This will reduce the likelihood of fire starting at this source.	VERY Low: the occurrence of a fire taking place	Fire	**VERY LOW** Due to lack of combustible waste
Incompatible Feedstock	Operator / Residential Properties	If incorrect waste is accepted on site it could result in adverse emissions/ breaking of equipment	• All wastes accepted onto site have been subject to 'pre-acceptance' in accordance with the sites Environmental Management System. • Waste acceptance procedures are implemented, which control all incoming wastes. • Any non-conforming waste will be quarantined and rejected from site in accordance with the sites Environmental Management System and waste acceptance procedures. • The quarantine area will be on sat on the sealed concreate pad and within the sealed drainage system. This area will stay clear from waste. In the event of any waste that requires quarantining it will be stored in the area and fenced off to prevent mixing with other wastes.	Low: off-site receptor impacts	Nuisance /Adverse Emissions	**VERY LOW** due to the proposed risk management techniques
Flooding	Operator	Surface and coastal waters	• There are no plans for secondary containment as the sealed drainage system acts as containment for any run-off. This includes surface water and rainwater as the washing process is a water negative process due to evaporation and moisture within the washed materials and filter cakes. All collected water is pumped to the water treatment system for the washing process. • The site is not located within a flood zone	Low: off-site receptor impacts	Flooding	**VERY LOW** due to the proposed processes and management techniques as described within the summary EMS The site is not located within a flood zone

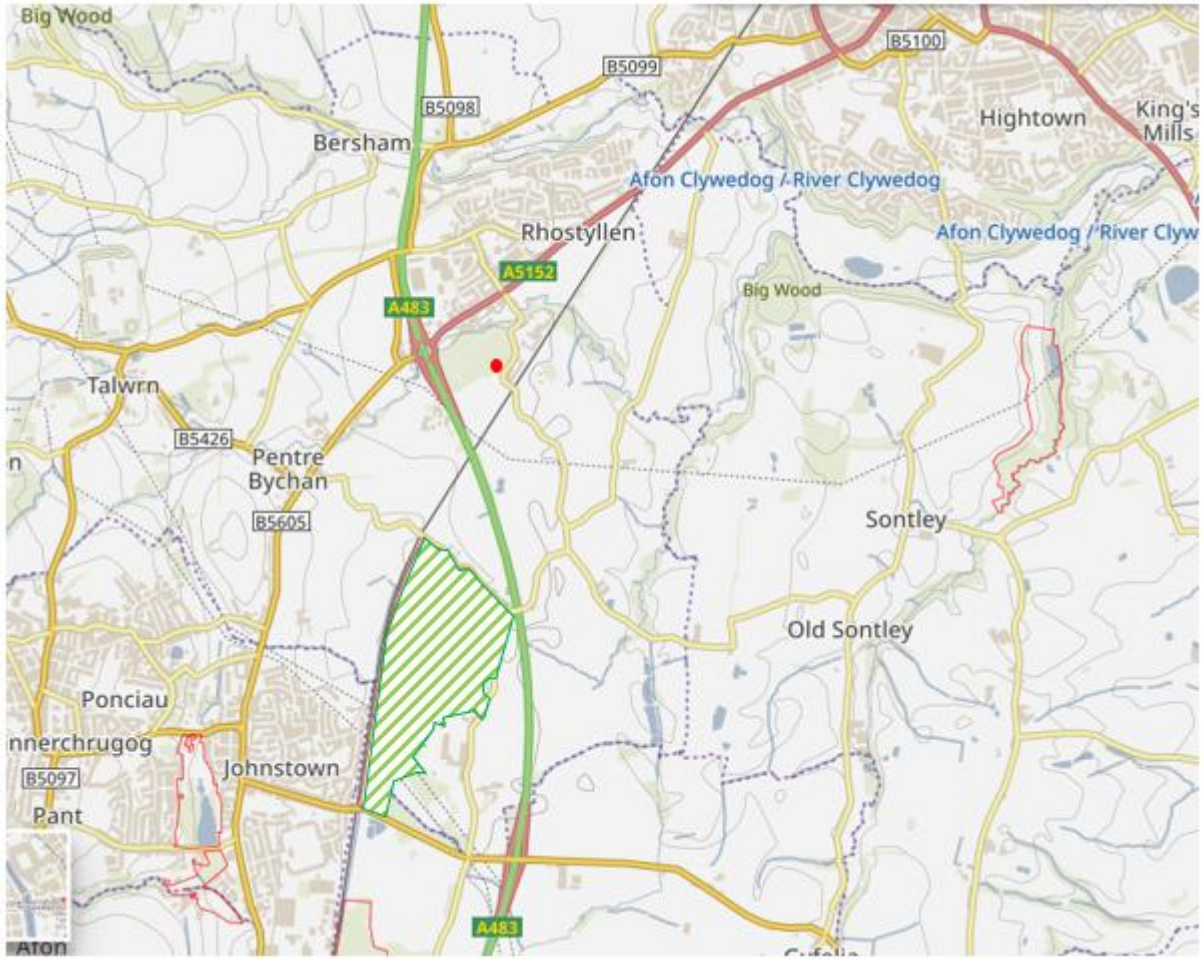
Proposed permitted boundary in relation to flood zones of the

Stryt Las a'r Hafod at Bonc yr Hafod Country Park Site of Special Scientific Interest (SSSI).

Hazard	Receptor	Reason for designation	Pathway to site	Risk Management Techniques	Probability of Exposure to site	Possible Consequences	Overall Risk (following mitigation)
Site activity of crushing, screening and washing waste colliery spoil	Biological SSSI **Stryt Las a'r Hafod at Bonc yr Hafod Country Park**	**Description**: Stryt Las a Hafod is a composite site located close to the village of Johnstown, south west of Wrexham, at an altitude of 130m. It is of special interest for its amphibians. Of particular interest is the population of the great crested newt Triturus cristatus. This species has suffered a marked decline throughout Great Britain and Continental Europe as a result of habitat loss. Great Britain is considered to be one of the strongholds for this species in western Europe. **Remarks**: The Bettisfield Formation feldspathic sandstone and coal measures underlie the site and a number of capped mine shafts are present within the boundaries of the site. Where present, natural soils are of over consolidated till (boulder clay) origin. The majority of the water bodies originated following the cessation of mineral extractive industries including coal mining and quarrying for clay and associated industrial developments. Certain ponds, particularly at Hafod, were specifically created for amphibian conservation purposes. The water bodies at Stryt Las and Hafod support one of the largest known breeding populations of the great crested newt in Great Britain. Torch night counts undertaken during the spring have revealed over 250 adult and sub-adult animals on several occasions. They also support significant populations of the commoner amphibian species notably smooth newt Triturus vulgaris, palmate newt T. helveticus, common frog Rana temporaria, and common toad Bufo bufo. Surrounding areas of land support a mosaic of scrub and planted trees, grassland, and tall ruderal vegetation. These form important foraging and over wintering areas for adult and juvenile amphibians..	Dust arising from the site would be airborne. Migration of Great Crested newts to the permitted area	-Dust management and mitigation methods referenced under the Dust section of the Environmental Risk Assessment above. - Due to the nature of the waste being handled on this Site the particle size of the dust emitted is of intermediate to large particles. Therefore, it can be concluded that these particles are highly likely to be deposited within 50m of the source and will not reach the SSSI. -For standard rules permits for aggregate and soil recycling the following risk assessment is applied '250 metres within the presence of Great Crested Newts where it is linked to the breeding ponds of the newts by good habitat - The maximum dispersal distance of great crested newts is roughly 1km, but the average is approximately 250m (Griffiths 2004). Connectivity between occupied ponds is vital to maintaining sustainable meta-populations (source Natural England) -The site is proposed permitted area is located over 750m to the Southwest from the proposed permitted boundary. -There are two major barriers to migration of Great Crested Newts to the site namely -The A483 dual carriage way -Rail line The sites current condition is not suitable habitat for Great Crested Newts -The site will erect new fencing to the southern and western boundaries to prevent migration onto the site	Very Low: The site is located 750m from the site with any dust being produced evading mitigation methods dropping out within 50m. The major barriers to migration namely the –The A483 dual carriage way -Rail line would prevent Great Crested Newts interacting with the permitted area	Impact on the Great Crested Newts	**VERY LOW** due to the proposed site mitigation and barriers to migration.

				-Ecological assessment of the wider former colliery site have found no great crested newts			

Location of Stryt Las a'r Hafod at Bonc yr Hafod Country Park Site of Special Scientific Interest (SSSI).

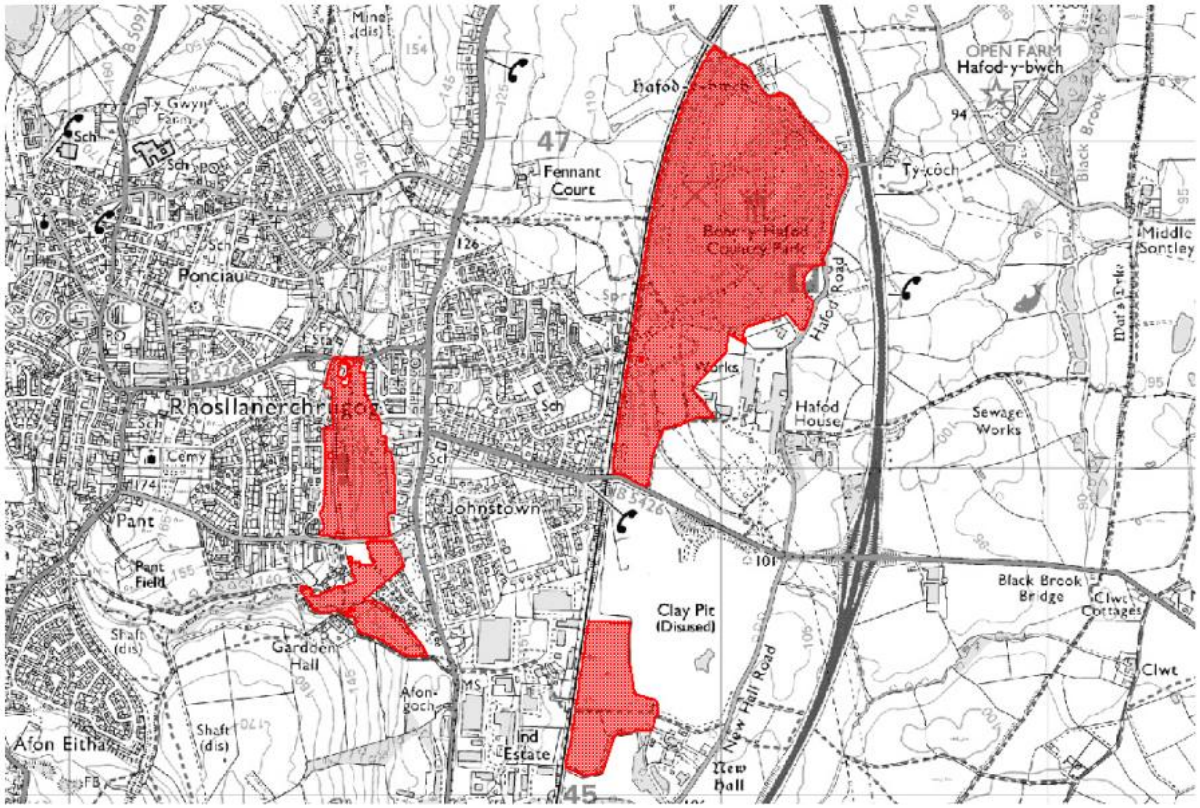


Johnstown Newt Sites Special Area of Conservation (SAC) EU SAC Code UK0030173

Hazard	Receptor	Reason for designation	Pathway to site	Risk Management Techniques	Probability of Exposure to site	Possible Consequences	Overall Risk (following mitigation)
Site activity of crushing, screening and washing waste colliery spoil	Johnstown Newt Sites Special Area of Conservation (SAC) EU SAC	The site supports a breeding population of over 300 adult great crested newts as identified by torch surveys in the spring. The population of newts is stable or increasing, with at least 30 display/breeding ponds present across the site. Native macrophyte plants cover many of the ponds, but at least 40% of the surface remains as open water. Fish are absent from all breeding/display ponds which support great crested newts, and wildfowl are only seen in small numbers. No non-native aquatic species will be present in any of the ponds. Tall vegetation surrounds the ponds, but it does not lead to excessive shading of the water body. The current vegetation, together with fallen trees, and large stones provides refuge areas for the newts during the day as well as suitable foraging areas, and hibernation places for amphibians. Great crested newts disperse between the ponds using a network of corridors, formed by hedgerows and rough grasslands, together with habitats, such as ponds or scrub, that function as stepping-stones. Between sites, new surface water management systems will be amphibian friendly and will therefore not hinder newt dispersal. Ponds exhibiting a range off seral conditions will occur throughout the site. Recreational activities will be sympathetic to newt conservation and consequently, individuals will no longer be able to utilize the site for off roading or fishing purposes. All section of the local community will be aware of the ecological value of the site and of the implications caused by the introduction or transference of fish between ponds.	Dust arising from the site would be airborne. Migration of Great Crested newts to the permitted area	-Dust management and mitigation methods referenced under the Dust section of the Environmental Risk Assessment above. - Due to the nature of the waste being handled on this Site the particle size of the dust emitted is of intermediate to large particles. Therefore, it can be concluded that these particles are highly likely to be deposited within 50m of the source and will not reach the SSSI. -For standard rules permits for aggregate and soil recycling the following risk assessment is applied '250 metres within the presence of Great Crested Newts where it is linked to the breeding ponds of the newts by good habitat - The maximum dispersal distance of great crested newts is roughly 1km, but the average is approximately 250m (Griffiths 2004). Connectivity between occupied ponds is vital to maintaining sustainable meta-populations (source Natural England) -The site is proposed permitted area is located over 750m to the Southwest from the proposed permitted boundary. -There are two major barriers to migration of Great Crested Newts to the site namely -The A483 dual carriage way -Rail line -The sites current condition is not suitable habitat for Great Crested Newts -The site will erect new fencing to the southern and western boundaries to prevent migration onto the site	Very Low: The site is located 750m from the site with any dust being produced evading mitigation methods dropping out within 50m. The major barriers to migration namely the –The A483 dual carriage way -Rail line would prevent Great Crested Newts interacting with the permitted area	Impact on the Great Crested Newts	**VERY LOW** due to the proposed site mitigation and barriers to migration.

				-Ecological assessment of the wider former colliery site have found no great crested newts			

Location of Johnstown Newt Sites Special Area of Conservation (SAC) EU SAC Code UK0030173

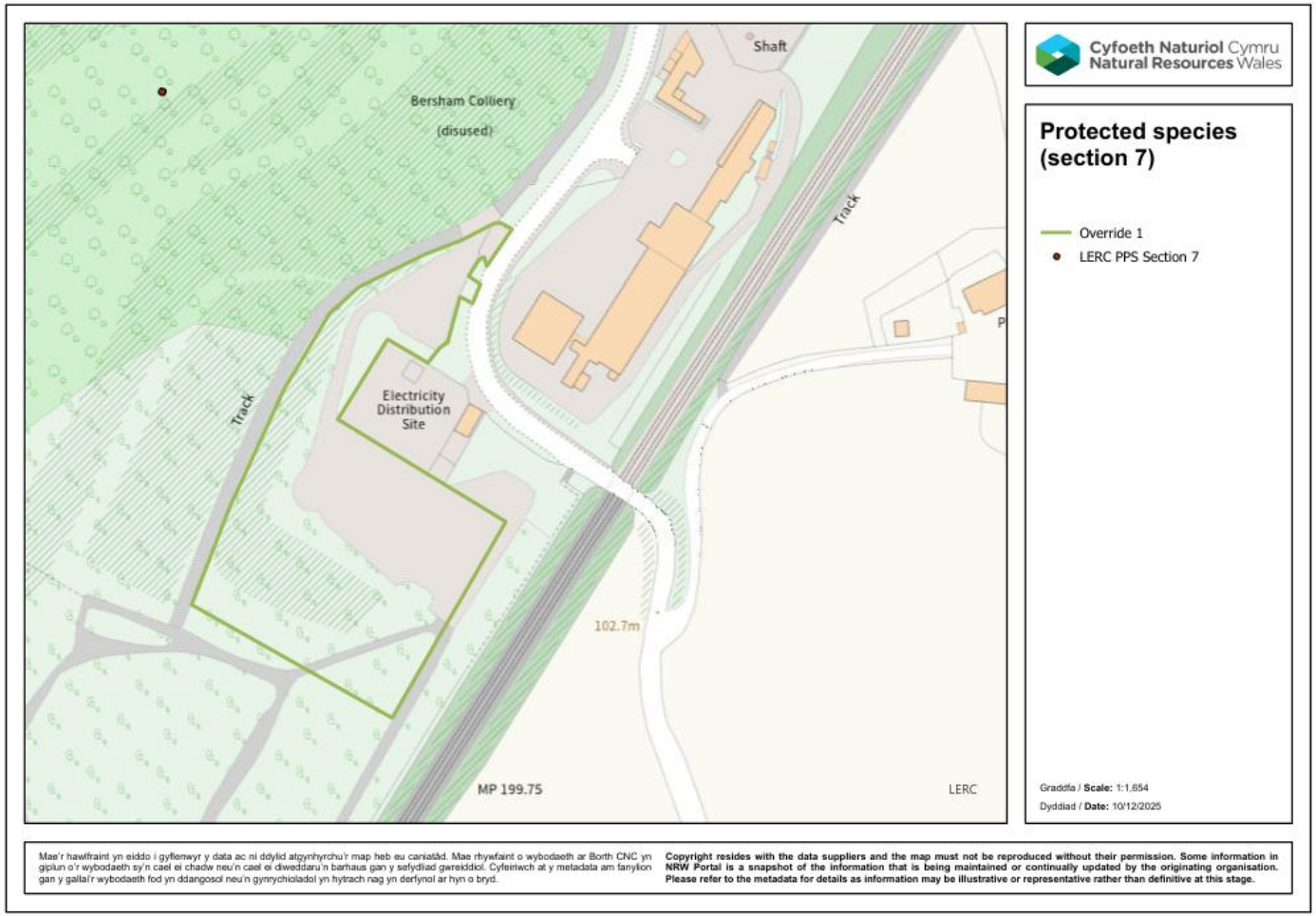


Protected Species – Tyrie jacobeae – Cinnabar Moth

Tyrie jacobeae, Cinnabar moth) is located close to the permit boundary and is located 87 meters northwest on the Bersham Coil Tip (see map provided).

NOTE: The former colliery spoil heap has been stripped of vegetation as part of the planning permission that has been gained after an extensive ecological survey. As a result the habitat and foods source (ragwort) has been removed and the associated risk is no longer present.

Hazard		Receptor	Reason for protection	Pathway to site	Risk Management Techniques	Probability of Exposure to site	Possible Consequences	Overall Risk (following mitigation)
Site activity of crushing, screening and washing waste colliery spoil		Cinnabar Moth *Tyria jacobaeae*	This species is so named due to the colour of the hindwings and the markings on the forewings which make it unmistakeable. There is little variation although on rare occasions the pinkish markings are replaced with yellow, or the forewing is red with a black border or the wings are completely black. Easily disturbed by day and flies in sunshine. Also flies after dark. All section of the local community will be aware of the ecological value of the site and of the implications caused by the introduction or transference of fish between ponds. **Conservation status** • UK BAP: Priority species (Research only) • Common	Dust arising from the site would be airborne.	-Dust management and mitigation methods referenced under the Dust section of the Environmental Risk Assessment above. - Due to the nature of the waste being handled on this Site the particle size of the dust emitted is of intermediate to large particles. Therefore, it can be concluded that these particles are highly likely to be deposited within 50m of the source and will not reach the habitat. -Ecological assessment of the wider former colliery site was part of the planning permission to remove the spoil heap. -The existing habitat has now been removed	Very Low: due to dust management and mitigation methods.	Impact on the Cinnabar Moth *Tyria jacobaeae* and its food source Ragwort	**VERY LOW** due to the proposed site mitigation and the habitat being removed with planning permission after an ecological survey.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