



Appendix 3.13

Ground Conditions Technical Review (July, 2022)

BARRY BIOMASS PLANT

Technical Review: Ground Conditions
Prepared for: Biomass UK No.2 Limited

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1.0 Introduction

SLR has been retained by Biomass UK No.2 Limited to review the available information on Ground Condition matters in relation to the Barry Biomass Facility (the Facility) located in Barry, South Wales. The aim of the review is to identify and address potential issues and/or gaps in the information that in our professional opinion would be required to support the submission of the Environmental Statement (ES) prepared as part of an Appeal against the Enforcement Notice issued by Vale of Glamorgan Council.

Specifically, our review provides the justification to screen out Ground Condition from the ES.

1.1 Description of Development

The development is a renewable energy generation facility (Barry Biomass Facility) which has been designed to recover energy from pre-prepared mixed waste wood feedstocks using gasification. The gasification facility is an Advanced Thermal Treatment process that produces a combustible synthesis gas, which is then used to raise steam and generate electricity through a steam cycle turbine generation.

1.2 Location and Surrounding Area

The Barry Biomass Facility is located off Woodham Road, Barry, Vale of Glamorgan at NGR ST 12605 67691. The Site location is shown by Drawing BARRY-01-DWG-01-20000.

The development is located within the docks area of Barry on brownfield land immediately adjacent to industrial units on Woodham Road to the south west and Viaduct Road to the north east. The site is roughly rectangular, averaging approximately 60m in width, by 195m in length and the red line encloses an area of 1.07 hectares (ha) the site is oriented roughly north-west/south-east. The land is flat, and prior to development was surfaced with a mixture of hardcore and compacted earth, with some areas of concrete with little vegetation evident on the site.

The site is bound by David Davies Road to the south and Ffordd-y-Mileniwm to the north. The eastern extent of the Barry Waterfront development is located approximately 200m to the west of the Installation and Dow Corning Chemical Works complex is located approximately 1km to the north east.

The Site has one entrance off David Davies Road. Access on to the surrounding road network is gained via Cory Way onto Ffordd Y Mileniwm. The site is fully developed, with the construction of the Barry Biomass Facility taking place between February 2016 and Q1 2018.

The original application boundary excluded the area of hardstanding at the northern end of the site denoted as '12 - Vehicle Turning Area' on Drawing BARRY-01-DWG-01-20000. This assessment considers the cumulative impact on Ground Conditions of both parcels of land.

2.0 Note Structure & Approach

2.1 Summary Approach

The overall risk-based approach to the assessment and management of ground conditions, particularly potentially contaminated land in Wales and the governing regulations have not substantially changed over the period of time from the granting of planning permission in 2010 through to 2022.

In 2015 when the work to address planning conditions was undertaken relevant guidance was:

- “Development of Land Affected by Contamination: A Guide for Developers. prepared by the Welsh Local Government Association (WLGA) & Environment Agency Wales” and dated 2012.

The guidance was prepared and issued to provide a reference document for developers and their advisers who may be involved in the assessment and management of land contamination. It detailed the type of information required by the Local Planning Authority (LPA) in order for them to assess an application for planning permission on brownfield land, in particular, where contamination may be present.

The format and layout of the WLGA guidance documents has evolved; with a revised version of the guidance published in 2017 and new guidance on specific technical matters has since been introduced. However, the process and in particular the Land Contamination Decision Frameworks presented in an Appendix to WLGA guidance in all versions of the document has not changed. In summary, the procedure to assess whether or not land is contaminated remains unchanged. Further to this, the lines of evidence required to be demonstrated in relevant reports submitted to the regulators to discharge or comply with land contamination planning conditions has not changed since 2010 over the duration of the Barry Biomass scheme.

2.2 Reports Reviewed

The assessment of Ground Conditions has been completed on the basis of a review of the following reports (numbered 1 to 3) prepared in relation to ground conditions for the development of the site:

1. Phase I - II Geoenvironmental Report For Land Off Woodham Road, Barry, CG63 4JE. Prepared by CG Geotechnical Limited for Stopford Projects. Report dated November 2015. Report Ref: CCG-C-15-8605-5.
2. Barry Biomass Remediation Strategy. Prepared by WSP Parsons Brinckerhoff. Reported dated April 2016. Project No: 70020387.001.
3. Barry Biomass Verification Report. Prepared by WSP Parsons Brinckerhoff. Reported dated August 2016. Project No: 70020387.001.
4. Site Condition Report, Energy Recovery Facility, EPR Permit Application for Biomass UK No.2 Ltd. Sol Environmental. Project Issue Number: SOL1605BUK201. Dated October 2016.

- Phase I - II Geoenvironmental Report (November 2015)

This report states that it was prepared to:

“provide environmental and geotechnical data relevant to the planning, design and construction of the project, and to form part of the package of documentation submitted with the formal planning application, such that this report and the relevant supplementary data referred to in Table 23¹ herein may obviate the requirement for conditions relating to Phase I/ Phase II conditions in the planning consent.”

The area of the site described by the report extended to the red-line boundary of the 2015 Planning Application. The report makes no reference to the land at the extreme north of the Facility which is currently used as a vehicle turning area.

SLR has reviewed the Phase 1 and Phase II report and would conclude that it can be considered to map to the steps outlined in Site Characterisation and Risk Assessment as defined in the WLGA Guidance.

2.2.1 Phase 1 Report

SLR has undertaken a detailed evaluation and mapping of the submitted report to the WLGA procedures is presented in Table A1 in the Appendix 01. Based on this review and further evaluation of the evidence base SLR would comment as follows:

- The report is appropriately structured.
- There is a good description of the pre-development site condition as observed during its walkover.
- There is a thorough review of historical mapping and the addition of a UXO appraisal is a strength.
- The lack of consultation of local authority records is understandable as the local authorities do not always have particularly accessible or useful records, particularly on sites that have remained unchanged for longer periods of time.
- There are parts of the evidence included in the Phase I and Phase II report that could have been presented or developed in further detail to clarify the conceptual site model and improve understanding of the limited risks posed by potential contaminants on or beneath the Facility. In particular:
- Prior to construction of this part of Barry Docks in the 1890s, the site was formerly occupied by the tidal flats cut through by the Cadoxton River channel.
- The site was reclaimed from the tidal flats by placement of made ground in the 1880s and 1890s; with construction of railway tracks on embankments running to coal truck tippers on the dock side. It is considered likely that the fill materials used to create the landform was locally sourced as-dug natural material and not imported contaminated spoil. The rail embankments remained until at least the 1970s; the storage and running of railway wagons containing coal are unlikely to have shed notable quantities of contaminant onto the ground surface. Small quantities of coal, coal dust, and grease or similar viscous hydrocarbon oil might be anticipated. In terms of potential contaminants of concern from this source, metals, non-metals and ground gases might be present as summarised in Table 7 of the 2015 report.
- The south-western corner of the Facility (an area around 40m x 20m) previously contained one or more buildings in a commercial use; labelled as an Engineering Works (1971) and later a Builders Yard in the (1980s). Based on site history, asbestos could also be present as a result of any more recent fly tipping.
- The proposed development of the Facility would not introduce any particularly sensitive receptors on the site. The presence of impermeable surfacing or buildings across the Facility would break any pathway

¹ In fact Table 23 contained details of pile carrying capacity. It is more likely that the reference was to Table 24: Conclusions and Recommendations

for site users or works to come into contact with solid particles of contaminant including dusts. Similarly, the impermeable surfacing would prevent any leaching of contaminants to the groundwater receptor, including both current sub-surface contaminants and from any future residues or contaminants from the operation of the Biomass plant. In addition, the development and operation of the Facility would not present Ground Contamination risks to other sites, including more sensitive residential developments in the Barry Waterfront area.

Whilst it is noted that vehicle turning area at the northern extent of the Facility (Area 12 on Drawing BARRY-01-DWG-01-20000) was not assessed in the Phase 1 report, the historic use of the area occupied appears identical to the larger remainder of the Facility : it was formerly occupied by the tidal flats to the north side of the Cadoxton River channel in 1878-79. It was developed and crossed by rail lines on embankments feeding coal tips in Barry Dock No.2, and appeared unchanged until at least the 1970s. There are no lines of evidence to suspect that contaminant sources, pollutant linkage or risks are different to the adjacent consented site.

2.2.2 Phase II report

SLR has undertaken a detailed evaluation and mapping of the Phase II elements of the submitted report to the WLGA procedures and this is presented in Table A2 in the Appendix 01 to this note. Based on this review and further evaluation of the evidence base SLR would comment as follows:

- Overall, the site investigation findings indicate that with the exception of asbestos, no contaminants of concern were identified at concentrations exceeding their generic assessment criteria. These results for the majority of the site are consistent with the conceptual model where the historic placement of made ground on the tidal flats at the site to facilitate construction of railway lines did not introduce potential contaminants of concern.
- The site investigation plan was a simple distribution of investigation locations across the site; there was no apparent targeting of the south-east corner of the site where more varied and potentially more contaminative land uses had occurred.
- Nevertheless, the absence of organic and inorganic contaminants of concern in groundwater in the three monitoring wells installed and sampled (from BH3, BH4 and BH5) with BH5 centred in the south-east corner, provides assurance of the absence of groundwater impact from historic and more recent site uses.
- It would have been beneficial to sample soils at greater depth within the made ground; the near surface sampling potentially preferentially targeted soils that would be removed during development and did not provide sufficient confirmatory characterisation of soils beneath the new facility. However, as identified above the deeper made ground was not likely to be different in terms of its contaminant impact and, similarly, the results of both ground gas monitoring and groundwater sampling did not indicate any deeper contaminant sources.
- Section 25 of the report recommends that concrete driven piles are utilised for foundations. The report also states that use of this technique is beneficial as it reduces the requirement to manage groundwater, excavation stability and minimises the generation of soil arisings for disposal. No consideration is given however to the risks to deeper groundwater from installation of the piles and whilst risks would appear to be low discussion of this aspect would have strengthened the report findings.

The conclusions of the report in relation to pollutant linkages and risks could have been strengthened by a discussion of the results in the context of the conceptual site model to confirm that historic land uses were not notably contaminative and to close out a number of the potential pollutant linkages outlined in Table 9. Nevertheless, with the exception of near-surface asbestos identified, contaminant impact appears to be low and acceptable in the context of the end use.

SLR understands that piled foundations were installed on site using the driven steel precast piling (vibratory piling) method and reinforced concrete bases in Q2 2016. The piling locations and activity was undertaken within the footprint of the approved building footprint (as defined by the 2015 Permission). As noted above, the use of driven piles would minimise the generation of potentially contaminative soil arisings and therefore the impact of soil contaminant arisings from construction was minimised.

2.3 Remediation Strategy (April 2016)

SLR has undertaken a detailed evaluation and mapping of the submitted report to the WLGA procedures and this is presented in Table A3 in Appendix 01 to this note. Based on this review and further evaluation of the evidence base, SLR would comment that the Remediation Strategy focusses solely on the remediation of asbestos impacted soils as identified in the Site Investigation Report. It could have been strengthened by summarising and discounting the other pollutant linkages previously introduced by CC Geotechnical as part of its summary of previous reports.

The scope and scale of the remediation works are limited and this is commensurate with the conceptual model and the lower sensitivity of the end use of the site. There would not appear to be any potential pollutant linkages that would require inclusion in the remedial strategy in the context of the proposed and as-built development.

2.4 Verification Report (August 2016)

SLR has undertaken a detailed evaluation and mapping of the submitted report to the WLGA procedures and this is presented in Table A4 in the Appendix 01 to this note. Based on this review and further evaluation of the evidence base, SLR would comment that the verification report follows the scope of work proposed by the Remediation Strategy and focusses on the remediation of asbestos impact soils. WSP indicate that the driver for remediation was a need to reduce site levels for construction. The report records that 28 loads² of asbestos impacted soils were removed to landfill and were classified as non-hazardous waste due to asbestos concentrations being below 0.1%. WSP closely monitored the excavation activity, including air monitoring, to ensure that the remedial activity did not release asbestos fibres. No elevated fibre concentrations were detected.

Validation samples were collected on completion of remedial excavations.

No other excavation or soil removal activities are described in the Verification Report.

2.5 Site Condition Report (October 2016)

The report was prepared in support of a Bespoke Environmental Permit for the proposed facility and was to represent the Application Site Condition Report (ASCR). SLR has undertaken a detailed review of the submitted report. Based on this review and further evaluation of the evidence base SLR would comment as follows:

- Sol specifically state that no historical investigations were available for the application and no baseline site condition could be provided. Strictly speaking this is not true as previous reports had been prepared, but for whatever reason were not provided to Sol in the preparation of their ASCR.
- It summarises the Condition of Land at Permit issue based upon the sites environmental, setting and land use history relying substantially upon a Groundsure report.
- A visual reconnaissance of the site was undertaken and at the time of inspection construction had commenced. The area of asbestos contamination described by WSP is also identified.

² Based on an average 8 wheel tipper truck; this is of the order of 280m³ of soil materials or around 500 tonnes by weight. This seems a small to standard volume for a site of this size and developed use.

- It describes the properties of the chemicals and hazardous substances stored on-site as part of the permitted activities and explains, primarily due to robust use of storage containment and impermeable hardstanding, that the potential for the proposed activity to impact on soil and groundwater is considered to be low.

As this report is effectively a further preliminary assessment without the benefit of insight and investigation results from previous reports, SLR has not undertaken a detailed evaluation and mapping of the submitted report to the WLGA procedures. In particular, it provides no new information in respect of pre-existing ground conditions. Nevertheless, it does provide information on the proposed construction of planned chemicals and hazardous materials containment and hardstanding and management of drainage systems in order to mitigate the potential for impact to soil and groundwater.

3.0 Site Sensitivity

Overall, the site is considered to be located in a low sensitivity environmental setting based on the following:

- When operational, the site will be occupied and operated by suitably trained personnel with site access control; health and safety procedures and suitable PPE. On this basis, occupiers of the Facility are not considered to be sensitive to any residual contamination present beneath the existing hardstanding.
- Groundwater beneath the site is present in the made ground and is likely to be in hydraulic continuity with the saline or brackish surface water in the docks. This water table is effectively perched above any groundwater in deeper natural geological deposits beneath the site and is unlikely to percolate downwards. Similarly the Facility is flat and surfaced with hardstanding so there would appear to be no recharge or driving head to create substantial flow or discharge into the surface waters in the docks.

4.0 Summary of Residual Risks

The operational use of the site will include site workers and HGV drivers and other contractors visiting the site on a daily basis. The Facility buildings and structures on site will effectively limit the exposure of any site workers or visitors to any contaminant impacts in soil or groundwater. Similarly, off-site human health exposures (off-site workers) will be limited by the presence of buildings and hardstanding in the surrounding commercial premises within the Docks. It is considered that people living in residential properties outside of the Docks or within other parts of the Barry Waterfront residential developments (under construction to the west) will not be impacted by any residual contaminant impact beneath or on the Facility, and therefore it poses no residual risk.

The reports do not extend to cover the vehicle turning area at the northern part of the Facility (Area 12 on Drawing BARRY-01-DWG-01-20000), but there are no particular grounds to consider that this part of the Facility is in a substantially different condition to the majority of the assessed site. Therefore it is reasonable to infer that any contaminant if present is unlikely to present a risk of adverse impact to the suitability of the site for its planned use.

5.0 Conclusions

On the basis of the evidence in previous reports, it is reasonable to conclude that ground conditions at the site have been suitably assessed. In its current built condition, any fugitive residual contaminant impacts in soil or groundwater beneath hardstanding are effectively sealed off from direct contact with people working on the site and the pathway and driving head gradient for percolation or migration off-site is limited. Therefore, whilst it is not possible to confirm that no residual impact exists, it is nevertheless reasonable to assume that any contaminant is unlikely to present a risk of adverse impact during operation of the Facility.

Therefore, the construction of the Facility will have had no significant Ground Condition impacts and therefore it is appropriate to scope Ground Conditions out of the ES.

DRAWINGS



NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT PROJECT STANDARDS AND SPECIFICATIONS.

LEGEND

- 01 RECEPTION BUILDING / FUEL STORAGE AND FEED BUILDING
- 02 MAIN PROCESS BUILDING
- 03 TURBINE AND WELFARE BUILDING
- 04 ACC STRUCTURE
- 05 FGT SLAB, VARIOUS EXTERNAL EQUIPMENT (INC CHIMNEY STACK) AND FLUE GAS CLEANING EQUIPMENT
- 06 ASH SILOS
- 07 FIRE WATER TANK AND PUMPHOUSE
- 08 EMERGENCY DIESEL GENERATOR AND DIESEL STORAGE TANK
- 09 WEIGHBRIDGE
- 10 AUXILIARY COOLERS
- 11 EXPORT TRANSFORMERS
- 12 VEHICLE TURNING AREA



Revision	By	CHK'd By	Date	Comments
0	CR	IW	04/22	

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Site: BARRY BIOMASS FACILITY

Project:

Drawing Title: **SITE LOCATION PLAN**

Scale: 1:400 @ A1 Date: APRIL 2022



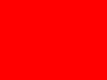
Drawing Number: **BARRY-01-DWG-01-20000** Revision: **0**

APPENDIX 01

SLR Review of previous reports against WLGA Checklists

Assessment of Submitted Documents Against WLGA Guidance

Colour coding used to indicate compliance with guidance:

	No substantial divergence from guidance
	Moderate divergence from guidance – data gap present but unlikely to have a significant impact on the assessment or require significant further work
	Substantial divergence from guidance data gap present with potential to have significant impact on the assessment and/or require significant further work

Abbreviations used in Tables A1 to A4.

CGG:	CG Geotechnical Limited
CSM:	Conceptual Site Model
MCERTS:	The Environment Agency Monitoring Certification Scheme.

Table A-1: Barry Biomass: Phase 1: Preliminary Risk Assessment / Desk Study

WLGA Guidance (2017)	Phase I - II Geoenvironmental Report For Land Off Woodham Road, Barry, CG63 4JE. Prepared by CG Geotechnical Limited . Nov 2015.
Purpose and aims of the study	The purpose and aims of the study are clearly stated in Section 2.0: "to assess whether the site is likely to be affected by contamination, to an extent that it may pose a risk to human health and/or the built environment and/or the wider natural environment, or is affected by any other natural or man-made feature which may impact on the proposed development"
Credentials of person undertaking the study	Main author and reviewer signed the report with identical qualifications: CEng MICE CEnv. These would appear to be suitable qualifications for land contamination assessment.
Site location and current layout plans	Site Location Plan and aerial photograph included in report. The Aerial photograph indicated that the site was not in use and had no discernible structure or layout. Note that the study is for the original 2015 "red-line" area only.
Description of site and surrounding land uses	The site was subject to a walkover in September 2015. The report includes a summary but not detailed description of surrounding land use. There is a good selection of photographs of the site from the walkover included as Appendix E; but only limited photographs of surrounding land uses.
Appraisal of site walkover survey	There is a detailed table of observations from the walkover particularly surface cover description, manholes, plant cover; but there is a lack of evaluation and appraisal. Site photographs indicate substantial quantities of fly tipped materials (domestic furniture is visible), but there is limited description or appraisal of the fly tipped material and the potential for it to act as an additional contaminant source.
Review of site history	Presented in Section 4.0 of the report. Reasonably well structured factual table, with all historical OS maps included in an appendix. As the site is historical dockland and that ports were important targets during WWII, the report does include a detailed site specific UXO assessment (Appendix D). This concludes that there are no records of munitions falling within the study site or the immediate area. There is a lack of evaluation or appraisal of the historical land uses as sources of contamination in relation to the conceptual site model.
Details of current and proposed site use	Current use is as detailed in site walkover. The proposed use is stated as a biomass plant.
Assessment of the environmental setting including the interpretation and implications of: <ul style="list-style-type: none"> the geology, hydrogeology and hydrology of the area information from the Environment Agency on abstractions, pollution incidents, water quality classification, landfill sites within 250 metres and flood risk whether there are any archaeological or ecological considerations 	This is detailed in factual tables in Section 5.0 and 6.0. Sources were stated to include Environment Agency Maps and a GroundSure EnviroInsight Report presented in Appendix D. The absence of Archaeological interest is stated in Section 7.0. The sources of factual data presented are considered to be robust and representative. However, there is no substantial assessment, interpretation or implications drawn from these sources that are presented in a conceptual site model.
Review of any previous site contamination studies (desk based, intrusive, or IPPC investigations where relevant) and remediation works	It is stated that studies and consultations have not established evidence of previous site investigations.
Review of local authority planning records, building control records, drainage and service plans	Not undertaken as part of Phase 1
Identification of potential contaminants of concern and source areas	Described in Section 10
Preliminary (qualitative) assessment of risks, to include: <ul style="list-style-type: none"> outline conceptual model to show the nature and extent of the potential contamination; and, an appraisal of the potentially relevant pollutant linkages (contaminants, pathways and receptors). 	Described in Section 10.
Identification of information gaps and uncertainties, recommendations for intrusive contamination investigations (if necessary) to include the identification and justification of target areas for more detailed investigation.	Described in Section 11. This is a relatively short description of information gaps and uncertainties. It could be inferred that no specific target areas had been identified and that the investigation was designed to provide sufficient information to assess risks to human health and the environment without defining what would constitute sufficient data.

Table A-2: Barry Biomass: Phase II: Quantitative Risk Assessment / Site Investigation

WLGA Guidance (2017)	Phase I - II Geoenvironmental Report For Land Off Woodham Road, Barry, CG63 4JE. Prepared by CG Geotechnical Limited . Nov 2015.
Purpose and aims of the study.	Described in Section 11. This is a relatively short description of information gaps and uncertainties. It could be inferred that no specific target areas had been identified and that the investigation was designed to provide sufficient information to assess risks to human health and the environment without defining what would constitute sufficient data.
Credentials of person undertaking the study.	As per Phase 1 – combined P I and P II report
Site location and current layout plans.	As per Phase 1 – combined P I and P II report
Review and summary of any previous reports with references.	As per Phase 1 – combined P I and P II report
Results of preliminary risk assessment and summary of outline conceptual model	As per Phase 1 – combined P I and P II report
Liaison with the Local Authority PC/EH.	No evidence of this having taken place in terms of consultation with regulator on investigation scope. This was not uncommon practice where consultation responses could be slow and a combined Phase 1 & II study was required.
Details of current and proposed site use.	As per Phase 1 – combined P I and P II report
Site investigation methodology to include: <ul style="list-style-type: none"> any preparatory enabling works an appropriately scaled and annotated plan 	A site specific methodology is not presented. A generic methodology describing the sampling and methodologies typically employed by CCG is included as Appendix F. This is a relatively comprehensive document, but does not refer specifically to the regulatory or guidance regime for contamination land in Wales.
Justification of sampling strategies, including: <ul style="list-style-type: none"> the location, depth and number of samples taken method of forming exploratory holes details of surface/groundwater monitoring programmes methods of collecting, storing and transporting samples to laboratory description of site works and observations. 	Section 12 provides a factual description of the programme of fieldwork undertaken including the methods of forming the exploratory holes and the details of monitoring wells installed. There is an absence of discussion of investigation locations relative to receptors in the future built development. Nor is there particular discussion of investigation locations relative to contaminant sources from previous or recent site uses. There is a description in Section 12.4 regarding use of field screening for volatiles to select soil samples for analysis, but no reference to anticipated depth of accumulated contaminants, targeting of made ground or similar. Trial pit photographs were provided in Appendix I.
Justification of analytical strategies.	No justification was provided although a comprehensive list of contaminants were selected in the analytical suite. 13 samples were analysed equivalent to 1 per borehole or trial pit. All were collected from less than 1m below ground level. CCG are not clear on the criteria used to select depths for sample collection; nor for analysis. No samples are collected at or just above the groundwater table where insoluble organic contaminants, such as hydrocarbons, might accumulate.
Analysis of samples to be carried out by an MCERTS accredited laboratory.	The samples were all analysed by ELAB laboratory. The reports indicate that the lab had MCERTS accreditation for a proportion of the determinants analysed. MCERTS was not held for certain organic contaminant suites. This is not uncommon.
Results and findings of investigation to include: <ul style="list-style-type: none"> Description of ground conditions (made ground / soil and perched / groundwater regimes, including interactions between them) Flood risk Discussion of nature and extent of contamination Meaningful comparison of the analytical results to appropriate standards, with full justification of the standards chosen To include consideration of ground gas and the presence of asbestos. 	Ground conditions and groundwater strikes generally described in Section 13.0. The nature and extent of soil contamination was described in relation to results of laboratory analyses. Maximum recorded concentrations were screened against Tier 2 generic quantitative risk assessment criteria. No table of groundwater elevations or interpretation of groundwater flow direction was provided. Summary ground gas monitoring data were provided. But there was limited discussion of results. A GSV was calculated and characteristic Situation 1 assigned to ground gas risk at the site. Asbestos was detected in one of 8 samples analysed. This detection drove recommendations for further action.
Evaluation of site investigation results against conceptual model.	Lack of a robust review of potential linkages. A revised Conceptual site Model (CSM) was presented in relation to the identified linkage to asbestos in soil but other potential linkages were not formally closed out.
Site specific risk assessments for both health and environmental receptors.	Limited to comparison of maxima recorded in sampling to generic assessment criteria. There was no description or discussion of sample depth in relation to contaminant source or future receptor.
An interpretation and discussion of the findings of the investigation and risk assessment with identification of pollutant linkages that present unacceptable risk and discussion of uncertainties.	Section 21 discussed risks to human health during the construction phase, but there was limited discussion on built phase until Section 24. This tended to focus on risks to be managed during development rather than closing out other linkages in the built development.

Table A-3: Barry Biomass: Remediation Strategy Review

WLGA Guidance (2017)	Barry Biomass Remediation Strategy. Prepared by WSP Parsons Brinckerhoff. Reported dated April 2016
Purpose and aims of the report.	WSP state that they had been instructed to prepare a Remediation Strategy in support of the proposed construction of a Biomass Plant
Credentials of person undertaking the study.	Reports are signed but no accreditation of the author or reviewer is provided.
Site location and current layout plans.	Site location plan provided. Current layout plans not provided – additional information is based upon proposed future layout.
Review and summary of any previous reports with references.	There is a review of the CCG Phase I and Phase II report. Principally re-stating its findings without a critical review of how robust it was.
Liaison with the Local Authority PC/EH.	Not indicated to have been undertaken.
Description of ground conditions including geology, hydrology and hydrogeology.	The report included information on the ground conditions for the delineation investigation included in the Section 2.3 of this report. In Section 3.3 an additional contamination source is identified. This comprises the presence of 3 stockpiles of excavated materials containing wood, metal and plastic. This may comprise fly tipped materials described in the CCG report that have been scraped from the surface of the site.
Remediation objectives; criteria for relevant pollutant linkages and overall site criteria.	This was not considered or appraised in the Remediation Strategy. The Strategy appears to be focussed solely on the asbestos impact
Remediation methodology.	The report describes off-site waste treatment process. The remediation is driven by the need for a reduced level dig across the site to enable construction rather than the suitability of soil materials to remain. Save that the asbestos would be potentially harmful if left at surface during the construction phase.
Site zoning and phasing with approximate timescales.	Not outlined. Probably not required for the scope of remedial work proposed.
Preparation works and operational constraints.	Not discussed in detail.
Specific site management procedures and emergency contingency plans.	Included as Section 3.4
Location and construction details of monitoring activities e.g. dust gauges, vapour monitoring, groundwater boreholes.	Not detailed in terms of location, although asbestos fibre monitoring was planned to be undertaken. Groundwater monitoring was not proposed on basis that no contaminant impact to groundwater was previously identified.
Evaluation of site investigation results against conceptual model.	Not discussed.
Details of permits and licences in place and how compliance will be demonstrated.	Compliance is not described or discussed. However, the excavated materials were to be hauled off-site for disposal or treatment. The Remediation Strategy notes that Environmental Permits will be provided for waste receipt facilities and this is included in the appendices.
Detailed site plans/drawings (appropriately scaled and annotated) showing areas requiring remediation, locations and phasing of works, stockpiling, monitoring and sampling points.	A plan identifying the area of asbestos impacted soils is included but details of stockpiling, monitoring and sampling points are not included.
Details of what constitutes completion of remedial works and how completion will be verified.	This is not detailed in the Strategy. Presumably because it was envisaged to be a relatively simple process.
Verification Plan	This is not detailed in the Strategy. Presumably because it was envisaged to be a relatively simple process.
Monitoring and Maintenance Plan	This is not detailed in the Strategy. Presumably because it was envisaged to be a relatively simple strategy and as it constituted removal of particles of solid contaminant, future monitoring or maintenance would not be required.

Table A-4: Barry Biomass: Verification Report Review

WLGA Guidance (2017)	Barry Biomass Verification Report. Prepared by WSP dated August 2016.
Purpose and aims of the report.	WSP state that they had been instructed to prepare a Remediation Verification Report in support of the proposed construction of a Biomass Plant
Credentials of person undertaking the study.	Reports are signed but no accreditation provided.
Site location and current layout plans.	Site location plan provided. Plans show waste stockpiles and topographic information. There are no structures present on the site at the time of the remediation work. Later in the validation report the validation plan is shown relative to proposed biomass plant structures.
Review and summary of any previous reports with references.	Previous reports are referenced but no review to put these in context with the remediation work is presented.
Liaison with the Local Authority PC/EH.	Not indicated to have been undertaken.
Information as detailed in the remediation strategy including description of relevant pollutant linkages assessed, i.e.;	The objective of the remediation strategy is not clearly stated. It is indicated that the main purpose was to identify and remove excess soils that may be asbestos contaminated in accordance with waste management regulation and in manner protected site construction workers and the wider environment. The report does not explicitly state that it is to protect future users of the site. Presumably because the author and client consider this is solely a matter of removing solid particles of contaminant (asbestos) in the made ground and other receptors and sources are not of concern.
<ul style="list-style-type: none"> • Description of ground conditions including geology, hydrology and hydrogeology. • Remediation objectives; criteria for relevant pollutant linkages and overall site criteria. • Remediation methodology. 	
Details of remedial work undertaken and by whom.	Detailed in Section 2.2 & 2.3 and Appendix A: (Asbestos Abatement Report. Barry Biomass, Woodham Road, Barry Docks, Barry Island, CF63 4JE.) Dated 22 nd August 2016. By WSP PB for Galliford Try Waste2Energy.
Results of verification, validation, performance testing and monitoring as specified in the Verification Plan.	The report refers to collection of soil verification samples from remedial excavation and analysis for asbestos with results included as Appendix D. However in the version of the report provided to SLR there are no asbestos analyses in Appendix D (this may have been a report compilation/formatting error). Detailed results of air quality monitoring for asbestos during the excavation of identified asbestos impacted soils are included in Appendix A.
Description of reinstatement works.	None are described. It is implied but not stated that the soils were removed as part of a reduced level excavation to construct the development platform. In this scenario no reinstatement would be expected.
Description of final site conditions at completion.	This detail is not described in the WSP report.
Confirmation that remediation objectives have been met and confirmation of post-completion monitoring/ maintenance requirements.	This detail is not described in the WSP report.
Details of what constitutes completion of remedial works and how completion will be verified.	This detail is not described in the WSP report. It is stated in Section 3.0 of the report that “work to remove soils that contain asbestos fibres has been “overviewed” by WSP Remediation. Management of these works complied with the Remediation Method Statement. Monitoring indicated that no elevated fibre counts were reported and that in the opinion of WSP planning conditions 8d and 8e can be discharged.
Verification Plan	Plan showing areas remediated and verification sample locations included.
Monitoring and Maintenance Plan	This is not included in the WSP report. It is inferred that this is omitted because the report authors were of the reasonable opinion that removal of particles of contaminant would not leave residual impact that required such a plan.

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