

Flood Risk Assessment

Tees Valley Energy Recovery Facility
Grangetown Prairie, Dorman Point
Prepared on behalf of Viridor Tees Valley Limited
March 2023

Intended for

Viridor Tees Valley Limited

Document type

Report

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TEES VALLEY ENERGY RECOVERY FACILITY, GRANGETOWN PRAIRIE, DORMAN POINT FLOOD RISK ASSESSMENT

TEES VALLEY ENERGY RECOVERY FACILITY FLOOD RISK ASSESSMENT

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CONTENTS

EXECUTIVE SUMMARY	i
1. INTRODUCTION	1
1.1 Appointment and Brief	1
1.2 Scope and Objectives	1
1.3 General Limitations and Reliance	1
2. Site Description	3
2.1 Application Site Description	3
2.2 Proposed Development	3
3. REVIEW OF BASELINE DATA	4
3.1 Site Topography	4
3.2 Surface Water Features	4
3.3 Underlying Geology and Groundwater Levels	4
3.4 Flood Zone Classification	5
3.5 Flood Defences	6
3.6 Surface Water (Pluvial) Flood Risk	6
3.7 Reservoir and Artificial Flood Risk	7
3.8 Historic Flooding	7
3.9 Groundwater Flood Risk	7
3.10 Existing Drainage	7
3.11 Existing Flood Risk Summary	7
4. ASSESSMENT OF FLOOD RISK	9
4.1 Tidal and Fluvial	9
4.2 Groundwater	9
4.3 Reservoirs, Canal and Other Artificial Sources	9
4.4 Sequential Test	9
4.5 Surface Water Runoff	9
CONCLUSIONS	11

APPENDICES

Figure 1

Reserved Matters Application Boundary

Figure 2

LIDAR Data

Figure 3

EA Flood Map

Figure 4

EA Surface Water Map

Appendix 1

Proposed Development Plan

EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) has been prepared to accompany the reserved matters application for a proposed development comprising the construction of an Energy Recovery Facility near Tees Valley, Redcar & Cleveland. The FRA was carried out in accordance with the NPPF.

It has been determined the flood risk from all sources, with the exception of groundwater, is low and should remain low during the design, construction and operational life of the detailed scheme which forms the basis of this reserved matters application. Flood risk to downstream receptors should not increase provided surface water discharge is managed according to the proposed drainage strategy. Proposed mitigation comprises the inclusion of an attenuation pond and lined below-ground attenuation tank to retain surface water runoff. It is proposed to discharge surface water at an attenuated rate to Holme Beck.

Groundwater flood risk is low-moderate but variable though the site due to changes in topography and ground conditions. Groundwater flood risk should not increase significantly as a result of the detailed design.

Because the site is situated in Flood Zone 1, the Sequential Test and Exception Test are not required under the NPPF. The detailed design of the ERF is considered to be acceptable in flood risk terms in accordance with the requirements of the NPPF.

1. INTRODUCTION

1.1 Appointment and Brief

Ramboll UK Limited (Ramboll) has been commissioned by Viridor Tees Valley Limited ('the client') to undertake a Flood Risk Assessment (FRA) to support a reserved matters application for an Energy Recovery Facility (ERF) in the Tees Valley, Middlesbrough.

Tees Valley Authorities together with Durham County Council and Newcastle City Council, have joined together to create an opportunity for a contractor to design, build, finance and operate a new ERF in the Tees Valley on a mandated site owned by the South Tees Development Corporation (STDC). Redcar & Cleveland Borough Council (RCBC), as the local planning authority, granted outline planning permission for the construction of an ERF and associated development at the site under reference R/2019/0767/OOM on 24 July 2020.

Viridor is applying for reserved matters approval for the details of an ERF pursuant to this outline permission.

1.2 Scope and Objectives

This report considers the risks of various sources of flooding to the site and the consequent risk of flooding to downstream receptors (such as people, property, habitats, infrastructure and statutory sites) from the proposed development as a result of surface water runoff. A comparison is made between the current situation and the proposed development.

This FRA has been carried out in accordance with the National Planning Policy Framework (NPPF)¹. It is to be used to assist the Local Planning Authority (LPA) and relevant statutory consultees when considering the flooding issues of the proposed development, as part of a reserved matters application.

This report provides the following information:

- i. A review of the flood risk to the site based upon flood data and the flood maps provided by the Environment Agency (EA) and the relevant Strategic Flood Risk Assessment (SFRA);
- ii. An assessment of flood risk from all sources including tidal, fluvial, pluvial, groundwater and infrastructure failure to the proposed development;
- iii. An assessment of the compatibility of the proposed development for its location based on flood risk and its proposed usage;
- iv. An assessment of the impact of the proposed development in terms of surface water runoff;
- v. Proposals for measures to mitigate the generation of surface water runoff as a result of the proposed development; and,
- vi. Proposals to mitigate any residual flood risks to the proposed development.

1.3 General Limitations and Reliance

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions reached in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

¹ GOV.UK, National Planning Policy Framework (published June 2019) <https://www.gov.uk/government/publications/national-planning-policy-framework--2> (accessed 01/2023)

The key sources of information used to prepare this report are provided as footnotes within the document. Ramboll cannot accept liability for the accuracy or otherwise of any information derived from third party sources.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

Unless otherwise stated in this report, the scope of services, assessment and conclusions made assume that the site will continue to be used for its current purpose and end-use without significant changes either on-site or off-site. Unless stated otherwise, the geological information provided is for general environmental interpretation and should not be used for geotechnical and/or design purposes.

2. SITE DESCRIPTION

2.1 Application Site Description

The site is currently brownfield and lies within the south west corner of the STDC regeneration area within the Grangetown Prairie Zone, and is situated between John Boyle Road to the west, Tees Dock Road to the east, the A66 to the south, and the railway line to the north. Further to this, Dorman Point Way is a newly constructed road that lies to the south of the proposed ERF site.

The extent of the ERF outline permission (R/2019/0767/OOM) covers around 10 ha of land that is roughly rectangular in shape. The site subject to the reserved matters application sits within the area of the outline permission and covers an area of 8.87 ha, at 10m above Ordnance Datum.

The site is immediately bounded by brownfield on all sides. As mentioned above, an access road is located along the south of the site, known as Dorman Point Way. Once completed, this access road is proposed to connect to a network of access roads in the surrounding industrial landscape and to Stapylton Street approximately 300 m south. There are railway lines to the immediate north and light industrial/commercial spaces further west. The wider surrounding area is characterised primarily by heavy industry (steelworks) with additional light industrial/commercial industry present further south.

The ERF site is a previously developed industrial site that was formerly used for the production of iron and steel (occupied by Eston Iron Works and Cleveland Steel Works). Following the closure of the steel works and cessation of industrial activities, the building complex was cleared in the 1980's and the site is now vacant. Remediation works have recently been carried out on the site, these include:

- Vegetation clearance;
- Topsoil strip;
- Site wide bulk excavation;
- Waste segregation;
- Remediation and backfill works;
- Minor disposal of items deemed unfit for re-use on site.

The reserved matters boundary is provided in Figure 1.

2.2 Proposed Development

Tees Valley Authorities, Durham County Council and Newcastle City Council (the Councils) have joined together to create an opportunity for a contractor to design, build, finance and operate a new ERF to be located in the Tees Valley on a mandated site owned by the South Tees Development Corporation (STDC). Redcar & Cleveland Borough Council (RCBC), as the local planning authority, granted outline planning permission for the construction of an ERF and associated development at the site under reference R/2019/0767/OOM on 24 July 2020.

Viridor is applying for reserved matters approval for the details of an ERF pursuant to this outline permission.

The proposed development layout is provided in Appendix 1.

3. REVIEW OF BASELINE DATA

3.1 Site Topography

The Environment Agency (EA) 1m resolution Digital Terrain Model (DTM) LiDAR data, accessed through DEFRA's online spatial data download service² indicates the Tees Valley site averages approximately 8 m to 8.5 metres Above Ordnance Datum (mAOD) with isolated raised areas consisting of scattered concrete structures and spoil heaps as high as approximately 12 mAOD. Although it is noted that large parts of the site have since be flattened, levelled and built up with aggregate since the time of the LiDAR data being available.. Site elevations are generally lower at the north of the site.

The topographic LiDAR data are presented in Figure 2.

3.2 Surface Water Features

The closest watercourse to the site is the Holme Beck situated on the western boundary of the site where it is culverted but is an open watercourse approximately 350 m south of the site. The Knitting Wife Beck is situated approximately 400 m east of the site where it is culverted and is an open watercourse 500 m southeast. Both watercourses flow north into the River Tees which is situated approximately 1.4 km northwest of the site. The River Tees flows in a north-easterly direction converging with the Tees Estuary approximately 5 km north of the site. Several small, unnamed ordinary watercourses and ditches are present between 500 m and 1 km to the north and west of the site.

3.3 Underlying Geology and Groundwater Levels

BGS mapping of the area (1:50,000 scale map series) was accessed via the online BGS Onshore GeoIndex digital mapping database³. The map series indicate the site is underlain by the Mercia Mudstone Group - mudstone. Superficial deposits consist of Glaciolacustrine Deposits, Devensian - clay and silt.

Two ground investigations were conducted at the site in 2020 by Stantec⁴ and Arcadis⁵. A combined summary of the borehole records from these investigations is shown in Table 3.1.

Trial pits and borehole records from a previous Phase II site investigation identified extensive Made Ground of varying depth through the site and surrounding area. A summary of the strata encountered are summarised in Table 3.1.

Table 3.1: Summary of Ground Conditions Encountered by Stantec (2020) and Arcadis (2020)

Strata	Description	Depths of Stratum (mbgl)
Made Ground	(Grass over) topsoil	0.0 to 0.4
	Concrete (potentially reinforced with or without rebar or found as a slab) or brick*. Void noted at 0.8 m-2.0m (DS01) following concrete breaking at 0.8 m	0.1 to 1.8

² DEFRA Data Services Platform, LiDAR Composite DTM 2019 – 1m, available at: <https://environment.data.gov.uk/dataset/76363295-69d5-406b-90bf-d7b9e8bebfd9> (accessed 01/2023)

³ The British Geological Survey (BGS) Onshore GeoIndex. available at: <http://mapapps2.bgs.ac.uk/geoindex/home.html> (accessed 01/2023)

⁴ Stantec (2020). Phase 1 Geoenvironmental and Geotechnical Desktop Study, Tees Valley ERF, Grangetown Prairie, Redcar, TS10 5QW, ref. RT-NN-2725-5QW

⁵ Arcadis (2020). Phase II Environmental Site Assessment, Grangetown Prairie Area, Former Steelworks, Redcar, ref. 10035117-AUK-XX-XX-RP-ZZ-0062-01-Prairie_ESA

Strata	Description	Depths of Stratum (mbgl)
	Reworked sandy/gravelly clay, or clayey / silty sand, gravel or rare cobbles/boulders of brick, macadam, tile, coal, slag, ash, concrete, wood, rebar, mortar, cloth/fabric, plastic, sandstone/mudstone and/or metal fragments. Slag and ash found in varying quantities from 0-100 %. Slag is often vesicular.	0.0 to 5.2
Tidal Flat Deposits (Alluvium)	Soft to firm brown/grey/orange or brown mottled grey clay or sandy clay. Occasional fine to coarse gravel, and pockets of yellow/brown sand noted.	0.8 to 7.3
Glaciolacustrine Deposits	Soft to firm frequently thinly or occasionally indistinctly laminated brown/grey/orange or brown mottled grey clay. Occasional fine sand noted on laminae.	1.8 to 12.0
Glacial Till	Firm to very stiff occasionally friable dark brown/brown/red/brown clay or sandy/gravelly silt or clay with rare sub-angular cobbles or yellow brown clayey sand or fine or coarse frequently loose sand or sand and gravel or dense grey-brown very sandy gravel. Gravel is fine to coarse and sub-angular to sub-rounded. Gravel and cobbles include sandstone, limestone, gypsum and flint, with gravel of coal noted as possible Made Ground.	3.7 to 21.7
Mercia Mudstone Group	Extremely weak to medium strong red brown frequently laminated and glauconitic and occasionally clayey mudstone with frequent distinct weathering and local restructuring. Frequent numerous white gypsum bands and veins noted, with occasional thin interbeds of gypsum and inclusions of gypsum, glauconite and/or calcite noted. Drillers' notes describe frequent marl.	7.8 to 43.0

The site is situated within the Triassic Rocks (undifferentiated) rock unit which is characterised as a low productivity aquifer. Additionally, the Tidal Flat Deposits are designated a Secondary A Aquifer.

Trial pits from the Arcadis Phase II site investigation indicated shallow groundwater within the Made Ground at depths between 0.3 mbgl to 3.5 mbgl. This was believed to be perched groundwater within granular horizons and subsurface structures. Borehole logs from the investigation indicated groundwater in the superficial deposits from 1.1 mbgl to 3.0 mbgl (or 3.7 mAOD to 7.1 mAOD). Groundwater was also found in the bedrock at depths as high as 4 mbgl. Based on the elevation data, it can be inferred that the direction of groundwater flow is towards the north and northeast.

The site is not situated within a groundwater Source Protection Zone (SPZ).

3.4 Flood Zone Classification

The EA floodplain maps identify areas in England and Wales at risk of flooding by allocating them into flood risk zones. The flood risk zones shown on the flood maps are defined in Table 1 (Flood Zones) of the Guidance (NPPG):

Zone 1: Low Probability. According to the NPPG, land in this zone is considered to have less than 1-in-1000 annual probability of river or sea flooding in any year. This is <0.1%.

Zone 2: Medium Probability. According to the NPPG, land in this zone is considered to have between a 1-in-100 and 1-in-1000 annual probability of river flooding in any year (between 1% and 0.1%) or between a 1-in-200 and 1-in-1000 annual probability of sea flooding in any year (0.5% to 0.1%).

Zone 3a: High Probability. According to the NPPG, land in this zone is considered to have a 1-in-100 or greater annual probability of river flooding in any year (>1%) or a 1-in-200 or greater annual probability of flooding from the sea in any year (>0.5%).

Zone 3b: The Functional Floodplain. According to the NPPG, land in this zone is used for water flow or storage in times of flood. This flood zone should be identified by a Strategic Flood Risk Assessment (SFRA). It is considered to have a 1-in-20 or greater chance of river flooding in any year which is >5%. Another probability, however, can also be agreed between the Local Planning Authority (LPA) and the EA.

According to the Flood Map for Planning⁶ the site is entirely within Zone 1 (Figure 3). There are no other Flood Zones within at least 500 m. Fluvial flood risk to the site is therefore considered low (<0.1%).

The EA flood map data are presented in Figure 3.

3.5 Flood Defences

The site is not in an area benefiting from flood defences according to the EA Flood Map for Planning.

3.6 Surface Water (Pluvial) Flood Risk

The Flood and Water Management Act 2010 defines surface water flooding as flooding that takes place when surface runoff generated by rainwater falls on the surface of the ground and has not yet entered a watercourse, drainage system or public sewer.

The EA's Long-Term Flood Risk Map⁷ identifies areas in England and Wales at potential risk of surface water (pluvial) flooding. The surface water flood maps define flood risk as follows:

High Risk. Considered to have a greater than 1-in-30 annual probability of surface water flooding in any year (>3.3%).

Medium Risk. Considered to have between a 1-in-30 and 1-in-100 annual probability of surface water flooding in any year (between 3.3% and 1%).

Low Risk. Considered to have between a 1-in-100 and 1-in-1000 annual probability of surface water flooding in any year (between 1% and 0.1%).

Very Low Risk. Considered to have a less than 1-in-1000 annual probability surface water flooding in any year (<0.1%).

The EA mapping indicates the majority of the outline planning area to be at 'Very Low Risk' of surface water flooding. Several small areas of 'Low' risk of surface water flooding are interspersed through the outline site and surrounding area. Two negligible areas at 'Medium' risk are present in

⁶ Environment Agency Flood Map for Planning, available at: <https://flood-map-for-planning.service.gov.uk/> (accessed 01/2023)

⁷ Environment Agency Long-Term Flood Risk Map, available at: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map> (accessed 01/2023)

the south-west of the site. It is likely these areas are the result of low-lying ground at the time of EA modelling and the absence of a formal drainage system.

The EA risk of flooding from surface water data are presented in Figure 4.

3.7 Reservoir and Artificial Flood Risk

According to the EA's Long-Term Flood Risk Map the site is not identified as being at risk of flooding from reservoirs.

3.8 Historic Flooding

According to DEFRA spatial data⁸ the site is not situated within an area of historic flooding. There is no historic flooding indicated by EA data within at least 1 km of the site, as defined in the outline planning permission. Additionally, there are no historic flooding incidents and no foul or combined sewer flooding events within at least 500 m of the site indicated in the Redcar and Cleveland SFRA.

3.9 Groundwater Flood Risk

Groundwater flooding is caused by the emergence of water originating from sub-surface permeable strata. A groundwater flood event results from a rise in groundwater level sufficient for the water table to intersect the ground surface and inundate low lying land and/or infrastructure below ground. Groundwater floods may emerge from either point or diffuse locations. They tend to be long in duration developing over weeks or months and prevailing for days or weeks.

Detailed Map 35 of the Redcar and Cleveland Strategic Flood Risk Assessment⁹, which uses the EA's Areas Susceptible to Groundwater Flooding (AStGWF) dataset, indicates the proposed development is situated within an area of <25% risk of groundwater emergence. Additionally, the recorded groundwater levels from previous ground investigations would suggest groundwater flooding at the surface is unlikely as the majority of recorded groundwater depths were greater than 1 mbgl, but groundwater height varied across the site suggesting uneven perched groundwater. This may be affected by the composition of Made Ground. Groundwater flood risk at the surface is therefore considered to be low to medium depending on local topography and ground conditions.

3.10 Existing Drainage

The surrounding sewerage service is operated by Northumbrian Water. The site has no existing foul or surface water connections, and it is therefore inferred that all surface runoff currently infiltrates to ground and/or runs off to adjacent roads and sites.

The primary drainage feature adjacent to the site is the Holme Beck culvert. No current connections to this feature have been identified.

3.11 Existing Flood Risk Summary

A summary of the existing risk of flooding from all sources is provided in Table 3.2 below.

⁸ DEFRA Spatial Data Services Platform, Historic Flood Map, available at: <https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/HistoricFloodMap&Mode=spatial> (accessed 01/2023)

⁹ Redcar and Cleveland Strategic Flood Risk Assessment, available at: <https://www.redcar-cleveland.gov.uk/resident/planning-and-building/local-plan/Pages/Redcar-and-Cleveland-Strategic-Flood-Risk-Assessment.aspx> (accessed 09/2021)

Table 3-2: Summary of Baseline Flood Risk

Sources of Flooding	High	Medium	Low	Comments
Tidal / fluvial			x	The site is entirely within Flood Zone 1. There are no other Flood Zones within at least 500 m. The Redcar and Cleveland SFRA indicates that the site is not within an area at risk of tidal flooding.
Surface water and drainage flood risk			x	There is no known history of flooding from reservoirs or sewers. EA surface water flood data indicates a predominantly 'very low' risk of surface water flooding across the site. Small, scattered areas of low risk are present, plus only two negligible areas of medium risk. Therefore, the risk across the site should be considered low.
Groundwater		x		There is discontinuous perched groundwater within the Made Ground at depths within 1 m and shallow groundwater within the superficial deposits at elevations as high as 7.1 mAOD. The perched groundwater in the Made Ground may pose a moderate to high risk of flooding at the surface but this would probably be localised and dependent upon topography and the Made Ground constituents. Groundwater within the superficial deposits is less likely to pose a flooding risk at ground level but would be a risk at or close to the identified elevations (3.7 – 7.1 mAOD). Overall groundwater flooding risk to the site may therefore be considered Medium.
Artificial sources			x	The site is not within an area at risk of flooding from reservoirs.

4. ASSESSMENT OF FLOOD RISK

4.1 Tidal and Fluvial

As summarised in Section 3.4, the site is situated within Flood Zone 1 and has a <0.1% annual probability of flooding from rivers and the sea. This status is unaffected by the proposed development i.e. the development does not increase flood risk, either to itself or neighbouring locations.

4.2 Groundwater

The risk of groundwater flooding at the surface is low-to-medium depending on surface elevations and local ground conditions. Because of the variable ground conditions on site the exact risk of groundwater flooding in specific locations of the proposed development, that were not subjected to exploration and measurement, may be difficult to determine. The storage bunker may displace groundwater resulting in an increase in groundwater levels against the direction of flow. However, the footprint of the bunker is small relative to the site area and the overall baseline risk of groundwater flooding should not be exacerbated by the proposed development. Flood risk to the proposed bunker is higher as it sits below ground and this would need to be mitigated by waterproofing. This would be resolved at the detailed design stage.

4.3 Reservoirs, Canal and Other Artificial Sources

The site is not within an area at risk of flooding from reservoirs or other artificial sources (see Section 3.7) and vulnerability is not expected to increase over the lifetime of the development provided no significant changes in the presence of surrounding artificial sources occur.

4.4 Sequential Test

Development in the context of flood risk is regulated through the planning process via the NPPF. A Sequential Test and potentially an Exception Test are required if the proposed development is within Flood Zone 2 or Flood Zone 3. Waste treatment developments are regarded as 'less vulnerable' by the NPPF. Because the site is situated in Flood Zone 1, the Sequential Test and Exception Test are not required under the NPPF and the proposed development is considered suitable for Flood Zone 1.

Flooding from fluvial, tidal, and artificial sources are considered to present a Low risk to the proposed land use. Additionally, groundwater flood risk at the surface is considered low-medium. Therefore, the proposed development is considered to be acceptable in flood risk terms in accordance with the requirements of the NPPF.

4.5 Surface Water Runoff

The existing site is brownfield with no positive drainage network present. As a result of the proposed development, the impermeable area on the site will increase, thus increasing surface water runoff rates. Furthermore, surface water runoff rates are anticipated to increase in the future as a result of the effects of climate change. Therefore, a drainage strategy needs to be implemented on the site to manage surface water runoff and prevent flooding to the site or downstream receptors.

The drainage hierarchy for the management of runoff should be considered in determining the drainage strategy for any development site. The hierarchy is as follows:

- Store rainwater for later use.
- Use infiltration techniques, such as porous surfaces in non-clay areas.
- Attenuate rainwater in ponds or open water features for gradual release.

- Attenuate rainwater by storing in tanks or sealed water features for gradual release.
- Discharge rainwater direct to a watercourse.
- Discharge rainwater to a surface water sewer/drain.
- Discharge rainwater to the combined sewer.

Due to existing site contamination, infiltration techniques are not permissible. It has been identified that a hybrid system of an attenuation pond and lined below-ground attenuation tank would be most suitable for a required 2284 m³ to 3312 m³ of storage volume. This specified volume was calculated in order to retain a 1 in 100-year 24-hour storm event (inclusive of a 40% allowance for Climate Change) without causing any surface flooding on the site. The surface water is to be attenuated the above (Q bar) rate of 43.21 l/s and runoff attenuated above Q bar will discharge to the Holme Beck subject to approval.

The surface water drainage strategy proposed for the site is detailed in the separate Report produced by Ramboll dated March 2023, which forms part of the Reserved Matters submission.

CONCLUSIONS

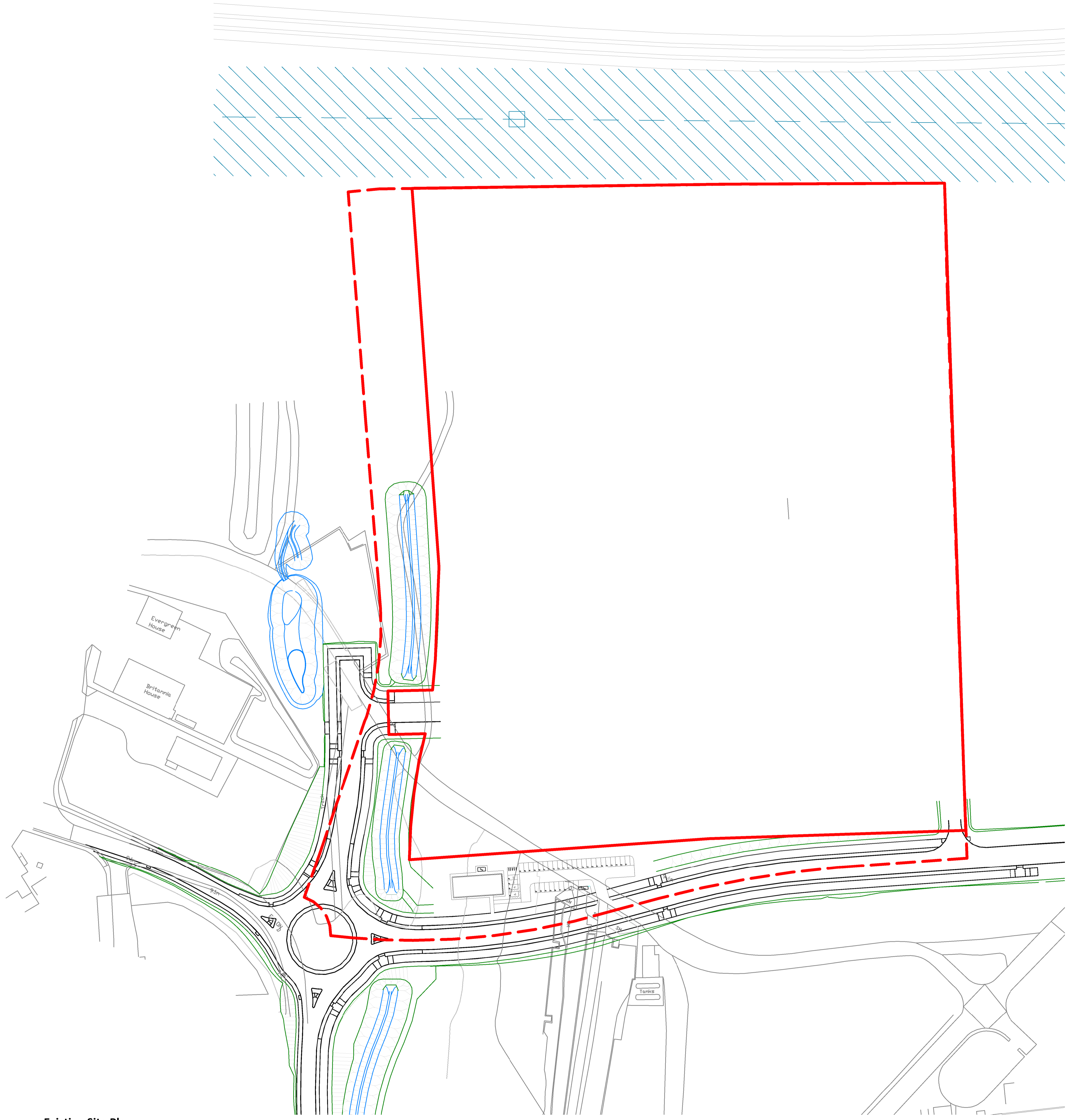
Based on the findings of this Flood Risk Assessment and in consideration of the recommendations made, it is concluded that any flood risk is appropriately managed by the development proposals over the lifetime of the development and fittingly for the vulnerability of proposed users.

The mitigation measures proposed are:

- Implementation of a site-specific surface water drainage strategy.
- Attenuation of surface water flows up to and including the 1 in 100 year storm event including allowances for climate change.
- Discharge of surface water flows from the site to a suitable receiving waterbody at Greenfield runoff rate.
- Inclusion of appropriate waterproofing to the below ground storage bunker.

No further flood risk assessment is deemed necessary.

FIGURE 1
RESERVED MATTERS APPLICATION BOUNDARY



General Notes

Do not scale from this drawing. Only work to written dimensions.

All site dimensions shall be verified by the Contractor on site prior to commencing any works.

This drawing is the property of Fletcher-Rae (UK) Limited (t/a Fletcher-Rae) and copyright is reserved by them. The drawing is not to be copied or disclosed by or to any unauthorised persons without the prior written consent of Fletcher-Rae (UK) Limited.

Map bases were provided to Viridor Tees Valley Limited by the Tees Valley Energy Recovery Facility Contract Authority (comprising Darlington, Hartlepool, Middlesbrough, Redcar & Cleveland, and Stockton Unitary Authorities and Durham County Council and Newcastle City Council) in 2020.

- Reserved Matters Boundary
- - - - Outline Planning Boundary

Site Area: 88,180m² / (21.79 acres)

Highways indicated within this drawing form part of the new Teesworks development

P7	Amendment to drawing title	21.02.2023	JDC	RT
P6	General amendments	14.02.2023	JDC	RT
P5	Amendments to suit client comments	07.02.2023	JDC	RT
P4	Planning / Bid Issue	31.01.2023	JDC	RT
P3	General Updates	10.01.2023	JDC	RT
P2	General note added for copyright purposes	04.04.2022	JDC	RT
P1	Drawing updated to client comments	28.03.2022	JDC	RT
P0	Planning pack update	10.02.2022	JDC	RT
Rev.	Description	Date	ISS	APP

Scale: **1 : 1000 @ A1**
 Status: **S2 Information**
 Drawn By: **JDC**
 Checked By: **RT**
 Date: **04.04.2022**

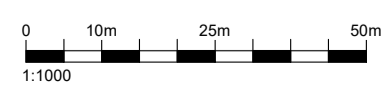
Client: **VIRIDOR**
 Project: **TEES VALLEY ERF**

Sheet Name: **Existing Site Plan**

Project No. Orig. Zone Level Type Role Cls Dwg No. Rev
20044-FRA-00-00-DR-A -90-0025 P7

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Existing Site Plan
 1 : 1000

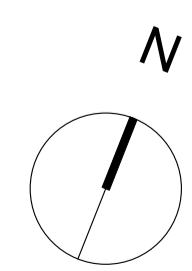



FIGURE 2
LIDAR DATA



Legend

 Outline Planning Boundary

LiDAR DTM 1m (mAOD)

Value

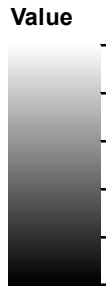
 High : 25
20
15
10
5
Low : 0

Figure Title
Figure 2: LiDAR DTM 1m

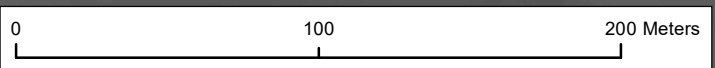
Project Name
Grangetown Prairie Energy Recovery Centre

Project Number 1620010534	Figure No. 2
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Date February 2023	Prepared By DP
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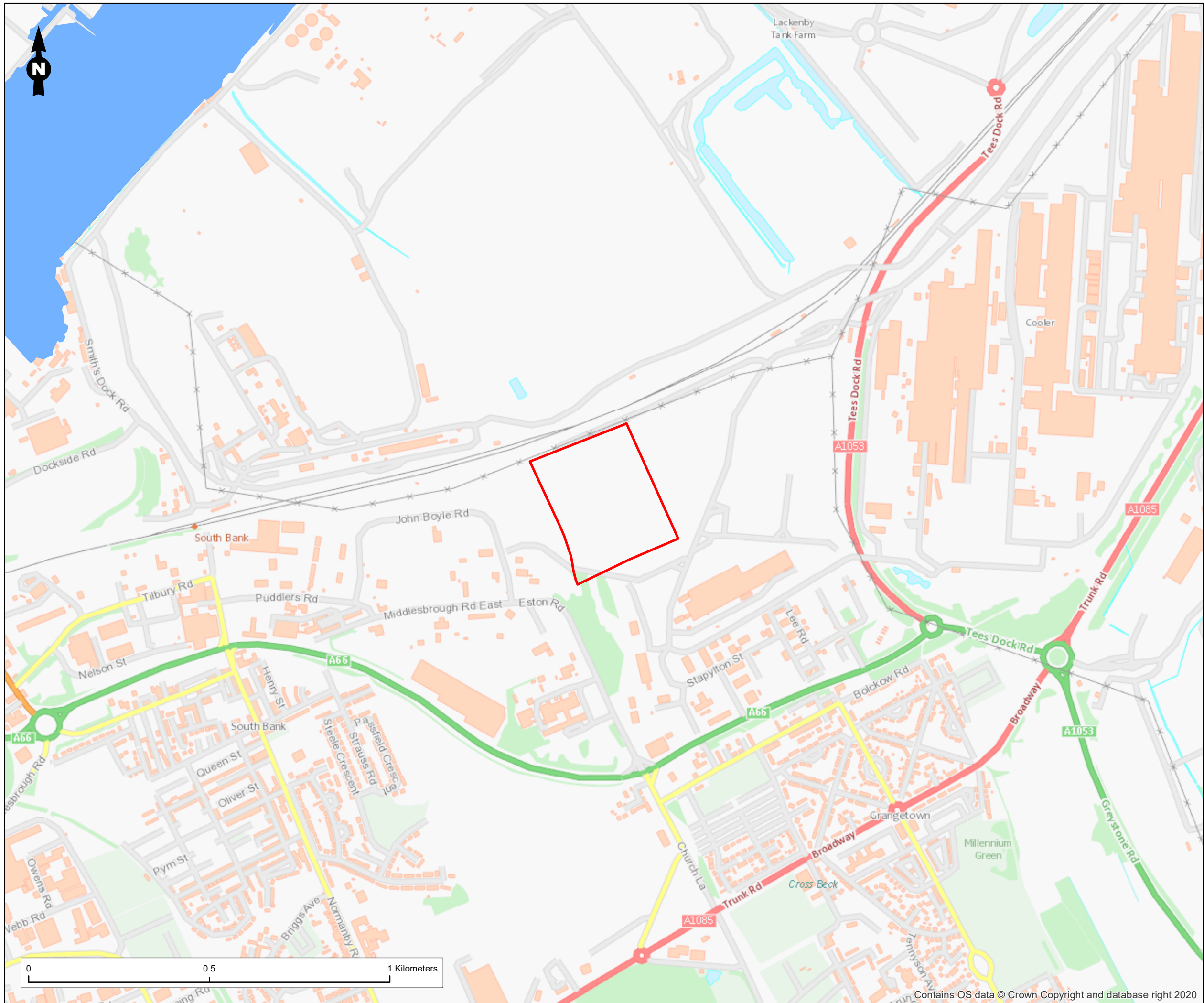
Scale 1:2,500 @A3	Issue 2
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Client
Viridor Waste Management Ltd



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**FIGURE 3
EA FLOOD MAP**



Legend

- Outline Planning Boundary
- Flood Zone 2
- Flood Zone 3

Figure Title
Figure 3: EA Flood Map for Planning

Project Name
Grangetown Prairie Energy Recovery Centre

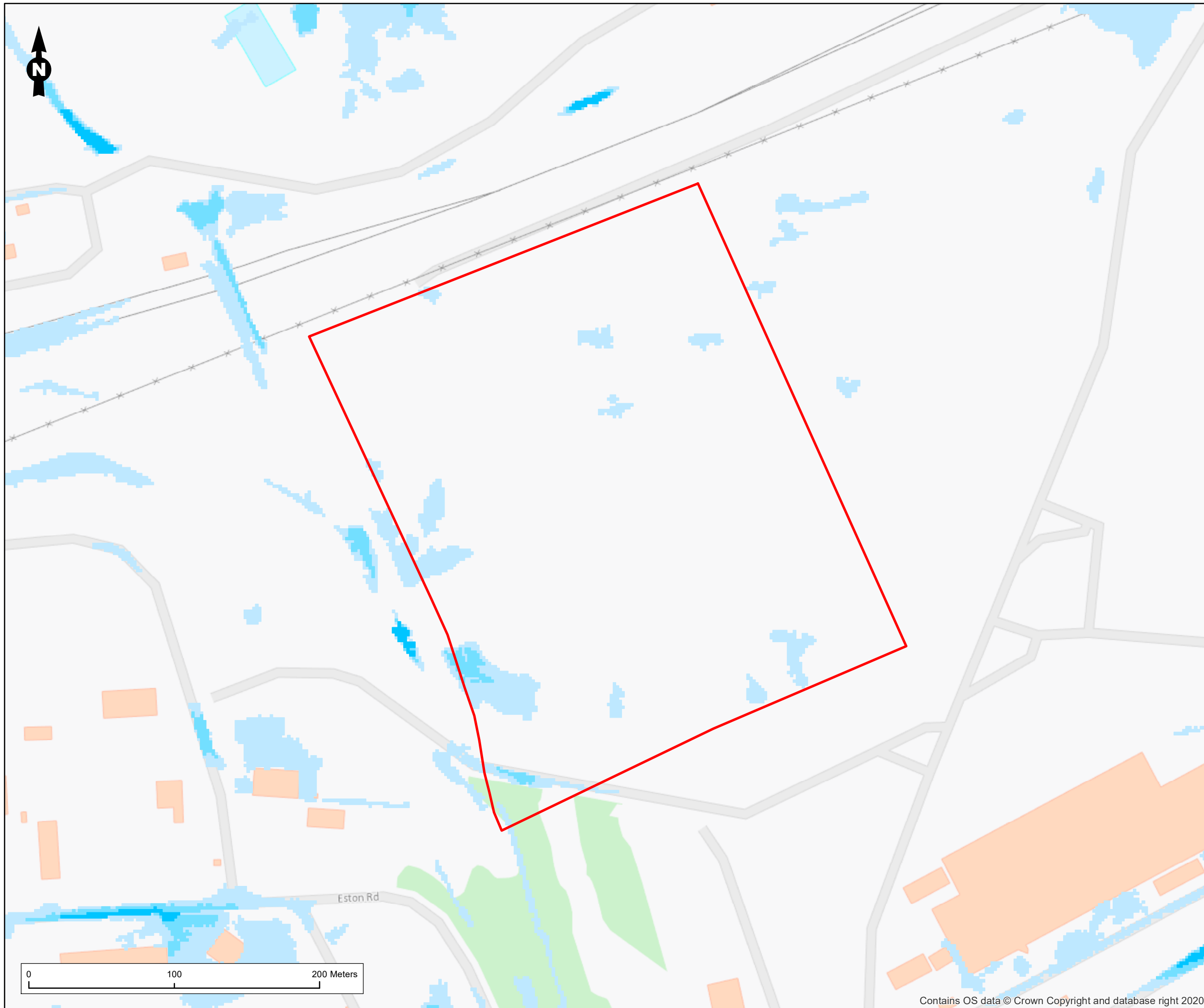
Project Number 1620010534	Figure No. 3
Date February 2023	Prepared By DP
Scale 1:10,000 @A3	Issue 2

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Viridor Waste Management Ltd

RAMBOLL

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 Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

FIGURE 4
EA SURFACE WATER MAP



- Legend**
- Outline Planning Boundary
 - High Risk (>3.3%)
 - Medium Risk (1% - 3.3%)
 - Low Risk (<1%)

Figure Title
Figure 4: EA Risk of Flooding from Surface Water

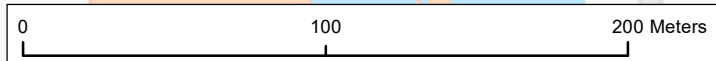
Project Name
Grangetown Prairie Energy Recovery Centre

Project Number 1620010534	Figure No. 4
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Date February 2023	Prepared By DP
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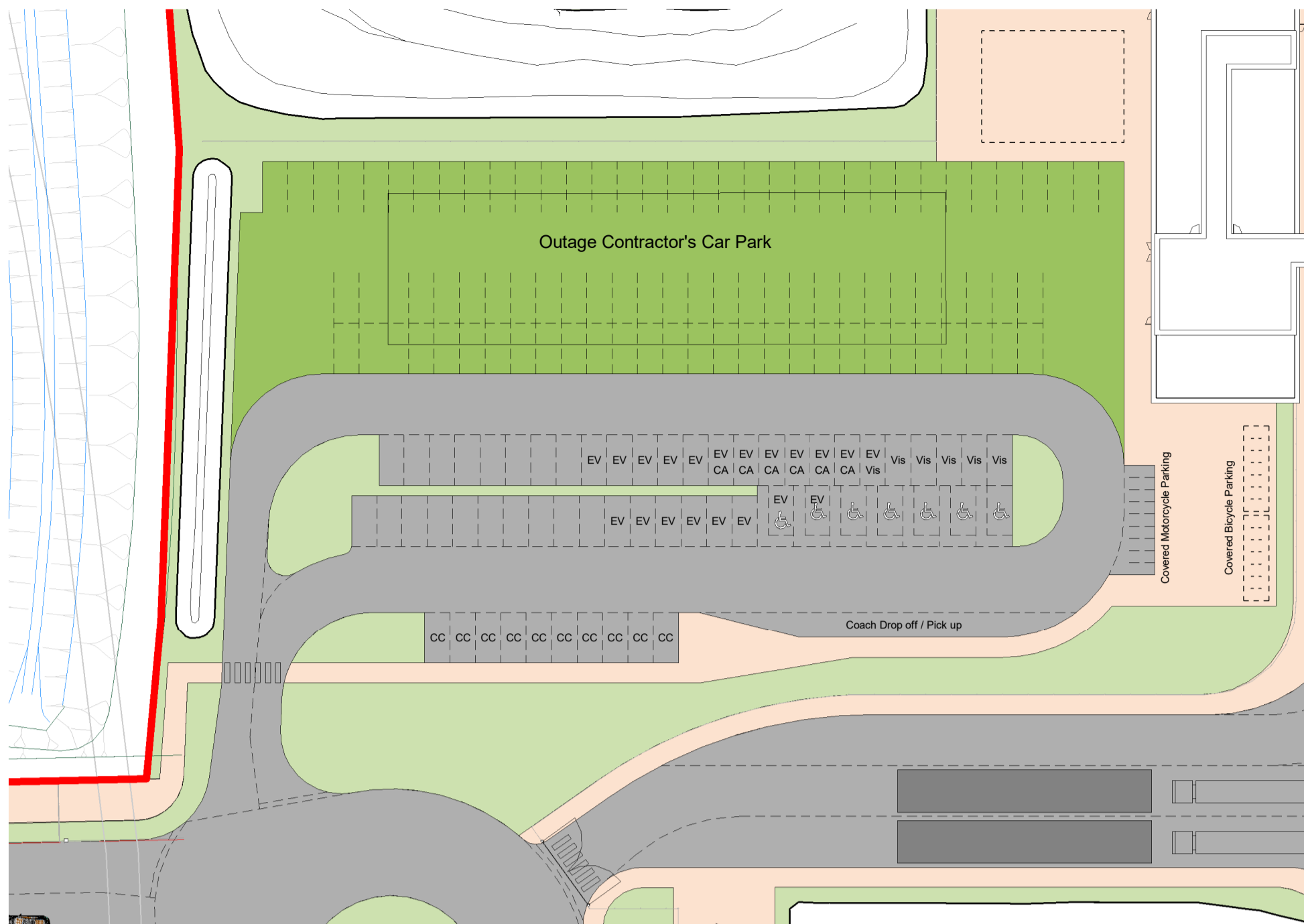
Scale 1:2,500 @A3	Issue 2
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Client
Viridor Waste Management Ltd



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APPENDIX 1 PROPOSED DEVELOPMENT PLAN



Staff & Visitor Car Park
1 : 500

- Common Legend**
1. Electrical & Workshop
 2. Tipping Hall
 3. Fuel Storage Bunker
 4. Boiler House
 5. Flue Gas Treatment (FGT) Hall
 6. Stack
 7. Lime Storage Silos / Dosing *
 8. Fire Water Tank & Pumphouse
 9. Emergency Diesel Generator (EDG)
 10. Vehicle Queuing Bays
 11. Air Pollution Control residues (APCr) Storage & Loadout
 12. Admin Block - Reception, Offices and Visitors
 13. Bottom Ash Storage Hall
 14. Air Cooled Condensers (ACC)
 15. Turbine Hall
 16. CCUS Future Expansion Area A
 17. CCUS Future Expansion Area B (or other future provision)
 18. Contractors compound for shutdown
 19. Combined Heat & Power (CHP) Building
 20. Substation/Transformer
 21. Demin Water Tank
 22. Landscape & Ecology
 23. SuDS/Wetland Area
 24. Security Control & Driver & Crew Welfare Facility
 25. Weighbridge (3 In & 2 Out)
 26. Waste Reception Area For Quarantined Waste and Contaminants
 27. Staff & Visitor Car Parking
 28. Rainwater Pit (roofs)
 29. Generator Step-up Transformers
 30. Diesel & Ammonia Bund
 31. Fin Fan Coolers
 32. Laboratory *
 33. In/Over Bunker Shredder *
 34. Effluent Treatment Pit
 35. Recycled Water Tank *
 36. Chemical Dosing Skid *
 37. Water Treatment Plant
 38. Compressed Air Station *
 39. Weighbridge Offices / Traffic Control
 40. Switchgear Transformer *
 41. Feedwater Pumps *
 42. CEMS
 43. Hot Load Bay
 44. Backload Area / Crane Maintenance *
 45. Raw water pumps and tank *
 46. Oil Tank
 47. Crew Parking Bays
 48. Outside Staff Area
 49. Quarantine Bay *
 50. Emergency Access
- EV Electric Vehicle Charging Parking Space
CA Contract Authority Parking Space
CC Car Club Parking Space
Vis Visitor Car Parking

- Reserved Matters Boundary
- - - Outline Planning Boundary
- Gravel
 - Grass
 - Grasscrete
 - Tarmac
 - Concrete
 - Paved Footpath

Site Area: 88,180m² / (21.79 acres)
CCUS Area: 12,000m² / (2.97 acres)
Landscaping Area: 20,000m² / (4.94 acres)

Note - Items marked * are internal elements, refer to drawing 20-0006 Proposed GA Plan Level 00 for locations

Site Plan
1 : 1000



General Notes

Do not scale from this drawing. Only work to written dimensions.

All site dimensions shall be verified by the Contractor on site prior to commencing any works.

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Map bases were provided to Viridor Tees Valley Limited by the Tees Valley Energy Recovery Facility Contract Authority (comprising Darlington, Hartlepool, Middlesbrough, Redcar & Cleveland, and Stockton Unitary Authorities and Durham County Council and Newcastle City Council) in 2020.

Rev.	Description	Date	ISS	APP
P13	Amendments to suit client comments	24.02.2023	JDC	RT
P12	Additional EV provision indicated	22.02.2023	JDC	RT
P11	General Amendments	21.02.2023	JDC	RT
P10	Amendments to legend	14.02.2023	JDC	RT
P9	Amendments to suit client comments	07.02.2023	JDC	RT
P8	Planning / Bid Issue	31.01.2023	JDC	RT
P7	General Updates	27.01.2023	JDC	RT
P6	General Updates	10.01.2023	JDC	RT
P5	General note added for copyright purposes	04.04.2022	JDC	RT
P4	Drawing updated to client comments	28.03.2022	JDC	RT
P3	Planning pack update	10.02.2022	JDC	RT
P2	Planning pack issue	09.02.2022	JDC	RT
P1	Planning pack updated to reflect Acciona comments	09.12.2021	JDC	RT
P0	Planning pack first issue	16.10.2021	JDC	RT

Scale: As indicated @ A1
Status: S2 Information
Drawn By: JDC
Checked By: RT
Date: 04.04.2022

Client: **VRIDOR**
Project: **TEES VALLEY ERF**
Sheet Name: **Proposed Site Plan**

Project No. Orig. Zone Level Type Role Cls Dwg No. Rev
20044-FRA-00-DR-A-90-0003 P13

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