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ES CHAPTER 2: EXISTING SITE CONDITIONS AND CONSENTED SCHEME

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Indaver Rivenhall Ltd

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ES Volume 2 - Appendices (Doc Ref. 6.2)

Appendix 2.1	Relevant Planning Conditions of the Consented Scheme
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2 Existing Site Conditions and Consented Scheme

2.1 Introduction

- 2.1.1 This chapter provides a brief description of the Site and its surrounding areas, including key features, designations and key sensitive receptor locations that may be affected by the Proposed Development. A full description of the baseline conditions relevant to the technical assessments is provided in each specific topic chapter (i.e., **ES Volume 1, Chapter 7: Climate Change and Greenhouse Gases (Doc Ref. 6.1)** and **ES Volume 1, Chapter 8: Noise and Vibration (Doc Ref. 6.1)**).
- 2.1.2 Details of the Consented Scheme are provided in the second half of this chapter. This is supported by **ES Volume 2, Appendix 2.1: Relevant Planning Conditions of the Consented Scheme (Doc Ref. 6.2)**.

2.2 Site Context

Site Location and Extent

- 2.2.1 The Site is located east of Braintree, approximately 3km south east of Bradwell village, approximately 1km to the north east of Silver End and approximately 3km south west of Coggeshall. The Site covers an area of approximately 5.5ha. The National Grid Reference of the centre of the Site is TL 82336 20457. The Order Limits are shown in red in Figure 1.2.

Site Description

- 2.2.2 The Site is located within the southern part of the IWWMF Site, which is situated on land that was formerly part of Bradwell Quarry¹. The IWWMF Site boundary is shown in blue in Figure 1.2.
- 2.2.3 The Site is approximately rectangular in shape as it covers the extent of the consented IWWMF building footprint, as defined by the Consented Scheme. The Site currently comprises a construction site.
- 2.2.4 The topography at the Site is predominately flat and approximately 15m below ground level. This is lower than surrounding land due to the excavation of overburden and sand and gravel reserves undertaken at the IWWMF Site as part of the former quarrying works. The construction of the Consented Scheme has resulted in further excavation works to the quarrying restoration activities, involving the removal of sand and gravel and excavation into the underlying London Clay to establish the foundation levels for the IWWMF.

¹ Planning reference: ESS/07/98/BTE.

- 2.2.5 Construction works associated with the Consented Scheme are underway on the Site, including excavation, soil nailing, piling works and construction of building cores, as shown in Figure 2.1.

IWMF Site

- 2.2.6 The area of development of the IWMF Site is approximately 1.7km south of Coggeshall Road (A120). The majority of the IWMF Site comprises bare made ground following groundworks to landform the overburden placed at the IWMF Site as part of the quarry restoration works (Figure 1.2). Development platforms and access routes have been created through the construction area of the IWMF Site.
- 2.2.7 A group of low-storey timber-framed buildings and structures are located in the south east of the IWMF Site associated with the Grade II listed Woodhouse Farm. These comprise Woodhouse Farm, adjacent outbuildings and a hand water pump. A group of trees located immediately along the eastern and southern boundaries of the IWMF Site have a Tree Protection Order (TPO) and have been retained.

IWMF Site History

- 2.2.8 The IWMF Site is located within the confines of the former World War II (WWII) Rivenhall Airfield. Remnants of an aircraft hangar (two side-by-side lamella hangars), airfield buildings and associated runways were present on the Site until 2012 before clearance works were implemented under the 2010 Permission.

2.3 Surrounding Area

Land Uses

- 2.3.1 Except for the quarry, the Site is located within a predominantly rural character area, consisting of arable crops in large fields, often without boundaries resulting in an open landscape. A small industrial estate is located approximately 400m to the south east on Allshots Farm.
- 2.3.2 The landform around the Site forms a relatively flat plateau at approximately 50m Above Ordnance Datum (AOD), although the restored minerals workings to the north of the Site are at a lower level.
- 2.3.3 The nearest residential property is The Lodge, Woodhouse Lane, approximately 425m to the east of the Site. The only other residential properties located within a 1km radius of the Site are Sheepcotes Farm and Haywards, approximately 750m west and 950m north east from the Order Limits respectively.
- 2.3.4 The village of Silver End is located approximately 1km to the west of the Order Limits, with Coggeshall, Rivenhall, Kelvedon and Witham approximately 3.5km north west, 2.3km south, 3.5km south west and 4km south respectively. Braintree is located circa 4.5km to the east.

Figure 2.1: Construction Status of the Consented Scheme



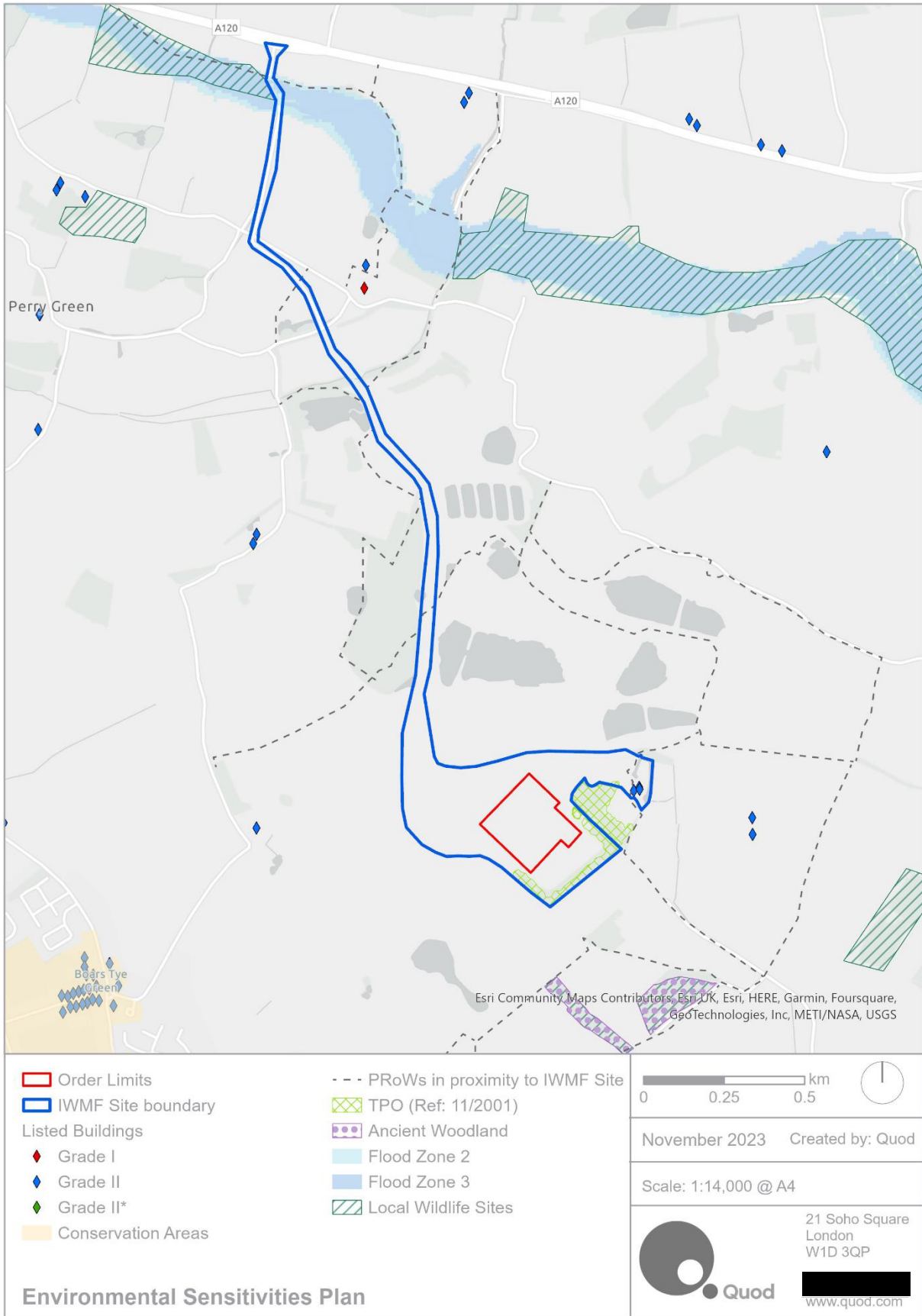
Transport and Access

- 2.3.5 The access route to the Site comprises an existing two-way access road from the A120 to the north. This is shared with the existing Bradwell Quarry and has junctions with Church Road and Ash Lane along its length.
- 2.3.6 Three Public Rights of Way (PRoW) north west of the Site transverse the access road and one passes through the eastern part of the Woodhouse Farm complex to the north east. The alignment of these are illustrated on Figure 2.2.

Site and Surrounding Sensitivities

- 2.3.7 Figure 2.2 identifies the key environmental sensitivities within and close to the Site.
- 2.3.8 The Site is not subject to any statutory or non-statutory designations for nature conservation or heritage. There are no World Heritage Sites, Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields or locally listed buildings within 1km of the Order Limits.
- 2.3.9 Two Grade II listed buildings associated with Woodhouse Farm are located approximately 180m north east of the Site, subject to the Listed Building Consent associated with the Consented Scheme. An ecological mitigation area associated with the IWMF excavation works is located to the east of Woodhouse Farm.
- 2.3.10 There are three other Grade II Listed properties within a 1km radius of the Site, including Allshots Farmhouse, Allshots Barn (c.450m east) and Sheepcotes Farm (c.750m west). The Grade I listed Parish Church of the Holy Trinity is located approximately 300m east of the access road, 2km north of the Site.
- 2.3.11 The Site is not located within or in proximity to a Conservation Area. The closest is the Silver End Conservation Area located approximately 1.2km south west of the Order Limits.
- 2.3.12 The closest ecological designated sites are Storey's Wood Local Wildlife Site (LWS) and Upney Wood LWS approximately 290m south and 900m south east of the Site respectively. The closest statutory designated ecological site is Brockwell Meadows Local Nature Reserve (LNR) approximately 4.5km south east.
- 2.3.13 Based on the Environment Agency flood maps, the Site is shown to be located within Flood Zone 1 (low probability of fluvial flooding) and has a low probability of surface water flooding.
- 2.3.14 There is no Air Quality Management Area (AQMA) on or in the vicinity of the Site or its associated access route.

Figure 2.2: Environmental Sensitivities Map



IWMF Site Environmental Sensitivities

- 2.3.15 As illustrated on Figure 2.2, the IWMF Site is not subject to any statutory or non-statutory designations for nature conservation or heritage. The listed buildings associated with Woodhouse Farm are encompassed by the IWMF Site boundary. A number of other Grade II listed buildings are located in proximity to the IWMF Site's access road, with the closest being the ancillary buildings associated with Bradwell Hall located 200m east. The Grade I listed Parish Church of the Holy Trinity is located circa 170m east of the IWMF Site's access road.
- 2.3.16 In addition to the ecological designated sites described earlier in this chapter, the Blackwater Plantation LWS abuts the western boundary of the IWMF Site's access route boundary, circa 2.3km north of the Order Limits.
- 2.3.17 The River Blackwater, identified by the Environment Agency as a 'Main River' intersects the northern part the access route associated with the IWMF Site. Immediately surrounding this watercourse, the area is shown to be located within Flood Zone 3 with a high probability of surface water flooding. The rest of the IWMF Site is located in Zone 1 with low/ very low probability of surface flooding.

2.4 The Consented Scheme

- 2.4.1 Planning permission was granted by ECC for a Section 73 application in February 2016 for the Consented Scheme (Ref. ESS/34/15/BTE), with subsequent non-material amendments. This is deemed to be the '*operative permission*' for the Site. Relevant planning conditions associated with this permission are defined in **ES Volume 2, Appendix 2.1: Relevant Planning Conditions of Consented Scheme (Doc Ref. 6.2)**.
- 2.4.2 An associated Environmental Permit was issued in 2017 to operate an IWMF, including EfW plant, which utilised a 58m high stack above ground level (agl). An Environmental Permit Variation was issued in June 2020 for a reduced stack height (35m agl), revised abatement techniques and revised emission limits. This permit aligns to the stack height granted for the Consented Scheme and was transferred to the Applicant in April 2021.
- 2.4.3 The Consented Scheme is defined as:

“Integrated Waste Management Facility comprising: Anaerobic Digestion Plant treating mixed organic waste, producing biogas converted to electricity through biogas generators; Materials Recovery Facility for mixed dry recyclable waste to recover materials e.g. paper, plastic, metals; Mechanical Biological Treatment facility for the treatment of residual municipal and residual commercial and industrial wastes to produce a solid recovered fuel; De-inking and Pulping Paper Recycling Facility to reclaim paper; Combined Heat and Power Plant (CHP) utilising solid recovered fuel to produce electricity, heat and steam; extraction of minerals to enable buildings to be partially sunken below ground level within the resulting void; visitor/education centre; extension to existing access road; provision of offices and vehicle parking; and associated engineering works and storage tanks.”

Layout of Consented Scheme

2.4.4 The planning permission for the IWMF comprises the following components:

- a reception hall;
- a materials recovery facility;
- a mechanical biological treatment plant;
- an anaerobic digestion facility;
- a paper pulping plant;
- a waste water treatment plant;
- a combined heat and power plant (i.e., the EfW plant); and
- a biogas energy plant.

2.4.5 The Consented Scheme also comprises restoration works to Woodhouse Farm buildings as an educational visitor centre, with space for a heritage area for the WWII airfield. Associated car and coach parking for the public would also be provided. A listed building consent granted in September 2017 by Braintree District Council is also associated with these works. Further applications for listed building consents and planning permissions relating to the works to Woodhouse Farm are pending before Braintree District Council.

2.4.6 Figure 2.3 shows the layout of the Consented Scheme within the IWMF Site.

Figure 2.3: Consented Scheme Layout



Consented Scheme Development

EfW Process

- 2.4.7 Figure 2.4 illustrates the full combustion and energy generation process in the reception hall and EfW plant of the Consented Scheme. More specifically, Figure 2.5 illustrates the waste process line and Figure 2.6 illustrates the electricity generation line.
- 2.4.8 Waste is delivered to the reception hall, tipped into a bunker and then transferred from the bunker to the furnace, where it is combusted. Air for combustion is extracted from the reception hall and bunker to avoid the release of odours.
- 2.4.9 The combustion of waste leads to the generation of hot flue gases, which are maintained at more than 850°C for more than two seconds to ensure full combustion. The hot flue gases pass through the boiler where the heat is used to generate high pressure steam. The cooled flue gases are then passed through a comprehensive flue gas treatment system, which reduces the concentrations of pollutants in the flue gases to well below the permitted emission levels set in the Environmental Permit before the cleaned flue gases are released to atmosphere via a stack.
- 2.4.10 The high pressure steam which has been generated is sent to a steam turbine to generate electricity. The high pressure, high temperature steam expands and cools as it passes through and drives the turbine and becomes low pressure steam. Then, this low pressure steam is condensed to water in the air-cooled condenser. The water is returned to the boiler to be turned into high pressure steam again. Water would be recirculated with no external discharge from the IWMMF building. A set of inlet control valves control the amount of steam that is allowed to reach the turbine. Steam that is not sent to the turbine is sent directly to the air-cooled condenser via a bypass valve.
- 2.4.11 Once constructed and operational, the Consented Scheme will create an electrical output of up to 49.9MW.

Figure 2.4: Full Combustion and Energy Generation Process Flow

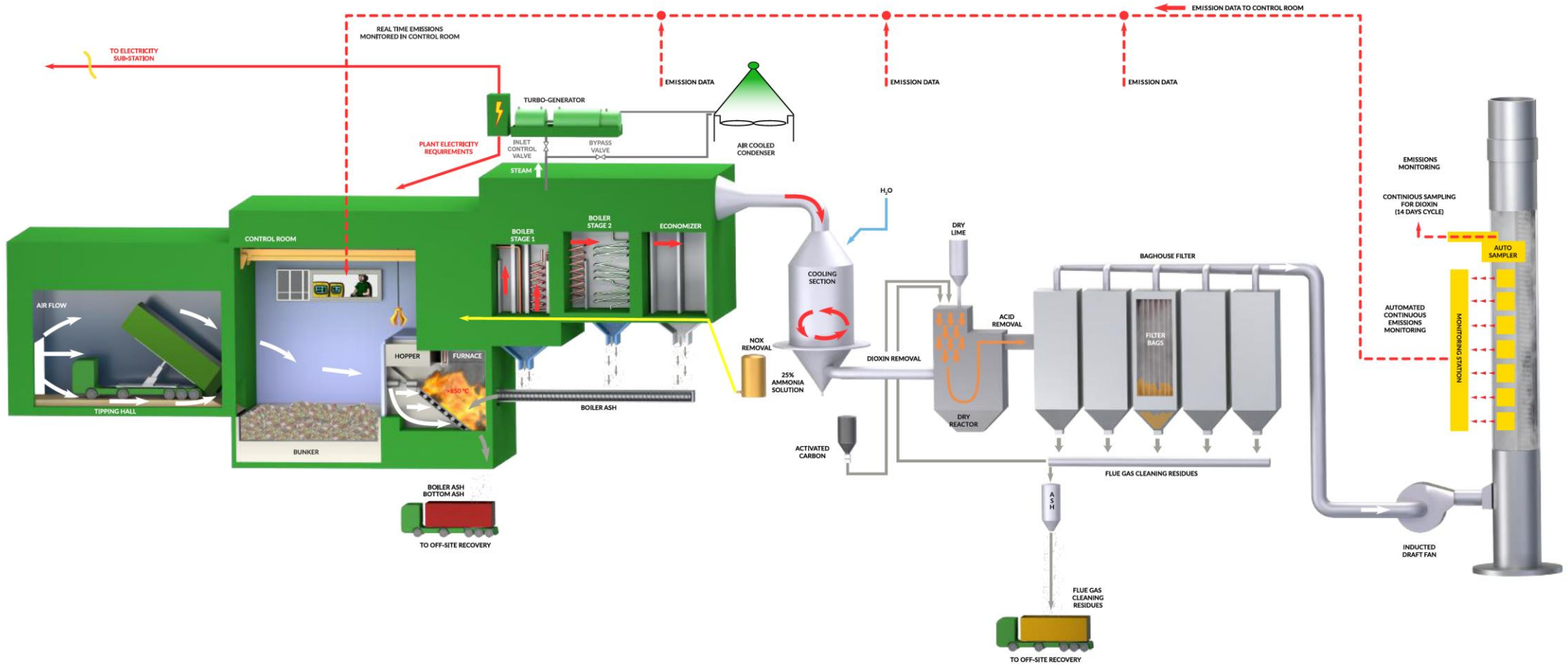


Figure 2.5: Waste Process Line

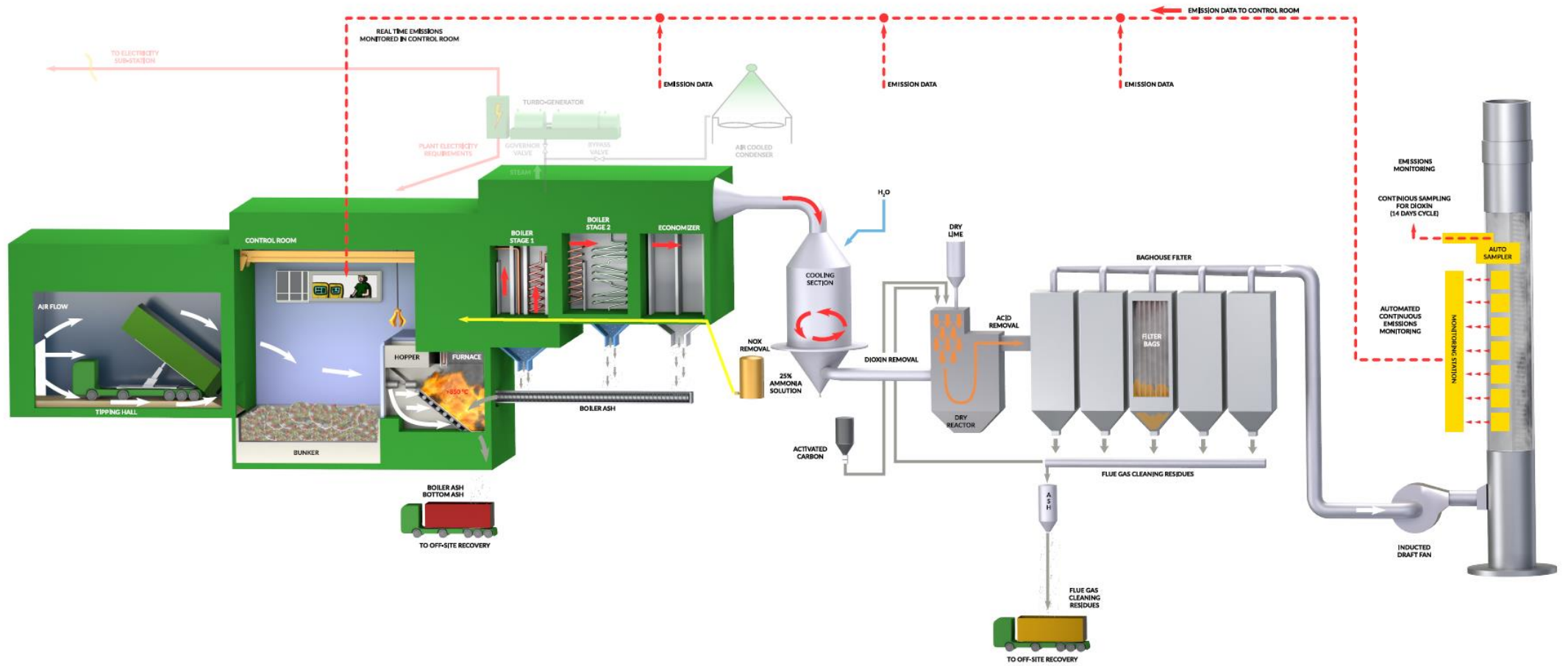
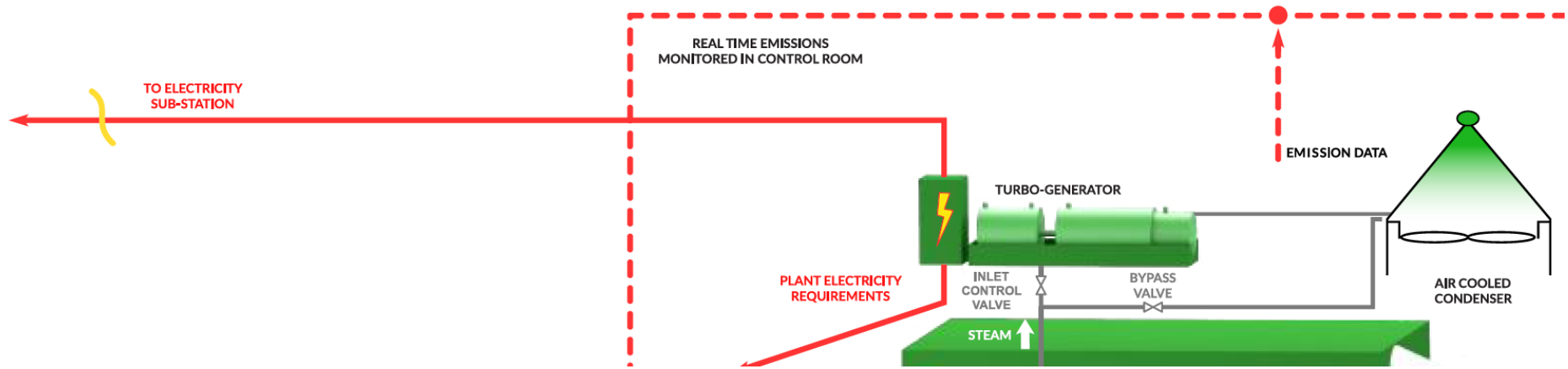


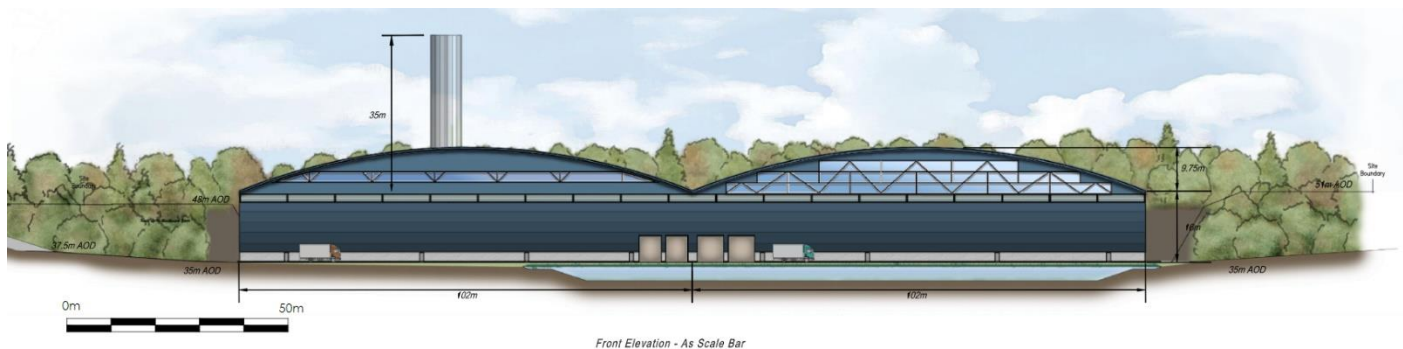
Figure 2.6: Electricity Generation Line



Building Envelope and Appearance

2.4.12 The area of the Consented Scheme IWMF building extends to circa 5.5ha. This will be steel framed, with darkly coloured profiled metal cladding and a horizontal profile. The low-profiled roof will be double-arched to reflect the design of the former WWII hangers on the Site (Figure 2.7). This will be vegetated to provide a green roof that will enhance biodiversity and optimise drainage. A 7m diameter stainless steel chimney will extend 35m above ridge height (no more than 85m Above Ordnance Datum (AOD), as per Condition 56). The windows would be fitted with louvres and outdoor lighting fitted with directional cowls to minimise light escaping into the wider landscape.

Figure 2.7: Consented Scheme Front Elevation



2.4.13 The buildings and associated structures at Woodhouse Farm are retained for refurbishment within their existing footprints and the general heights and massing would be preserved. The buildings would be reroofed in red clay tiles in keeping with the local vernacular style. Walls would be finished in red brick, black weatherboarding or render depending on the buildings' former use and finish.

Grid Connection

2.4.14 The Applicant has entered into a contract with UKPN in respect of the 132kV grid connection for the Consented Scheme. The connection will run along the access road from the IWMF Site as far as Ash Lane and then the route follows various minor roads to the Braintree substation. Permitted development rights under Class B(a) Development by an Electricity Undertaking under Part 15 of the Town and Country Planning (General Permitted Development) (England) Order 2015 permit statutory undertakers, such as UKPN, to lay such a connection underground in public highway or other open ground.

Waste Inputs, Processing and Residues

2.4.15 The Consented Scheme can receive a variety of wastes, such as mixed organic wastes (MOWs), recyclate, municipal solid wastes (MSWs) and commercial and industrial (C&I) wastes, and Solid Recovered Fuel (SRF).

2.4.16 Wastes received will be processed through several treatment routes including:

- Materials recovery facility;
- Anaerobic digestion plant;

- Mechanical biological treatment plant; and
- EfW plant.

- 2.4.17 Condition 29 limits the total waste inputs of the Consented Scheme to a maximum of 853,000 tonnes per annum of municipal solid waste and commercial and industrial waste. The total waste inputs would not be changed by this proposal.
- 2.4.18 The consented EfW plant can combust 595,000 tonnes of waste per annum and is limited to generate no more than 49.9MW (in accordance with its planning permission granted under the Town and Country Planning Act 1990¹) and the Environmental Permit.
- 2.4.19 Unloading of waste will take place within reception halls in a controlled environment created using appropriate airflow management. Roller shutter doors will close automatically when not in use to minimise potential nuisance emissions such as dust and odour. The building is designed to control and minimise any potential dust and noise emissions.
- 2.4.20 Re-useable recyclate that may be produced will be transported off-site and reintroduced into the secondary materials market. Ash and air pollution control residues from the EfW plant will also be transported off-site for processing into secondary aggregate materials.

Water Management

- 2.4.21 Water is required by the IWMF for a number of operational elements such as boilers or sprinklers. An existing 150mm diameter mains water connection provides mains water supply to the IWMF Site. There is no discharge of process water or trade effluent from the IWMF.

Landscaping

- 2.4.22 The majority of the IWMF Site is clear of vegetation due to the former quarrying activities. Existing bands of trees line the north eastern, south eastern and south western borders of the consented IWMF building, as shown on Figure 2.3. These are proposed to be retained and enhanced with additional areas of mixed woodland planting to the north and north west. Peripheral trees, woodland/scrub are also being retained along parts of the east and south eastern IWMF Site boundaries. In addition, proposed areas of mixed shrub or grassland planting will be implemented along the access road.
- 2.4.23 The areas of existing woodland surrounding Woodhouse Farm have been retained and enhanced, with planting and landscaping works to be carried out along the western boundary of Woodhouse Farm to screen the proposed visitor and coach park from the IWMF building. Areas of open habitat have been established adjacent to Woodhouse Farm for Great Crested Newts.
- 2.4.24 Condition 54 of the planning permission for the Consented Scheme has been discharged, with a Habitat Management Plan agreed for the IWMF Site. This sets the framework for the reestablishment of landscape and biodiversity features on the

IWMF Site, including management and monitoring procedures to ensure these features remain at a favourable conservation status. Key principles of mitigation and management are as follows:

- retention of an area of approximately 1.44ha of broad-leaved semi-natural woodland in the south eastern area of the IWMF Site;
- creation of new bands of broad-leaved semi-natural woodland around the perimeter of the IWMF building, with additional tree planting to the south east outside the IWMF Site;
- c.2km of native hedgerow planting along the proposed access road extension and around parking areas and paths within the IWMF Site;
- creation of areas of new species-rich grassland within the IWMF Site;
- creation of new surface water bodies within the IWMF Site;
- provision of a sedum-based green roof on the IWMF building; and
- provision of bat boxes to increase provision of bat roosting habitat.

2.4.25 A TPO consent was granted in December 2021 (Ref. 21/03318/TPO) and works have been carried out to remove dangerous, damaged and diseased trees, along with other woodland management activities. Around 2,000 trees and shrubs have been planted along the southern boundary of the Site, and landscaping works are underway across the rest of the Site. Around 30,000 trees and shrubs will be planted.

Drainage

2.4.26 Conditions 22 and 23 of the planning permission for the Consented Scheme have been discharged providing details of the foul and surface water drainage strategy for the Consented Scheme respectively.

2.4.27 A surface water collection lagoon has been developed as part of the drainage and water use strategy for the Consented Scheme.

2.4.28 Upper Lagoon is a large freshwater storage area located c.40m north west of the IWMF building. This has been constructed below ground level to collect and store water from rainfall and surface water runoff, groundwater and treated water from operation of the Consented Scheme. The construction and use of this lagoon would not be changed by the Proposed Development.

Access and Parking

2.4.29 Access to the Site is from the A120, via the access route to Bradwell Quarry that was constructed for sand and gravel operations. The Consented Scheme made provision for this access road to be extended, realigned and upgraded through discharge of Condition 6, with improvements to existing crossing points discharged under Conditions 31 and 63.

2.4.30 Car and coach parking provision is provided adjacent to the nearby Woodhouse Farm complex. Details of this parking have been discharged under Condition 61.

- 2.4.31 Heavy Goods Vehicles (HGV) will enter the IWMF building in the reception hall to unload residual wastes and load residues. This is in the approximate centre of the building and extends broadly north east/south west across the extent, with access off the Site access road.
- 2.4.32 The access and parking arrangements would not be changed by the Proposed Development.

Traffic Movements

- 2.4.33 Condition 3 of the planning permission for the Consented Scheme limits the daily number of HGV trips arriving at the Site to a maximum of 404 movements during operational weekdays and 202 movements on Saturdays. The total number of vehicle movements would not be changed by the Proposed Development.

Construction of Consented Scheme

Construction Programme

- 2.4.34 Construction works and commissioning of the EfW plant are expected to last until around November 2025, with testing continuing until circa May 2026.

Construction Activities and Controls

- 2.4.35 The planning permission for the Consented Scheme incorporated Conditions to control key elements of the construction works and any relevant environmental mitigation.
- 2.4.36 Construction works comprise levelling of the IWMF Site, extending and upgrading proposed access roads, formation of the proposed lagoon, construction of the IWMF building, installation of the grid connection, associated facilities and parking (including the visitor centre and education centre), and landscaping.
- 2.4.37 Temporary screening, processing and batching plants will be established to maximise the reuse of minerals recovered from the IWMF Site.
- 2.4.38 The major engineering works to be completed to date for the Consented Scheme have been associated with excavation, soil nailing, piling works and construction of building cores (Figure 2.1). These works have resulted in further excavation works to the quarrying restoration activities, involving the removal of sand and gravel and excavation into the underlying London Clay to establish the foundation levels for the facility. This was undertaken to minimise visual impacts.
- 2.4.39 Condition 20 has been discharged which sets out details of the proposed construction compound for the Consented Scheme. Car parking is located approximately 75m to the north of the Site.
- 2.4.40 During the construction phase, the hours of work are 07:00 to 19:00, seven days a week, as controlled by Condition 35 of the Consented Scheme. Conditions 34 and 36 control the permitted hours of construction vehicle movements. Total numbers of construction vehicle movements are controlled by Condition 4, stipulating that the

total number of HGV vehicle movements (including deliveries of building materials) when combined with the maximum permitted vehicle movements under Condition 3 shall not exceed 404 movements per day (Monday to Sunday). These limits would not be changed by the Proposed Development.

- 2.4.41 Construction lighting details have been agreed with the Waste Planning Authority (WPA) through the discharge of Condition 43. The construction lighting scheme comprises 6m high lighting columns within the main construction area, with additional low level lighting around the accommodation compound. No construction lighting shall exceed 5 lux average luminance. During construction of the IWMF, lighting will not be illuminated outside the hours of 07:00 and 19:00 Monday to Sunday, and at no time on Bank or Public Holidays except for security and safety lighting activated by sensors. These limits would not be changed by the Proposed Development.
- 2.4.42 Details of construction dust mitigation and odour control for the Consented Scheme have been discharged through Conditions 51(a) and 52(a). In relation to construction of the IWMF, the use of water spraying will be in operation in working areas and on the site access road. Construction vehicle traffic will be required to adhere to speed limits to minimise dust nuisance. Any other construction operations likely to cause dust or odour nuisance, will be carried out in accordance with site specific method statements and risk assessments to assure the control and mitigation at the point of source. Construction noise sources will be controlled by industry standard good practice measures including the selection of appropriate construction techniques.
- 2.4.43 A Construction Environmental Management Plan ('CEMP') defines the site-specific construction management and mitigation measures to be applied to reduce the potential for significant environmental effects. A CEMP was prepared by the contractor for the initial enabling works phases of the Consented Scheme. CEMPs will be developed for later phases.

Operation of Consented Scheme

- 2.4.44 As set out above, the operational IWMF would involve the processing and treatment of wastes, and combustion of residual waste to generate hot flue gases and generate electricity. An estimated 60 staff will be required to operate the IWMF.
- 2.4.45 The permitted hours of operation for the receipt of incoming waste and departure of outgoing recycled, composted materials, ash and residues etc. are 07:00 to 18:30 Monday to Friday and 07:00 to 13:00 Saturday with no normal deliveries on Sundays and Public Holidays, as controlled by Condition 3. The permitted hours allow potential deliveries from ECC's Waste Disposal Authority (WDA) outside of these hours. These limits would not be changed by the Proposed Development.
- 2.4.46 The internal operational processes of the Consented Scheme will be operated on a 24-hour basis. These will not involve external activities involving large-scale plant or equipment, with no waste to be received during the period between 18:30 and 07:00.

Environmental Monitoring

- 2.4.47 Once operational, an emissions monitoring programme will be implemented to monitor and control the Consented Scheme under a range of operation conditions. Aspects to be monitored include air quality and dust, odour, surface and groundwater, and waste. Continuous, daily, weekly, monthly, biannual and annual monitoring regimes will be implemented depending on the environmental aspect being monitored, as agreed with the Environment Agency in accordance with the Environmental Permit and Planning Authority via the relevant planning conditions, including Conditions 24, 41 and 51. This monitoring would not be changed by the Proposed Development.

Decommissioning of Consented Scheme

- 2.4.48 The Environmental Permit application included a commitment to prepare a Closure Plan for the Consented Scheme at the appropriate time and included a list of generic measures to be considered in the Closure Plan.

References

¹ HMSO, (1990). Town and Country Planning Act 1990. United Kingdom: Central Government.

