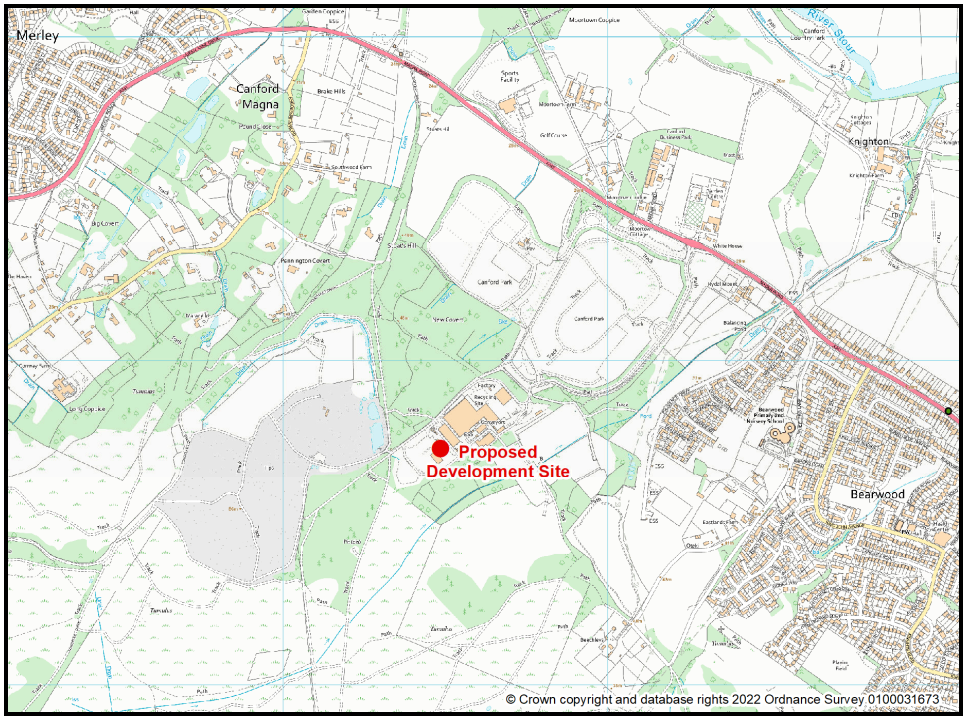
CANFORD ENERGY FROM WASTE COMBINED HEAT AND POWER FACILITY:

2026 UPDATE OF BASELINE CONDITIONS



April 2026

Report Reference: C109-P04-R01

Gair Consulting Ltd
Independent Air Quality & Odour Specialists

CONTENTS

1 BASELINE CONDITIONS AIR QUALITY

1.1 AMBIENT AIR QUALITY MONITORING

This section provides an assessment of baseline conditions for the Proposed Development and its surroundings. The assessment of impacts requires an analysis of the change in pollutant concentrations with the relevant air quality assessment level taking into account background concentrations of the pollutant. Background monitoring data is not always available locally, particularly in areas that have good air quality. However, it is normal practice to obtain data from a comparable location to describe the air quality at the site. Therefore, air quality at the EfW CHP Facility has been characterised based on monitoring data and modelled data obtained from national and local sources.

BCP Council carried out automatic ambient air quality monitoring of NO_2 at two sites in 2025. Both monitoring sites are affiliated to the Department for Environment, Food and Rural Affairs (Defra's) Automatic Urban and Rural Network (AURN). One of these (BORN) is located in Bournemouth 9.5 km to the east-southeast of the Proposed Development and is classed as an urban background site. Monitoring of the oxides of nitrogen (NO_x), ozone and $PM_{2.5}$ is carried out at this location. The other monitoring site is located in Christchurch (CHBR), 3.3 km to the east-southeast of the Proposed Development and is classed as a roadside site. Monitoring of NO_x and $PM_{2.5}$ is undertaken at this location. BCP council also has an extensive network of diffusion tube locations for monitoring of nitrogen dioxide (NO_2) within its administrative area.

1.2 NITROGEN DIOXIDE (NO_2)

BCP Council had a network of diffusion tube sites for monitoring NO_2 in 2025. The majority of these are located at roadside sites within more urban areas than the Proposed Development. However, there are four monitoring locations within 3 km of the Proposed Development. The location of these is presented in *Figure 1.1* and the site locations are described in *Table 1.1*.

Measured concentrations of NO_2 at the four diffusion tube monitoring sites and the two continuous monitor sites between 2017 and 2021 are presented in *Table 1.2*.

TABLE 1.1 DETAILS OF NITROGEN DIOXIDE DIFFUSION TUBE MONITORING SITES

Location	Site Type	Distance to Relevant Exposure	Distance to Kerb of Nearest Road
P1. Gravel Hill	Kerbside	35.5 m	1.0 m
P14. Dolbery Road North	Kerbside	12.1 m	0.5 m
P25. 94 Magna Road	Roadside	13.9 m	1.5 m
P26. Canford Village	Kerbside	1.6 m	1.0 m

FIGURE 1.1 DIFFUSION TUBE LOCATIONS WITHIN 3 KM OF THE FACILITY

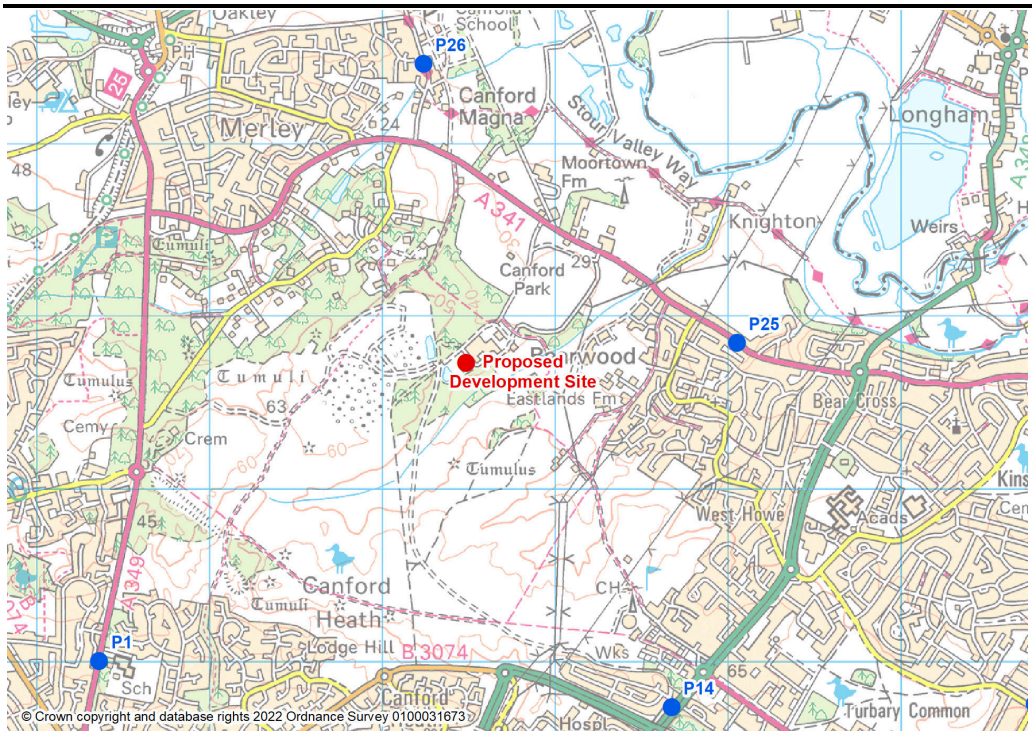


TABLE 1.2 ANNUAL MEAN CONCENTRATIONS OF NO_2 (µg m^{-3})

Site	Type (a)	2022	2023	2024	2025
BORN	UB	10.1	10.0	7.6	8.3
CHBR	UT	17.2	16.3	12.3	13.8
P1. Gravel Hill	K	12.6	10.9	17.6	18.7
P14. Dolbery Road North	K	19.1	17.5	15.1	15.2
P25. 94 Magna Road	R	16.8	17.9	14.8	13.5
P26. Canford Village	K	11.2	10.7	8.4	10.3

(a) Key: R = Roadside, K = Kerbside, UB = Urban Background, UT = Urban Traffic, I = Industrial

(b) Not available

The average measured concentrations between 2022 and 2025 for the six sites is 13.6 µg m^{-3} (34% of the air quality objective of 40 µg m^{-3}).

Annual mean NO_2 background concentrations for 2026 have also been obtained from the Defra UK Background Air Pollution Maps. The latest background maps were issued in November 2024 and are based on 2021 monitoring data. The 2026 mapped annual mean NO_2 background concentration for the Proposed Development and surrounding area is 8.7 µg m^{-3}, 22% of the air quality objective. This is the maximum for the nine 1 km^2 grid squares surrounding the Proposed Development. This is substantially lower than measured at the roadside/kerbside monitoring sites.

For the purposes of the assessment, a background concentration of 13.6 µg m^{-3} has been adopted as measured as an average at the six BCP Council sites between 2022 and 2025. This has decreased from 19.6 µg m^{-3} (31% reduction) as adopted for the 2024 ES Addendum which were based on 2019 monitoring data. This is considered to be representative of a worst-case and is used to avoid underestimating the contribution from other local sources, including future permitted development within the local area.

1.3 FINE PARTICLES (PM_{10} AND $PM_{2.5}$)

BCP Council undertook automatic monitoring of $PM_{2.5}$ only. Measured concentrations between 2022 and 2025 are provided in *Table 1.3*.

TABLE 1.3 ANNUAL MEAN CONCENTRATIONS OF $PM_{2.5}$ (µg m^{-3})

Site	Type (a)	2022	2023	2024	2025
BORN	UB	10.3	8.7	7.5	8.4
CHBR	UT	11.1	8.9	7.8	9.7

(a) Key: R = Roadside, K = Kerbside, UB = Urban Background, UT = Urban Traffic, I = Industrial

(b) Not available

Measured annual mean concentrations between 2022 and 2025 were between 7.5 and 10.3 µg m^{-3} at the Bournemouth site and between 7.8 and 11.1 µg m^{-3} at the Christchurch site. These are well below the target value for $PM_{2.5}$ of 20 µg m^{-3}. Highest concentrations at both sites were measured in 2022 and concentrations have decreased for all years since then. BCP Council did not undertake any continuous monitoring of PM_{10}.

The maximum Defra background mapped concentrations for 2026 is 11.1 µg m^{-3} for PM_{10} and 7.1 µg m^{-3} for $PM_{2.5}$ for the nine 1 km^2 grids located around the Proposed Development. Mapped concentrations of $PM_{2.5}$ are lower than measured at the two continuous monitoring sites. As a very precautionary approach, the background $PM_{2.5}$ concentration is assumed to be 11.1 µg m^{-3}, maximum measured concentration for the four years. A precautionary PM_{10} concentration has been derived based on the difference between mapped concentrations of PM_{10} and $PM_{2.5}$ and measured

concentrations of $PM_{2.5}$. This provides a precautionary annual mean concentration for PM_{10} of 17.4 $\mu g\ m^{-3}$ (11.1*11.1/7.1). As for NO_2, these are considered to be representative of a worst-case and are used to avoid underestimating the contribution from other local sources, including future emission sources within the local area.

1.4 SULPHUR DIOXIDE (SO_2)

Automatic monitoring of SO_2 concentrations is not currently undertaken by BCP Council. The Defra mapped background SO_2 concentrations for the area have been obtained for 2001 and the maximum for the 1 km^2 grids surrounding the site is 6.6 $\mu g\ m^{-3}$. Concentrations of SO_2 are presented for 2001, which is the most recent mapped data available and represents a worst-case for the area. Therefore, for the purposes of the assessment an annual mean SO_2 concentration of 6.6 $\mu g\ m^{-3}$ has been assumed.

1.5 CARBON MONOXIDE (CO)

BCP Council did not undertake routine monitoring of carbon monoxide within its administrative area. The Defra mapped background CO concentrations for the area surrounding the site indicate annual mean concentrations of 342 $\mu g\ m^{-3}$ would be appropriate without the application of a yearly adjustment factor as these are no longer provided by Defra.

Therefore, the background annual mean CO concentration for the area is assumed to be 342 $\mu g\ m^{-3}$.

1.6 HYDROGEN FLUORIDE (HF)

Measurements obtained in the UK between 1984 and 1986 in the Marston Vale region of Bedfordshire where there was a high density of brickworks, a known source of HF, revealed monthly mean concentrations of 0.040 to 0.86 $\mu g\ m^{-3}$ [1]. Daily mean concentrations of up to 2.2 $\mu g\ m^{-3}$ were also measured. These concentrations would not be characteristic of measured concentrations around the Installation Site as there are no significant sources of HF in the area and concentrations measured forty years ago would not reflect present day regulatory controls. Data provided by the UK National Atmospheric Emissions Inventory (NAEI) indicates that emissions of HF have reduced from around 8 kilotonnes per annum (kt/a) in 1993 to less than 1 kt/a in 2021 mainly due to the decommissioning of coal fired power stations.

Information provided by the World Health Organization (WHO) in 2002 [2] indicated that in areas not in the direct vicinity of emission sources, the mean concentrations of fluoride in ambient air would be generally less than 0.1

1 EPAQS (February 2006), Guidelines for Halogen and Hydrogen Halides in Ambient Air for Protecting Human Health Against Acute Irritancy Effects.

2 Fluorides, Environmental Health Criteria 227, World Health Organization (2002)

µg m^{-3}. Therefore, given the reduction in emissions since this time it is concluded that a concentration of 0.1 µg m^{-3} as an annual mean would be representative of the worst-case for the Proposed Development.

1.7 HYDROGEN CHLORIDE (HCL)

Ambient monitoring of hydrogen chloride is carried out as part of the Defra Acid Gases and Aerosol Network (AGAnet) at a number of locations around the UK. The nearest monitoring station to the Proposed Development is located at Chilbolton Observatory in Hampshire, designated as a rural background site. This is located around 55 km to the northeast of the Proposed Development. In 2015 (last year data available), the monthly mean HCl concentration at this site varied between 0.01 and 0.26 µg m^{-3} with an average of 0.14 µg m^{-3}.

The maximum measured monthly mean concentration in 2015 (0.26 µg m^{-3}) is assumed to provide a reasonable estimate of the annual mean background concentration of HCl at the Proposed Development.

1.8 TOTAL ORGANIC CARBON (TOC) AS 1,3-BUTADIENE

BCP Council do not undertake ambient monitoring of 1,3-butadiene or other volatile organic compounds (VOCs). Therefore, concentrations have been obtained from the Defra UK Background Air Pollution Maps. The mapped 1,3-butadiene concentrations are based on 2001 monitoring data, projected to 2003. This is the most recent projection available and is assumed to be representative of concentrations in future years.

The maximum estimated 2003 annual mean background 1,3-butadiene concentration for the area surrounding the Proposed Development is 0.18 µg m^{-3}.

1.9 POLY AROMATIC HYDROCARBONS (PAHS) AS BENZO(A)PYRENE

Monitoring of benzo(a)pyrene (BaP) is currently carried out by Defra at a number of locations in the UK as part of the TOMPs and PAH monitoring and analysis network. The nearest monitoring site is located at Southampton Centre and is an urban background site where monitoring commenced in July 2021. Monitoring data for 2025 have not been validated and are incomplete but measured annual mean concentrations between 2022 and 2024 varied between 0.10 (2024) and 0.19 ng m^{-3} with an average of 0.14 ng m^{-3}.

Southampton Centre is more urban than the Proposed Development Site. Therefore, it is assumed that the three-year average concentration for this site (0.14 ng m^{-3}) is a reasonable estimate of the background concentration in the vicinity of the Proposed Development.

1.10 DIOXINS AND FURANS

Monitoring of PCDD/Fs is currently carried out by Defra at six locations in the UK (Hazelrigg, High Muffles, London, Manchester, Auchencorth Moss and Weybourne) as part of the Toxic Organic Micropollutants (TOMPs) Network.

To provide an indication of the range of PCDD/F concentrations that occur in the UK, a summary of the annual mean concentrations measured between 2014 and 2016 is presented in *Table 1.4*. These are the latest data currently available on the UK-AIR (Air Information Resource) website.

TABLE 1.4 SUMMARY OF ANNUAL MEAN PCDD/F CONCENTRATIONS FOR 2014 TO 2016 (fg TEQ m^{-3}) (a)

Site	Type	2014	2015	2016	Average
London	Urban background	2.9	4.4	21	9.4
Manchester	Urban background	17.0	6.0	12	11.7
Auchencorth	Rural background	0.01	0.01	0.15	0.057
High Muffles	Rural background	1.1	0.5	2.8	1.5
Hazelrigg	Semi-rural background	2.6	5.3	4.6	4.2
Weybourne	Rural background	1.6	1.4	18 (b)	1.5 (c)

(a) Where 1 fg m^{-3} (femtogramme per cubic metre) is equivalent to 1 x 10^{-15} g m^{-3} or 1 x 10^{-9} µg m^{-3}.

(b) Measured annual mean influenced by high concentration of 54 fg TEQ m^{-3} measured during the first quarter, thought to be a local source

(c) Excludes 2016 data

In general, the concentration of dioxins and furans at rural and semi-rural locations are considerably lower than at urban locations. The mean for urban background locations for the three years is 10.6 fg TEQ m^{-3}. Whereas for the rural background sites the mean is 1.8 fg TEQ m^{-3} (excluding 2016 data for Weybourne).

Annual reports on the monitoring network have been published but these only provide data for the urban London and Manchester sites since 2017. This is due to the decline in concentrations across the network. Measured annual mean concentrations between 2021 and 2024 at the London site varied between 9.6 and 11.4 fg TEQ m^{-3} and between 15.7 and 22.3 fg TEQ m^{-3} at the Manchester site. The four year average for the two sites was 10.3 fg TEQ m^{-3} for London and 18.1 fg TEQ m^{-3} for Manchester. These are both higher than measured between 2014 and 2016.

The three-year average concentration measured at the semi-rural background monitoring sites at Hazelrigg from 2014 to 2016 (4.2 fg TEQ m^{-3}) is assumed to

be reasonably representative of the baseline dioxin and furan concentration in the vicinity of the Proposed Development and nearby sensitive receptors.

1.11 POLYCHLORINATED BIPHENYLS

Monitoring of PCBs is currently carried out by Defra at eight locations in the UK as part of the TOMPs Network. The average PCB concentration measured at the urban background monitoring sites (London, Manchester, Cardiff and Belfast) from 2021 to 2024 is 23.8 pg m^{-3} and for the rural background sites (Auchencorth Moss, High Muffles and Weybourne) is 3.4 pg m^{-3}. The four-year average concentration at the semi-rural Hazelrigg site is 4.4 pg m^{-3}. Given the semi-rural nature of the Proposed Development site, the average background concentration at Hazelrigg (4.4 pg m^{-3}) is assumed to be reasonably representative of the baseline PCB concentration in the vicinity of the Proposed Development and nearby sensitive receptors.

1.12 TRACE METALS

Monitoring of trace elements has been undertaken by Defra since 1976. Currently the UK Heavy Metals Monitoring Network comprises 23 monitoring sites at predominantly urban and industrial locations. The nearest monitoring site is located at Chilbolton Observatory in Hampshire. This site is a rural background site.

A summary of the annual average metal concentrations for 2022 to 2024 for this site is provided in *Table 1.5*. Where data are available, measured concentrations are well below their respective EALs. For the purposes of the assessment the maximum annual mean for each metal is used to characterise air quality in the vicinity of the Proposed Development and surroundings.

TABLE 1.5 RANGE OF ANNUAL MEAN TRACE METAL CONCENTRATIONS (2022 TO 2024)

Metal	2022 (ng m^{-3})	2023 (ng m^{-3})	2024 (ng m^{-3})	Assessment Criteria (ng m^{-3})
Antimony (Sb)	Not measured			5,000
Arsenic (As)	0.59	0.51	0.45	6
Cadmium (Cd)	0.080	0.066	0.058	5
Total chromium (Cr)	0.61	0.71	1.1	-
Cobalt (Co)	0.052	0.040	0.032	1,000
Copper (Cu)	2.5	2.3	1.8	-
Lead (Pb)	2.9	2.5	2.2	250
Manganese (Mn)	3.2	2.3	2.0	150
Mercury (Hg)	2.7			-
Nickel (Ni)	0.74	0.42	0.48	20
Thallium (Tl)	Not measured			1,000
Vanadium (V)	0.84	0.68	0.67	-

There are no measurements of antimony, mercury or thallium. There have been some historical measurements of gaseous mercury at a couple of monitoring locations up to 2018 when monitoring appears to have ceased. Measured concentrations of gaseous mercury were measured at the London Westminster site and the Runcorn Weston Point site between 2015 and 2018. London is heavily trafficked and Runcorn Weston Point is heavily industrial. Maxima annual mean concentrations at these two sites for the four years were 2.7 ng m^{-3} and 20.1 ng m^{-3} for the London Westminster and Runcorn Weston Point site, respectively. For the purposes of the assessment, it is assumed that measured concentrations at London Westminster (2.7 ng m^{-3}) are characteristic of the Site and surroundings.

Guidance issued by the Environment Agency [3] for the assessment of Group 3 metals, states that for screening purposes it should be assumed that hexavalent chromium (CrVI) comprises 20% of the total background chromium. On this basis the average CrVI concentration would 0.22 ng m^{-3}, slightly in excess of the EAL of 0.2 ng m^{-3}.

1.13 AMMONIA (NH_3)

The Air Pollution Information System (APIS) provides mapped background ammonia concentrations principally for the assessment of airborne impacts of ammonia on habitat sites. This indicates that background ammonia concentrations in the vicinity of the Proposed Development and surroundings are around 1.2 µg m^{-3}.

1.14 BACKGROUND CONCENTRATIONS FOR COMPARISON WITH CONCENTRATIONS PREDICTED BY DETAILED DISPERSION MODELLING

A summary of the annual mean background concentrations that have been used in the assessment is presented in *Table 1.6*

3 Environment Agency (June 2016) Guidance on Assessing Group 3 Metal Stack Emissions from Incinerators (Version 4)

TABLE 1.6 SUMMARY OF BACKGROUND CONCENTRATIONS FOR THE ASSESSMENT

Pollutant	Averaging Period	Concentration
Particles (PM_{10})	Annual	17.4 µg m^{-3}
	24-Hour	20.5 µg m^{-3} (a)(b)
Particles ($PM_{2.5}$)	Annual	11.1 µg m^{-3}
Nitrogen Dioxide (NO_2)	Annual	13.6 µg m^{-3}
	1-Hour	27.2 µg m^{-3} (a)
Sulphur Dioxide (SO_2)	Annual	6.6 µg m^{-3}
	24-Hour	7.8 µg m^{-3} (a)(b)
	1-Hour	13.2 µg m^{-3} (a)
	15-Minute	17.7 µg m^{-3} (a)(c)
Carbon Monoxide (CO)	Annual	342 µg m^{-3}
	8-Hour	479 µg m^{-3} (a)(d)
	1-hour	684 µg m^{-3} (a)
Hydrogen Fluoride (HF)	Annual	0.1 µg m^{-3}
	Monthly/weekly	0.1 µg m^{-3}
	24-Hour/1-Hour	0.2 µg m^{-3} (a)
Hydrogen Chloride (HCl)	Annual	0.26 µg m^{-3}
	1-Hour	0.52 µg m^{-3} (a)
Total Organic Carbon (as 1,3-butadiene)	Annual	0.18 µg m^{-3}
	24-Hour	0.21 (a)(b)
PAH as Benzo(a)pyrene	Annual	0.14 ng m^{-3}
Dioxins and Furans (PCDD/Fs)	Annual	4.2 fg m^{-3}
Polychlorinated biphenyls (PCBs)	Annual	0.0044 ng m^{-3}
Cadmium (Cd)	Annual	0.080 ng m^{-3}
	24-Hour	0.094 ng m^{-3} (a)(b)
Thallium (Tl)	No data available	
Mercury (Hg)	Annual	2.7 ng m^{-3}
	24-Hour	3.2 ng m^{-3} (a)(b)
	1-Hour	5.4 ng m^{-3} (a)
Antimony (Sb)	No data available	
Arsenic (As)	Annual	0.59 ng m^{-3}
Chromium (Cr)	Annual	1.1 ng m^{-3}
	24-Hour	1.3 ng m^{-3} (a)(b)
Cobalt (Co)	Annual	0.052 ng m^{-3}

TABLE 1.6 SUMMARY OF BACKGROUND CONCENTRATIONS FOR THE ASSESSMENT

Pollutant	Averaging Period	Concentration
Copper (Cu)	Annual	2.5 ng m^{-3}
	24-Hour	3.0 ng m^{-3} (a)(b)
Lead (Pb)	Annual	2.9 ng m^{-3}
Manganese (Mn)	Annual	3.2 ng m^{-3}
	1-Hour	6.4 ng m^{-3} (a)
Nickel (Ni)	Annual	0.74 ng m^{-3}
	1-Hour	1.5 ng m^{-3} (a)
Vanadium (V)	Annual	0.84 ng m^{-3}
	24-Hour	0.99 ng m^{-3} (a)(b)
Ammonia (NH_3)	Annual	1.2 µg m^{-3}
	1-Hour	2.4 µg m^{-3} (a)

(a) 1-hour mean background concentration estimated by multiplying the annual mean by a factor of 2 in accordance with the Risk Assessment Guidance.

(b) 24-hour mean background concentration estimated by multiplying the 1-hour mean by a factor of 0.59 in accordance with the Risk Assessment Guidance.

(c) 15-minute mean background concentration estimated by multiplying the 1-hour mean by a factor of 1.34 in accordance with the Risk Assessment Guidance.

(d) 8 hour mean background concentration estimated by multiplying the 1-hour mean by a factor of 0.70 in accordance with the Risk Assessment Guidance.

2 PREDICTED OPERATIONAL IMPACT ON HABITAT SITES

2.1 CRITICAL LEVELS AND CRITICAL LOADS

2.1.1 Introduction

There are many impacts on ecosystems associated with elevated levels of atmospheric nitrogen and its deposition to sensitive habitats. The most important of these are:

- short-term direct effects of nitrogen gases and aerosols on individual species;
- soil mediated effects;
- increased susceptibility to secondary stress factors, such as drought or frost; and
- changes in (competitive) relationships between species, resulting in loss of biodiversity.

In order to provide benchmark levels, below which significant harmful effects to the environment do not occur, critical levels and critical loads have been developed referring to gaseous airborne concentrations of pollutants and deposition of pollution to land and water, respectively.

2.1.2 Critical Levels

Critical levels are thresholds of airborne pollutant concentrations above which damage may be sustained to sensitive plants and animals. High concentrations of pollutants in ambient air directly cause harm to leaves and needles of forests and other plant communities.

The 2008 Air Quality Directive set limit values for the protection of vegetation and ecosystems and these have been adopted by the Air Quality Strategy, but are not currently set in Regulations. The current critical levels, limit values and objectives are summarised in *Table 2.1*.

TABLE 2.1 CRITICAL LEVELS FOR THE PROTECTION OF VEGETATION AND ECOSYSTEMS

Pollutant	Description	Averaging Period	Concentration (μg m^{-3})
Nitrogen Oxides	Critical Level	Annual mean	30
	Critical Level	Daily mean	75
Sulphur Dioxide	Critical Level for ecosystems dominated by lichens and bryophytes	Annual mean	10
	Critical Level for all other ecosystems	Annual mean	20
Hydrogen Fluoride	Critical Level	Weekly mean	<0.5
	Critical Level	Daily mean	<5
Ammonia	Critical Level for ecosystems dominated by lichens and bryophytes	Annual mean	1
	Critical Level for all other ecosystems	Annual mean	3

2.1.3 Critical Loads

Introduction

Critical loads refer to the threshold beyond which deposition of pollutants to water or land results in measurable damage to vegetation and habitats. This takes the form of either gravitational settling of particulate matter (dry deposition) or wet deposition, where atmospheric pollutants dissolve in water vapour and then precipitate to the ground (e.g. as rain, snow, fog etc.).

The issue for ecosystems is the risk that the deposition rate of acid (acidification) or nutrient nitrogen (eutrophication) may be in excess of the amount that the ecosystem can tolerate. The point at which this occurs is the 'critical load'.

Eutrophication

Critical loads for nutrient nitrogen are determined largely on the basis of the species or habitat type affected. Critical loads have been determined for a number of habitat types at the European level and reflect the way different plants have adapted to differing availabilities of nutrient. Those in nutrient deficient environments, e.g. coastal sand dunes, will be less tolerant of excess nitrogen from aerial deposition.

Critical loads for eutrophication for the habitat types identified for each sensitive habitat receptor have been obtained from the Air Pollution Information System (APIS) [4] and are summarised in *Table 2.2*. These values have been agreed with The Environmental Dimension Partnership (EDP) the project ecologists for the Proposed Development.

4 www.apis.co.uk

TABLE 2.2 CRITICAL LOADS FOR EUTROPHICATION

Habitat Site	Habitat Type	Critical Load (kg N $ha^{-1}a^{-1}$)
H1 Dorset Heaths SAC/SPA/Ramsar	Valley mires, poor fens and transition mires	5 – 15
	Acidophilous Quercus - dominated woodland	10 - 15
H2 Poole Harbour SPA/Ramsar	Coastal dune grasslands (grey dunes) – acid type	5 – 15
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	Bog woodland	5 - 10
H4 Canford Heath SSSI	Bogs	5 - 10
H5 Turbary & Kinson Commons SSSI	Bogs	5 - 10
H6 Hurn Common SSSI	Dwarf shrub heath	5 - 15
H7 Slop Bog & Uddens Heath SSSI	Bogs	5 - 10
H8 Parley Common SSSI	Bogs	5 - 10
H9 Luscombe Valley SSSI	Bogs	5 - 10
H10 Bourne Valley SSSI	Bogs	5 – 10
H11 Holt & West Moors Heath SSSI	Dwarf shrub heath	5 - 15
H12 Corfe & Barrow Hills SSSI	Dwarf shrub heath	5 - 15
H13 Arne SSSI	Bogs	5 - 10
H14 Moors River System SSSI	Broadleaved deciduous woodland	10 - 15
H15 Knighton Heath GC SNCI	Scattered remnants of heath	5 – 10
H16 Alderney Waterworks SNCI	Acid grassland	5 - 10
H17 Haymoor Bottom SNCI	Remnant heath	5 - 15
H18 Arrowsmith Coppice SNCI/AW	Heathland habitats	5 - 15
H19 Delph Woods SNCI	Deciduous woodland	10 - 15
H20 Dunyeats Hill HRS	Heathland	5 - 15
H21 Moortown Copse SNCI	Deciduous woodland	10 – 15
H22 Canford Park SANG LCNR	Neutral grassland	10 – 20
H23 Bearwood SNCI	Woodland	10 – 15
H24 Frogmoor Wood SNCI	Birch woodland	10 - 15

Acidification

For acidic deposition, the critical load of a habitat site is determined mostly by the underlying geology and soils. Alkaline soils have an innate capacity for neutralising acidic deposition, whereas acidic soils do not. The level of acidification depends on the donation of hydrogen ions to the soil arising primarily from deposition of:

- sulphur dioxide, which reacts with water to produce sulphuric acid;
- nitrogen oxides, which react with water to produce nitric acid;
- ammonia, which reacts with water to generate ammonium which is then oxidised to nitrate generating hydrogen ions; and
- acid gases such as hydrogen chloride.

The critical load of acidification is defined by a critical load function which describes the relationship between the relative contributions of sulphur (S) and nitrogen (N) to the total acidification. The critical load function is defined by the following parameters:

- CLmaxS, the maximum critical load of acidity for S, assuming there is no N deposition;
- CLminN, is the critical load of acidity due to nitrogen removal processes in the soil only (i.e. independent of deposition); and
- CLmaxN, is the maximum critical load of acidity for N, assuming there is no S deposition.

The values of these parameters (as provided by APIS) for the selected habitat types are presented in *Table 2.3*.

TABLE 2.3 CRITICAL LOADS FOR ACIDIFICATION (keq $ha^{-1}a^{-1}$)

Habitat Site	Habitat Type	CLminN	CLmaxS	CLmaxN
H1 Dorset Heaths SAC/SPA/Ramsar	Bogs	0.321	0.232	0.553
	Dwarf shrub heath	0.499	0.20	0.699
	Acid grassland	0.366	0.23	0.556
	Coniferous woodland	0.142	0.728	0.87
H2 Poole Harbour SPA/Ramsar	Supralittoral sediment (acidic type)	0.856	4	4.856
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	Bogs	0.321	0.232	0.553
H4 Canford Heath SSSI	Fen, marsh and swamp	0.321	0.25	0.571
H5 Turbary & Kinson Commons SSSI	Fen, marsh and swamp	0.321	0.244	0.565

TABLE 2.3 CRITICAL LOADS FOR ACIDIFICATION (keq $ha^{-1}a^{-1}$)

Habitat Site	Habitat Type	CLminN	CLmaxS	CLmaxN
H6 Hurn Common SSSI	Fen, marsh and swamp	0.642	0.24	0.882
H7 Slop Bog & Uddens Heath SSSI	Fen, marsh and swamp	0.321	0.273	0.594
H8 Parley Common SSSI	Fen, marsh and swamp	0.321	0.266	0.587
	Broadleaved mixed and yew woodland	0.285	0.858	1.143
H9 Luscombe Valley SSSI	Fen, marsh and swamp	0.321	0.238	0.559
H10 Bourne Valley SSSI	Fen, marsh and swamp	0.321	0.259	0.580
H11 Holt & West Moors Heath SSSI	Fen, marsh and swamp	0.321	0.255	0.576
H12 Corfe & Barrow Hills SSSI	Fen, marsh and swamp	0.321	0.246	0.567
H13 Arne SSSI	Bogs	0.321	0.247	0.568
H14 Moors River System SSSI	Woodland	0.142	0.853	0.995
H15 Knighton Heath GC SNCI	Dwarf shrub heath	0.223	0.48	0.703
H16 Alderney Waterworks SNCI	Acid grassland	0.366	0.23	0.596
H17 Haymoor Bottom SNCI	Dwarf shrub heath	0.642	0.24	0.882
H18 Arrowsmith Coppice SNCI/AW	Dwarf shrub heath	0.642	0.23	0.872
H19 Delph Woods SNCI	Deciduous woodland	0.285	0.841	1.126
H20 Dunyeats Hill HRS	Dwarf shrub heath	0.642	0.23	0.872
H21 Moortown Copse SNCI	Deciduous woodland	0.142	1.635	1.777
H22 Canford Park SANG LCNR	Neutral grassland	1.071	4	5.071
H23 Bearwood SNCI	Woodland habitats	0.357	8.508	8.865
H24 Frogmoor Wood SNCI	Deciduous woodland	0.285	0.842	1.127

2.2 BACKGROUND DEPOSITION FLUXES AND AIRBORNE CONCENTRATIONS

2.2.1 Introduction

Information on background nutrient nitrogen deposition, acidification and airborne concentrations of NO_x, NH_3 and SO_2 have been obtained from information provided by the Centre for Ecology and Hydrology (CEH) and available from the Air Pollution Information System (APIS) website.

2.2.2 Airborne Concentrations

Background NO_x, NH_3 and SO_2 concentrations for the area surrounding the Proposed Development have been obtained from the APIS and are summarised in *Table 2.4*. These are the corrected 2021 mid-year values. Background information on concentrations of HF is limited. Therefore, the weekly mean is assumed to be 0.1 µg m^{-3} and an assumed daily mean of 0.2 µg m^{-3} (based on a revised annual mean concentration of 0.1 µg m^{-3} and as was assumed for assessing long-term impacts on human health) and have been updated since the **2024 ES Addendum**.

TABLE 2.4 AIRBORNE CONCENTRATIONS OF NO_x, NH_3 AND SO_2 AT SENSITIVE HABITAT SITES

Habitat	Annual Mean NO_x (µg m^{-3})	24-hour Mean NO_x (µg m^{-3}) (a)	Annual Mean NH_3 (µg m^{-3})	Annual Mean SO_2 (µg m^{-3})
H1 Dorset Heaths SAC/SPA/Ramsar	11.81	13.94	1.12	1.83
H2 Poole Harbour SPA/Ramsar	15.44	18.22	1.15	2.24
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	8.40	9.91	1.06	0.99
H4 Canford Heath SSSI	12.91	15.23	1.15	2.72
H5 Turbary & Kinson Commons SSSI	14.87	17.55	1.11	2.19
H6 Hurn Common SSSI	12.04	14.21	1.03	1.60
H7 Slop Bog & Uddens Heath SSSI	12.87	15.19	1.19	2.07
H8 Parley Common SSSI	11.15	13.16	1.09	1.30
H9 Luscombe Valley SSSI	11.31	13.35	0.89	1.43
H10 Bourne Valley SSSI	16.38	19.33	1.09	2.00
H11 Holt & West Moors Heath SSSI	8.20	9.68	1.26	0.93
H12 Corfe & Barrow Hills SSSI	10.89	12.85	1.20	1.25
H13 Arne SSSI	8.40	9.91	1.06	0.99
H14 Moors River System SSSI	9.84	11.61	1.08	1.11
H15 Knighton Heath GC SNCI	11.81	13.94	1.12	1.83

TABLE 2.4 AIRBORNE CONCENTRATIONS OF NO_x, NH_3 AND SO_2 AT SENSITIVE HABITAT SITES

Habitat	Annual Mean NO_x ($\mu g\ m^{-3}$)	24-hour Mean NO_x ($\mu g\ m^{-3}$) (a)	Annual Mean NH_3 ($\mu g\ m^{-3}$)	Annual Mean SO_2 ($\mu g\ m^{-3}$)
H16 Alderney Waterworks SNCI	12.73	15.02	1.11	1.95
H17 Haymoor Bottom SNCI	16.94	19.99	1.11	2.86
H18 Arrowsmith Coppice SNCI/AW	11.30	13.33	1.19	1.42
H19 Delph Woods SNCI	11.30	13.33	1.19	1.42
H20 Dunyeats Hill HRS	11.30	13.33	1.19	1.42
H21 Moortown Copse SNCI	10.94	12.91	1.12	1.43
H22 Canford Park SANG LCNR	9.96	11.75	1.13	1.24
H23 Bearwood SNCI	10.77	12.71	1.14	1.36
H24 Frogmoor Wood SNCI	11.30	13.33	1.11	1.76

(a) Derived from the annual by multiplying by 2 to generate an hourly mean and 0.59 to convert to a 24-hour mean

2.2.3 Nutrient Nitrogen Deposition (Eutrophication) and Acidification

APIS is able to provide an indication of background nutrient nitrogen deposition and acidification by geographical location and habitat type. The estimates are made from 5 km resolution mapped data, which are derived from a combination of modelling studies and measured deposition and acidification rates. A summary of the background fluxes provided by APIS for habitat sites selected for the assessment is presented in *Table 2.5*. These are the corrected 2021 mid-year values.

TABLE 2.5 BACKGROUND NITROGEN DEPOSITION AND ACIDIFICATION FLUXES

Habitat Type	Background Flux	
	Nutrient Nitrogen (kg N $ha^{-1}a^{-1}$)	Acidification (keq $ha^{-1}a^{-1}$)
H1 Dorset Heaths SAC/SPA/Ramsar		
Heathland habitats	12.69	0.99
Woodland habitats	23.0	1.76
H2 Poole Harbour SPA/Ramsar	12.60	0.97
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	21.29	0.87
H4 Canford Heath SSSI	12.96	1.01
H5 Turbary & Kinson Commons SSSI	12.42	0.96
H6 Hurn Common SSSI	12.11	0.92
H7 Slop Bog & Uddens Heath SSSI	12.92	0.98

TABLE 2.5 BACKGROUND NITROGEN DEPOSITION AND ACIDIFICATION FLUXES

Habitat Type	Background Flux	
	Nutrient Nitrogen (kg N $ha^{-1}a^{-1}$)	Acidification (keq $ha^{-1}a^{-1}$)
H8 Parley Common SSSI		
Heathland habitats	12.38	0.96
Woodland habitats	22.57	1.72
H9 Luscombe Valley SSSI	11.49	0.86
H10 Bourne Valley SSSI	12.42	0.95
H11 Holt & West Moors Heath SSSI	13.38	1.00
H12 Corfe & Barrow Hills SSSI	13.24	1.03
H13 Arne SSSI	11.64	0.87
H14 Moors River System SSSI	22.61	1.69
H15 Knighton Heath GC SNCI	12.74	0.99
H16 Alderney Waterworks SNCI	12.60	0.98
H17 Haymoor Bottom SNCI	12.60	0.97
H18 Arrowsmith Coppice SNCI/AW	13.02	1.01
H19 Delph Woods SNCI	23.66	1.80
H20 Dunyeats Hill HRS	13.02	1.01
H21 Moortown Copse SNCI	23.52	1.80
H22 Canford Park SANG LCNR	12.88	1.00
H23 Bearwood SNCI	23.10	1.78
H24 Frogmoor Wood SNCI	23.24	1.78

2.2.4 Calculation of Acid and Nutrient Nitrogen Deposition

The deposition of acid and nutrient nitrogen is not directly modelled but is derived from the concentration predicted at each sensitive ecological receptor for each pollutant of interest. The derivation is based upon Environment Agency guidance [5] and uses the conversion factors set out in *Table 2.6*. The factors take into account the difference in deposition velocity and mechanisms experienced in woodlands, and grasslands and other non-arboreal areas. For HCl, the acidification is assigned to sulphur.

5 AQTAG06 – Technical Guidance on Detailed Modelling Approach for an Appropriate Assessment for Emissions to Air, Environment Agency, produced 06/02/04, Version 8

TABLE 2.6 FACTORS FOR CONVERSION OF ANNUAL MEAN CONCENTRATIONS TO NUTRIENT NITROGEN AND ACID DEPOSITION

Pollutant	Deposition Velocity – Grasslands (m s^{-1})	Deposition Velocity – Woodlands (m s^{-1})	Conversion Factor (μg m^{-2} s^{-1} to Kg N ha^{-1} $year^{-1}$)	Conversion Factor (kg N ha^{-1} $year^{-1}$ to keq ha^{-1} $year^{-1}$)
SO_2	0.012	0.024	158	0.063
NO_x as NO_2	0.0015	0.003	96	0.071
NH_3	0.02	0.03	260	0.071
HCl	0.025	0.06	307	0.028

AQTAG06 states that the wet deposition of SO_2, NO_2 and NH_3 is 'not significant' within a short range. However, wet deposition of HCl should be considered where a process emits these species. It is considered that within a few kilometres of the source, the wet deposition rate is comparable to the dry deposition rate and with increasing distance, the wet deposition fraction becomes a smaller fraction of the total HCl deposition. As a worst-case, the wet-to-dry deposition ratio is assumed to be 1 at all the identified habitat sites. Therefore, the HCl wet deposition is equivalent to the HCl dry deposition rate (i.e. the total deposition of HCl is twice the dry deposition rate of HCl).

2.3 PREDICTED IMPACT OF EMISSIONS ON HABITAT SITES

2.3.1 Introduction

The impact at all habitat sites is provided. However, it should be noted that the maximum predicted at receptors H2 to H23 are representative of the discrete receptor locations. Where these form component parts of the Dorset Heaths SAC/SPA/Ramsar they may not represent the maximum predicted impact within that component part. However, as the entire Dorset Heaths site is modelled as a polygon receptor, the predicted impact at the Dorset Heaths SAC/SPA/Ramsar (H1) is the maximum predicted anywhere within the European habitat site.

The maximum impact of the EfW CHP Facility on the Dorset Heaths SAC/SPA/Ramsar site occurs within the Canford Heath SSSI component. This maximum occurs close to receptor H15 (Knighton Heath Golf Club SNCI) rather than at the discrete receptors selected for Canford Heath SSSI.

2.3.2 Airborne Concentrations of NO_x, SO_2, NH_3 and HF

NO_x

Predicted maximum concentrations of NO_x, SO_2, NH_3 and HF are presented in *Tables 2.7* to *2.10*, respectively. Maximum concentrations are compared to the relevant critical levels.

TABLE 2.7 MAXIMUM PREDICTED AIRBORNE NO_x CONCENTRATIONS AT HABITAT SITES

Habitat	Annual Mean PC NO_x ($\mu g\ m^{-3}$)	Annual Mean %age Critical Level	24 Hour Mean PC NO_x ($\mu g\ m^{-3}$)	24 Hour Mean %age Critical Level
H1 Dorset Heaths SAC/SPA/Ramsar	0.13	0.4%	4.4	5.9%
H2 Poole Harbour SPA/Ramsar	0.045	0.2%	0.84	1.1%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.028	0.1%	0.44	0.6%
H4 Canford Heath SSSI	0.073	0.2%	2.2	2.9%
H5 Turbary & Kinson Commons SSSI	0.087	0.3%	1.1	1.4%
H6 Hurn Common SSSI	0.057	0.2%	0.40	0.5%
H7 Slop Bog & Uddens Heath SSSI	0.043	0.1%	0.71	0.9%
H8 Parley Common SSSI	0.079	0.3%	0.64	0.9%
H9 Luscombe Valley SSSI	0.027	0.1%	0.40	0.5%
H10 Bourne Valley SSSI	0.057	0.2%	1.0	1.4%
H11 Holt & West Moors Heath SSSI	0.039	0.1%	0.47	0.6%
H12 Corfe & Barrow Hills SSSI	0.043	0.1%	1.2	1.7%
H13 Arne SSSI	0.027	0.1%	0.43	0.6%
H14 Moors River System SSSI	0.063	0.2%	0.51	0.7%
H15 Knighton Heath GC SNCI	0.11	0.4%	1.6	2.1%
H16 Alderney Waterworks SNCI	0.065	0.2%	1.3	1.8%
H17 Haymoor Bottom SNCI	0.077	0.3%	1.4	1.8%
H18 Arrowsmith Coppice SNCI/AW	0.076	0.3%	2.2	3.0%
H19 Delph Woods SNCI	0.065	0.2%	1.9	2.5%
H20 Dunyeats Hill HRS	0.074	0.2%	2.0	2.7%
H21 Moortown Copse SNCI	0.21	0.7%	2.6	3.4%
H22 Canford Park SANG LCNR	0.13	0.4%	1.6	2.2%
H23 Bearwood SNCI	0.19	0.6%	2.3	3.1%
H24 Frogmoor Wood SNCI	0.0031	0.0%	0.45	0.6%
Critical Level	*30*		*75*	

For the European sites and SSSIs, predicted annual mean NOx concentrations are less than 1% of the critical level and would be assessed as 'not significant'. For the locally designated sites, predicted annual mean and 24-hour mean

concentrations of NO_x are less than 100% of the critical levels and would be assessed as 'not significant' in accordance with Environment Agency guidance. Furthermore, the PCs for the locally designated sites are less than 1% and 10% of the critical levels. Therefore, it is concluded that the impact of emissions of NO_x at habitat sites would be 'not significant'.

SO_2

For sulphur dioxide, there are two critical levels (10 or 20 μg m^{-3}) depending on the presence of lichens. For screening purposes, the more stringent critical level of 10 μg m^{-3} has been adopted for all habitats. A comparison of predicted concentrations with this more stringent critical level is provided in *Table 2.8*.

TABLE 2.8 MAXIMUM PREDICTED AIRBORNE SO_2 CONCENTRATIONS AT HABITAT SITES

Habitat	Annual Mean PC SO_2 (μg m^{-3})	Annual Mean %age Critical Level
H1 Dorset Heaths SAC/SPA/Ramsar	0.034	0.3%
H2 Poole Harbour SPA/Ramsar	0.011	0.1%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.007	0.1%
H4 Canford Heath SSSI	0.018	0.2%
H5 Turbary & Kinson Commons SSSI	0.022	0.2%
H6 Hurn Common SSSI	0.014	0.1%
H7 Slop Bog & Uddens Heath SSSI	0.011	0.1%
H8 Parley Common SSSI	0.020	0.2%
H9 Luscombe Valley SSSI	0.007	0.1%
H10 Bourne Valley SSSI	0.014	0.1%
H11 Holt & West Moors Heath SSSI	0.010	0.1%
H12 Corfe & Barrow Hills SSSI	0.011	0.1%
H13 Arne SSSI	0.007	0.1%
H14 Moors River System SSSI	0.016	0.2%
H15 Knighton Heath GC SNCI	0.028	0.3%
H16 Alderney Waterworks SNCI	0.016	0.2%
H17 Haymoor Bottom SNCI	0.019	0.2%
H18 Arrowsmith Coppice SNCI/AW	0.019	0.2%
H19 Delph Woods SNCI	0.016	0.2%
H20 Dunyeats Hill HRS	0.018	0.2%
H21 Moortown Copse SNCI	0.053	0.5%
H22 Canford Park SANG LCNR	0.033	0.3%
H23 Bearwood SNCI	0.049	0.5%
H24 Frogmoor Wood SNCI	0.001	0.0%

TABLE 2.8 MAXIMUM PREDICTED AIRBORNE SO_2 CONCENTRATIONS AT HABITAT SITES

Habitat	Annual Mean PC SO_2 ($\mu g\ m^{-3}$)	Annual Mean %age Critical Level
Critical Level	*10*	

For the European sites and SSSIs, predicted annual mean concentrations are less than 1% of the most stringent critical level and would be assessed as 'not significant'. For the LWS, the PCs are all less than 100% of the critical level. Furthermore, the PCs for the locally designated sites are less than 1% of the critical level. Therefore, it is concluded that the impact of emissions of SO_2 at habitat sites would be 'not significant'.

NH_3

For ammonia, there are also two critical levels depending on the presence of bryophytes and lichens. For screening purposes, the more stringent critical level of 1 $\mu g\ m^{-3}$ has been adopted for all habitats. A comparison of predicted concentrations with this more stringent critical level is provided in *Table 2.9*.

TABLE 2.9 MAXIMUM PREDICTED AIRBORNE NH_3 CONCENTRATIONS AT HABITAT SITES

Habitat	Annual Mean PC NH_3 ($\mu g\ m^{-3}$)	Annual Mean %age Critical Level
H1 Dorset Heaths SAC/SPA/Ramsar	0.0056	0.6%
H2 Poole Harbour SPA/Ramsar	0.0019	0.2%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.0011	0.1%
H4 Canford Heath SSSI	0.0031	0.3%
H5 Turbary & Kinson Commons SSSI	0.0036	0.4%
H6 Hurn Common SSSI	0.0024	0.2%
H7 Slop Bog & Uddens Heath SSSI	0.0018	0.2%
H8 Parley Common SSSI	0.0033	0.3%
H9 Luscombe Valley SSSI	0.0011	0.1%
H10 Bourne Valley SSSI	0.0024	0.2%
H11 Holt & West Moors Heath SSSI	0.0016	0.2%
H12 Corfe & Barrow Hills SSSI	0.0018	0.2%
H13 Arne SSSI	0.0011	0.1%
H14 Moors River System SSSI	0.0026	0.3%
H15 Knighton Heath GC SNCI	0.0047	0.5%
H16 Alderney Waterworks SNCI	0.0027	0.3%
H17 Haymoor Bottom SNCI	0.0032	0.3%
H18 Arrowsmith Coppice SNCI/AW	0.0031	0.3%
H19 Delph Woods SNCI	0.0027	0.3%
H20 Dunyeats Hill HRS	0.0031	0.3%

H21 Moortown Copse SNCI	0.0088	0.9%
H22 Canford Park SANG LCNR	0.0055	0.6%
H23 Bearwood SNCI	0.0081	0.8%
H24 Frogmoor Wood SNCI	0.0001	0.0%
Critical Level	*1*	

For the European sites and SSSIs, predicted annual mean concentrations are less than 1% of the most stringent critical level and would be assessed as 'not significant'. For the LWS, the PCs are all less than 100% of the critical level. Furthermore, the PCs for the locally designated sites are less than 1% of the critical level. Therefore, it is concluded that the impact of emissions of NH_3 at habitat sites would be 'not significant'.

HF

A comparison of predicted weekly and 24-hour mean concentrations with the relevant critical levels for HF is provided in *Table 2.10*. For the European sites and SSSIs, predicted weekly concentrations at the Dorset Heaths SAC exceed 1% of the critical level of 0.5 µg m^{-3} and are potentially significant. However, with the addition of the background concentration, the PEC is 0.11 µg m^{-3} (22.4% of the critical level) and at less than 70% it is unlikely that the critical level would be exceeded. Maximum predicted concentrations are less than 10% of the 24-hour mean critical level of 5 µg m^{-3} and would be assessed as 'not significant'. For the LWS, the PCs are all less than 100% of the critical levels for HF. Furthermore, the 24-hour mean PCs for the locally designated sites are less than 10% of the critical level.

Therefore, it is concluded that the impact of emissions of HF at habitat sites would be 'not significant'.

TABLE 2.10 MAXIMUM PREDICTED AIRBORNE HF CONCENTRATIONS AT HABITAT SITES

Habitat	**Weekly Mean PC HF (µg m^{-3})**	**Weekly Mean %age Critical Level**	**24 Hour Mean PC HF (µg m^{-3})**	**24 Hour Mean %age Critical Level**
H1 Dorset Heaths SAC/SPA/Ramsar	0.012	2.4%	0.037	0.7%
H2 Poole Harbour SPA/Ramsar	0.0027	0.5%	0.0070	0.1%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.0014	0.3%	0.0036	0.1%
H4 Canford Heath SSSI	0.0049	1.0%	0.0180	0.4%
H5 Turbary & Kinson Commons SSSI	0.0033	0.7%	0.0088	0.2%
H6 Hurn Common SSSI	0.0017	0.3%	0.0034	0.1%

TABLE 2.10 MAXIMUM PREDICTED AIRBORNE HF CONCENTRATIONS AT HABITAT SITES

Habitat	Weekly Mean PC HF (µg m^{-3})	Weekly Mean %age Critical Level	24 Hour Mean PC HF (µg m^{-3})	24 Hour Mean %age Critical Level
H7 Slop Bog & Uddens Heath SSSI	0.0016	0.3%	0.0059	0.1%
H8 Parley Common SSSI	0.0025	0.5%	0.0053	0.1%
H9 Luscombe Valley SSSI	0.0011	0.2%	0.0033	0.1%
H10 Bourne Valley SSSI	0.0026	0.5%	0.0086	0.2%
H11 Holt & West Moors Heath SSSI	0.0011	0.2%	0.0039	0.1%
H12 Corfe & Barrow Hills SSSI	0.0027	0.5%	0.0103	0.2%
H13 Arne SSSI	0.0015	0.3%	0.0036	0.1%
H14 Moors River System SSSI	0.0020	0.4%	0.0042	0.1%
H15 Knighton Heath GC SNCI	0.0045	0.9%	0.0131	0.3%
H16 Alderney Waterworks SNCI	0.0029	0.6%	0.0110	0.2%
H17 Haymoor Bottom SNCI	0.0041	0.8%	0.0113	0.2%
H18 Arrowsmith Coppice SNCI/AW	0.0043	0.9%	0.0185	0.4%
H19 Delph Woods SNCI	0.0036	0.7%	0.0157	0.3%
H20 Dunyeats Hill HRS	0.0070	1.4%	0.0170	0.3%
H21 Moortown Copse SNCI	0.0109	2.2%	0.0213	0.4%
H22 Canford Park SANG LCNR	0.0046	0.9%	0.0135	0.3%
H23 Bearwood SNCI	0.0071	1.4%	0.0194	0.4%
H24 Frogmoor Wood SNCI	0.0006	0.1%	0.0037	0.1%
Critical Level	*0.5*		*5*	

2.3.3 Acidification

Deposition of sulphur and nitrogen compounds (from NO_x and NH_3 emissions) cause acidification and have been taken into account in assessing the acidification impacts of the EfW CHP Facility emissions on habitat sites. The critical load for acidification is defined by three quantities CLmaxS, CLmaxN and CLminN. The critical load function tool provided by APIS has been used to assess the likelihood of exceedance of the critical load based on the nitrogen and sulphur PCs and PECs. For HCl, the acidification is assigned to sulphur. A summary of the predicted PCs is provided in *Table 2.11* and the predicted exceedance and deposition as a proportion of the critical load function is provided in *Table 2.12*.

TABLE 2.11 MAXIMUM PREDICTED SULPHUR AND NITROGEN PCS FOR ACIDIFICATION IMPACTS

Habitat	PC N (keq $ha^{-1}a^{-1}$)	PC S (keq $ha^{-1}a^{-1}$)
H1 Dorset Heaths SAC/SPA/Ramsar		
Coniferous woodland	0.0059	0.015
Bog, dwarf shrub heath, acid grassland	0.0035	0.0069
H2 Poole Harbour SPA/Ramsar	0.0012	0.0023
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.0007	0.0014
H4 Canford Heath SSSI	0.0019	0.0069
H5 Turbary & Kinson Commons SSSI	0.0022	0.0044
H6 Hurn Common SSSI	0.0015	0.0029
H7 Slop Bog & Uddens Heath SSSI	0.0011	0.0022
H8 Parley Common SSSI Heathland	0.0020	0.0041
Woodland	0.0035	0.0088
H9 Luscombe Valley SSSI	0.0007	0.0014
H10 Bourne Valley SSSI	0.0015	0.0029
H11 Holt & West Moors Heath SSSI	0.0010	0.0020
H12 Corfe & Barrow Hills SSSI	0.0011	0.0022
H13 Arne SSSI	0.0007	0.0014
H14 Moors River System SSSI	0.0027	0.0032
H15 Knighton Heath GC SNCI	0.0029	0.0058
H16 Alderney Waterworks SNCI	0.0017	0.0033
H17 Haymoor Bottom SNCI	0.0020	0.0040
H18 Arrowsmith Coppice SNCI/AW	0.0019	0.0039
H19 Delph Woods SNCI	0.0029	0.0073
H20 Dunyeats Hill HRS	0.0019	0.0038
H21 Moortown Copse SNCI	0.0093	0.023
H22 Canford Park SANG LCNR	0.0034	0.0068
H23 Bearwood SNCI	0.0085	0.022
H24 Frogmoor Wood SNCI	0.0001	0.0003

TABLE 2.12 PREDICTED EXCEEDANCE AND DEPOSITION AS A PROPORTION OF THE CRITICAL LOAD FUNCTION – ACIDIFICATION

Habitat	PC	Background	PEC
H1 Dorset Heaths SAC/SPA/Ramsar			
Bog	1.9%	179%	181%
Dwarf shrub heath	1.5%	142%	143%
Acid grassland	1.9%	178%	180%
Coniferous woodland	2.4%	202%	205%
H2 Poole Harbour SPA/Ramsar	0.1%	20%	20%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.4%	157%	158%
H4 Canford Heath SSSI	1.0%	177%	178%
H5 Turbary & Kinson Commons SSSI	1.2%	170%	171%
H6 Hurn Common SSSI	0.5%	104%	105%
H7 Slop Bog & Uddens Heath SSSI	0.6%	165%	166%
H8 Parley Common SSSI Heathland	1.0%	164%	165%
Woodland	1.1%	151%	152%
H9 Luscombe Valley SSSI	0.4%	154%	154%
H10 Bourne Valley SSSI	0.8%	164%	165%
H11 Holt & West Moors Heath SSSI	0.5%	174%	174%
H12 Corfe & Barrow Hills SSSI	0.6%	182%	182%
H13 Arne SSSI	0.4%	153%	154%
H14 Moors River System SSSI	0.5%	170%	170%
H15 Knighton Heath GC SNCI	1.2%	141%	142%
H16 Alderney Waterworks SNCI	0.8%	164%	165%
H17 Haymoor Bottom SNCI	0.7%	110%	111%
H18 Arrowsmith Coppice SNCI/AW	0.7%	116%	116%
H19 Delph Woods SNCI	0.9%	160%	161%
H20 Dunyeats Hill HRS	0.6%	116%	116%
H21 Moortown Copse SNCI	1.8%	101%	103%
H22 Canford Park SANG LCNR	0.2%	20%	20%
H23 Bearwood SNCI	0.3%	20%	20%
H24 Frogmoor Wood SNCI	0.0%	158%	158%

For all habitat sites, the background deposition flux exceeds the relevant critical load except at Poole Harbour SPA/Ramsar, Canford Park SANG and Bearwood SNCI. At the European sites and the SSSIs, the maximum PC acid deposition rates arising from the EfW CHP Facility exceed 1% of the critical load at Dorset Heaths SAC/SPA/Ramsar, Canford Heath SSSI, Turbary & Kinson Commons SSSI and Parley Common SSSI. The predicted

concentration at the Dorset Heaths European site is the maximum predicted anywhere within the habitat site. Furthermore, Canford Heath SSSI, Turbary & Kinson Commons SSSI and Parley Common SSSI are co-located with the Dorset Heaths European site. The effect of these emissions on the integrity of these habitat sites is presented in the **Chapter 8 (Ecology and Nature Conservation)** of the **2026 ES Update**.

For the locally designated habitat sites, the PC is less than 100% of the respective critical load but exceeds 1% at Knighton Heath Golf Club SNCI and Moortown Copse SNCI.

2.3.4 Nutrient Nitrogen Deposition

Predicted nutrient nitrogen deposition rates arising from emissions of NO_x and NH_3 from the proposed EfW Facility are presented in *Table 2.13*. These are presented as a percentage of the relevant critical loads in *Table 2.14*.

TABLE 2.13 MAXIMUM PREDICTED NUTRIENT NITROGEN DEPOSITION AT HABITAT SITES (kg N $ha^{-1}a^{-1}$)

Habitat	PC	Back-ground	PEC	Lower Critical Load
H1 Dorset Heaths SAC/SPA/Ramsar				
Heathland habitats	0.049	12.69	12.74	5
Woodland habitats	0.083	23.0	23.08	10
H2 Poole Harbour SPA/Ramsar	0.016	12.60	12.62	5
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.017	21.29	21.31	5
H4 Canford Heath SSSI	0.026	12.96	12.99	5
H5 Turbary & Kinson Commons SSSI	0.031	12.42	12.45	5
H6 Hurn Common SSSI	0.021	12.11	12.13	5
H7 Slop Bog & Uddens Heath SSSI	0.016	12.92	12.94	5
H8 Parley Common SSSI	0.029	12.38	12.41	5
H9 Luscombe Valley SSSI	0.010	11.49	11.50	5
H10 Bourne Valley SSSI	0.021	12.42	12.44	5
H11 Holt & West Moors Heath SSSI	0.014	13.38	13.39	5
H12 Corfe & Barrow Hills SSSI	0.016	13.24	13.26	5
H13 Arne SSSI	0.010	11.64	11.65	5
H14 Moors River System SSSI	0.038	22.61	22.65	10
H15 Knighton Heath GC SNCI	0.041	12.74	12.78	5
H16 Alderney Waterworks SNCI	0.024	12.60	12.62	5
H17 Haymoor Bottom SNCI	0.028	12.60	12.63	5
H18 Arrowsmith Coppice SNCI/AW	0.027	13.02	13.05	5

TABLE 2.13 MAXIMUM PREDICTED NUTRIENT NITROGEN DEPOSITION AT HABITAT SITES (kg N $ha^{-1}a^{-1}$)

Habitat	PC	Back-ground	PEC	Lower Critical Load
H19 Delph Woods SNCI	0.040	23.66	23.70	10
H20 Dunyeats Hill HRS	0.027	13.02	13.05	5
H21 Moortown Copse SNCI	0.130	23.52	23.65	10
H22 Canford Park SANG LCNR	0.048	12.88	12.93	10
H23 Bearwood SNCI	0.119	23.10	23.22	10
H24 Frogmoor Wood SNCI	0.002	23.24	23.24	10

TABLE 2.14 MAXIMUM PREDICTED NUTRIENT NITROGEN DEPOSITION AS A PERCENTAGE OF THE RELEVANT CRITICAL LOAD

Habitat	PC	Background	PEC
H1 Dorset Heaths SAC/SPA/Ramsar			
Heathland habitats	1.0%	254%	255%
Woodland habitats	0.8%	230%	231%
H2 Poole Harbour SPA/Ramsar	0.3%	252%	252%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.3%	426%	426%
H4 Canford Heath SSSI	0.5%	259%	260%
H5 Turbary & Kinson Commons SSSI	0.6%	248%	249%
H6 Hurn Common SSSI	0.4%	242%	243%
H7 Slop Bog & Uddens Heath SSSI	0.3%	258%	259%
H8 Parley Common SSSI	0.6%	248%	248%
H9 Luscombe Valley SSSI	0.2%	230%	230%
H10 Bourne Valley SSSI	0.4%	248%	249%
H11 Holt & West Moors Heath SSSI	0.3%	268%	268%
H12 Corfe & Barrow Hills SSSI	0.3%	265%	265%
H13 Arne SSSI	0.2%	233%	233%
H14 Moors River System SSSI	0.4%	226%	226%
H15 Knighton Heath GC SNCI	0.8%	255%	256%
H16 Alderney Waterworks SNCI	0.5%	252%	252%
H17 Haymoor Bottom SNCI	0.6%	252%	253%
H18 Arrowsmith Coppice SNCI/AW	0.5%	260%	261%
H19 Delph Woods SNCI	0.4%	237%	237%
H20 Dunyeats Hill HRS	0.5%	260%	261%
H21 Moortown Copse SNCI	1.3%	235%	236%
H22 Canford Park SANG LCNR	0.5%	129%	129%

TABLE 2.14 MAXIMUM PREDICTED NUTRIENT NITROGEN DEPOSITION AS A PERCENTAGE OF THE RELEVANT CRITICAL LOAD

Habitat	PC	Background	PEC
H23 Bearwood SNCI	1.2%	231%	232%
H24 Frogmoor Wood SNCI	0.0%	232%	232%

The maximum PC nutrient nitrogen deposition rates arising from the EfW CHP Facility are low in comparison to the critical loads and the background deposition rates and the PCs are 1% or less of the lowest critical load for all European sites and SSSIs and less than 100% for LWS. Therefore, it is considered that the impact of nutrient nitrogen deposition on surrounding habitats is 'not significant'.

3 CUMULATIVE IMPACTS ON HABITAT SITES

3.1 INTRODUCTION

The impact of the combined emissions of NO_x, SO_2, NH_3, HF and HCl from the EfW CHP Facility, the emergency diesel generator (EDG) and the two off-site developments (ESS and Whittle Power) is provided. The effect on the integrity of the habitats present for these combined emissions on habitat sites is presented in the **Chapter 8 (Ecology and Nature Conservation)** of the **2026 ES Update**.

The impact at all habitat sites is provided. However, it should be noted that the maximum predicted at receptors H2 to H23 are representative of the discrete receptor locations (refer *Figure 3.2*). Where these form component parts of the Dorset Heaths SAC/SPA/Ramsar they may not represent the maximum predicted impact within that component part. However, the predicted impact at H1 (Dorset Heaths SAC/SPA/Ramsar) is the maximum predicted anywhere within the European habitat site. In addition, the impact for each development will occur at different locations and the sum of each contribution to H1 does not equal the maximum predicted at H1 for all sources.

3.2 AIRBORNE CONCENTRATIONS OF NO_x, SO_2, NH_3 AND HF

3.2.1 NO_x

Predicted maximum concentrations of NO_x, SO_2 and NH_3 as a percentage of the most stringent critical level are presented in *Tables 3.1* to *3.4*, respectively.

TABLE 3.1 MAXIMUM PREDICTED ANNUAL MEAN NO_x CONCENTRATIONS AS A PERCENTAGE OF THE CRITICAL LEVEL – CUMULATIVE IMPACT

Habitat	All Sources	EfW CHP and EDG	ESS	WH
H1 Dorset Heaths SAC/SPA/Ramsar	2.3%	0.5%	1.0%	2.1%
H2 Poole Harbour SPA/Ramsar	0.2%	0.2%	0.0%	0.1%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.1%	0.1%	0.0%	0.0%
H4 Canford Heath SSSI	0.4%	0.3%	0.0%	0.1%
H5 Turbary & Kinson Commons SSSI	0.5%	0.3%	0.0%	0.2%
H6 Hurn Common SSSI	0.7%	0.2%	0.3%	0.2%
H7 Slop Bog & Uddens Heath SSSI	1.8%	0.1%	0.0%	1.7%
H8 Parley Common SSSI	0.6%	0.3%	0.1%	0.2%
H9 Luscombe Valley SSSI	0.2%	0.1%	0.0%	0.1%
H10 Bourne Valley SSSI	0.3%	0.2%	0.0%	0.1%

TABLE 3.1 MAXIMUM PREDICTED ANNUAL MEAN NO_x CONCENTRATIONS AS A PERCENTAGE OF THE CRITICAL LEVEL – CUMULATIVE IMPACT

Habitat	All Sources	EfW CHP and EDG	ESS	WH
H11 Holt & West Moors Heath SSSI	0.4%	0.1%	0.0%	0.2%
H12 Corfe & Barrow Hills SSSI	0.3%	0.1%	0.0%	0.1%
H13 Arne SSSI	0.1%	0.1%	0.0%	0.0%
H14 Moors River System SSSI	0.6%	0.2%	0.2%	0.2%
H15 Knighton Heath GC SNCI	0.5%	0.4%	0.0%	0.1%
H16 Alderney Waterworks SNCI	0.4%	0.2%	0.0%	0.1%
H17 Haymoor Bottom SNCI	0.4%	0.3%	0.0%	0.1%
H18 Arrowsmith Coppice SNCI/AW	0.4%	0.3%	0.0%	0.1%
H19 Delph Woods SNCI	0.3%	0.2%	0.0%	0.1%
H20 Dunyeats Hill HRS	0.4%	0.3%	0.0%	0.1%
H21 Moortown Copse SNCI	0.9%	0.7%	0.0%	0.2%
H22 Canford Park SANG LCNR	0.6%	0.5%	0.0%	0.2%
H23 Bearwood SNCI	0.9%	0.7%	0.0%	0.2%
H24 Frogmoor Wood SNCI	0.6%	0.4%	0.0%	0.1%
Critical Level	*30*			

Highest annual mean NO_x concentrations at the Dorset Heaths European site occur as a result of emissions from the Whittle Power facility and are 2.1% of the critical level. The location of maximum impact occurs at the Slop Bog & Uddens Heath SSSI. Combined, the maximum impact from all sources is 2.3% of the critical level of which the EfW CHP and EDG together only contribute 0.1%. Combined with the EDG, the EfW CHP facility contributes at most 0.5% to the critical level at the Dorset Heaths European site.

Predicted concentrations as the 24-hour mean are presented in *Table 3.2*. For the EDG, it is assumed that this would operate for 3 hours per day every day. Furthermore, it is assumed that the EfW CHP Facility operates at the same time as the EDG. Therefore, results presented represent an extreme worst-case scenario.

TABLE 3.2 MAXIMUM PREDICTED 24-HOUR MEAN NO_x CONCENTRATIONS AS A PERCENTAGE OF THE CRITICAL LEVEL

Habitat	All Sources	EfW CHP and EDG	ESS	WH
H1 Dorset Heaths SAC/SPA/Ramsar	25.6%	25.5%	3.4%	9.9%
H2 Poole Harbour SPA/Ramsar	1.4%	1.3%	0.1%	0.4%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.7%	0.6%	0.1%	0.2%

TABLE 3.2 MAXIMUM PREDICTED 24-HOUR MEAN NO_x CONCENTRATIONS AS A PERCENTAGE OF THE CRITICAL LEVEL

Habitat	All Sources	EfW CHP and EDG	ESS	WH
H4 Canford Heath SSSI	4.7%	4.6%	0.1%	0.8%
H5 Turbary & Kinson Commons SSSI	1.5%	1.5%	0.2%	0.8%
H6 Hurn Common SSSI	1.7%	0.6%	1.7%	1.0%
H7 Slop Bog & Uddens Heath SSSI	8.4%	1.0%	0.1%	7.4%
H8 Parley Common SSSI	1.0%	0.9%	0.8%	0.9%
H9 Luscombe Valley SSSI	0.9%	0.6%	0.1%	0.4%
H10 Bourne Valley SSSI	1.5%	1.5%	0.1%	0.6%
H11 Holt & West Moors Heath SSSI	1.2%	0.7%	0.1%	1.2%
H12 Corfe & Barrow Hills SSSI	1.8%	1.7%	0.1%	0.6%
H13 Arne SSSI	0.7%	0.6%	0.1%	0.3%
H14 Moors River System SSSI	1.1%	0.7%	0.7%	1.0%
H15 Knighton Heath GC SNCI	2.9%	2.9%	0.1%	1.0%
H16 Alderney Waterworks SNCI	2.0%	2.0%	0.1%	0.7%
H17 Haymoor Bottom SNCI	2.1%	2.0%	0.1%	0.7%
H18 Arrowsmith Coppice SNCI/AW	3.4%	3.3%	0.1%	0.9%
H19 Delph Woods SNCI	2.6%	2.3%	0.1%	0.7%
H20 Dunyeats Hill HRS	3.0%	3.0%	0.1%	0.8%
H21 Moortown Copse SNCI	3.9%	3.8%	0.1%	1.0%
H22 Canford Park SANG LCNR	2.6%	2.6%	0.1%	1.1%
H23 Bearwood SNCI	3.3%	3.3%	0.2%	0.8%
H24 Frogmoor Wood SNCI	20.0%	20.0%	0.1%	0.7%
Critical Level	*75*			

Maximum predicted 24-hour mean NO_x concentrations are highest for the Facility but are mainly due to emissions from the EDG. This is assumed to operate for 3 hours per day to correspond with the worst-case meteorological conditions. Conditions requiring the use of the EDG for extended periods would be very rare and occur very infrequently. Therefore, it is concluded that the short-term critical level would not be exceeded.

3.2.2 SO_2

For sulphur dioxide, there are two critical levels (10 or 20 µg m^{-3}) depending on the presence of lichens. For screening purposes, the more stringent critical level of 10 µg m^{-3} has been adopted for all habitats. A comparison of predicted concentrations with this more stringent critical level is provided in *Table 3.3*.

Results are presented for the Facility and the ESS only as the Whittle Power facility does not have significant emissions of SO_2.

TABLE 3.3 MAXIMUM PREDICTED ANNUAL MEAN SO_2 CONCENTRATIONS AS A PERCENTAGE OF THE CRITICAL LEVEL

Habitat	All Sources	EfW CHP	ESS
H1 Dorset Heaths SAC/SPA/Ramsar	2.1%	0.3%	2.0%
H2 Poole Harbour SPA/Ramsar	0.1%	0.1%	0.0%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.1%	0.1%	0.0%
H4 Canford Heath SSSI	0.2%	0.2%	0.0%
H5 Turbary & Kinson Commons SSSI	0.3%	0.2%	0.1%
H6 Hurn Common SSSI	0.7%	0.1%	0.5%
H7 Slop Bog & Uddens Heath SSSI	0.1%	0.1%	0.0%
H8 Parley Common SSSI	0.4%	0.2%	0.2%
H9 Luscombe Valley SSSI	0.1%	0.1%	0.0%
H10 Bourne Valley SSSI	0.2%	0.1%	0.0%
H11 Holt & West Moors Heath SSSI	0.1%	0.1%	0.0%
H12 Corfe & Barrow Hills SSSI	0.1%	0.1%	0.0%
H13 Arne SSSI	0.1%	0.1%	0.0%
H14 Moors River System SSSI	0.5%	0.2%	0.4%
H15 Knighton Heath GC SNCI	0.3%	0.3%	0.0%
H16 Alderney Waterworks SNCI	0.2%	0.2%	0.0%
H17 Haymoor Bottom SNCI	0.2%	0.2%	0.0%
H18 Arrowsmith Coppice SNCI/AW	0.2%	0.2%	0.0%
H19 Delph Woods SNCI	0.2%	0.2%	0.0%
H20 Dunyeats Hill HRS	0.2%	0.2%	0.0%
H21 Moortown Copse SNCI	0.5%	0.5%	0.0%
H22 Canford Park SANG LCNR	0.4%	0.3%	0.0%
H23 Bearwood SNCI	0.5%	0.5%	0.1%
H24 Frogmoor Wood SNCI	0.0%	0.0%	0.0%
Critical Level	*10*		

The ESS contributes 2.0% of the most stringent critical level at the Dorset Heaths SAC which increases to 2.1% for combined emissions with the EfW CHP Facility. The maximum predicted concentration occurs within the Hurn Common SSSI component of the European site.

3.2.3 NH_3

For ammonia, there are also two critical levels depending on the presence of bryophytes and lichens. For screening purposes, the more stringent critical level of 1 µg m^{-3} has been adopted for all habitats. A comparison of predicted concentrations with this more stringent critical level is provided in *Table 3.4*. Results are presented for the Facility and the ESS only as the Whittle Power facility does not have significant emissions of NH_3.

TABLE 3.4 MAXIMUM PREDICTED ANNUAL MEAN NH_3 CONCENTRATIONS AS A PERCENTAGE OF THE CRITICAL LEVEL

Habitat	All Sources	EfW CHP	ESS
H1 Dorset Heaths SAC/SPA/Ramsar	1.6%	0.6%	1.3%
H2 Poole Harbour SPA/Ramsar	0.2%	0.2%	0.0%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.1%	0.1%	0.0%
H4 Canford Heath SSSI	0.2%	0.3%	0.0%
H5 Turbary & Kinson Commons SSSI	0.4%	0.4%	0.0%
H6 Hurn Common SSSI	0.6%	0.2%	0.4%
H7 Slop Bog & Uddens Heath SSSI	0.2%	0.2%	0.0%
H8 Parley Common SSSI	0.4%	0.3%	0.1%
H9 Luscombe Valley SSSI	0.1%	0.1%	0.0%
H10 Bourne Valley SSSI	0.3%	0.2%	0.0%
H11 Holt & West Moors Heath SSSI	0.2%	0.2%	0.0%
H12 Corfe & Barrow Hills SSSI	0.2%	0.2%	0.0%
H13 Arne SSSI	0.1%	0.1%	0.0%
H14 Moors River System SSSI	0.5%	0.3%	0.3%
H15 Knighton Heath GC SNCI	0.5%	0.5%	0.0%
H16 Alderney Waterworks SNCI	0.3%	0.3%	0.0%
H17 Haymoor Bottom SNCI	0.3%	0.3%	0.0%
H18 Arrowsmith Coppice SNCI/AW	0.3%	0.3%	0.0%
H19 Delph Woods SNCI	0.2%	0.3%	0.0%
H20 Dunyeats Hill HRS	0.3%	0.3%	0.0%
H21 Moortown Copse SNCI	0.8%	0.9%	0.0%
H22 Canford Park SANG LCNR	0.6%	0.6%	0.0%
H23 Bearwood SNCI	0.9%	0.8%	0.0%
H24 Frogmoor Wood SNCI	0.0%	0.0%	0.0%
Critical Level	*1*		

The ESS contributes 1.3% of the most stringent critical level at the Dorset Heaths SAC which increases to 1.6% for combined emissions with the EfW

CHP Facility. The maximum predicted concentration occurs within the Hurn Common SSSI component of the European site.

3.2.4 HF

At the Dorset Heaths European site, predicted weekly mean concentrations of HF for the combined emissions from the EfW CHP Facility and the ESS facility are 0.026 µg m^{-3} and would be 5.2% of the critical level of 0.5 µg m^{-3} and are potentially significant. However, with the inclusion of a background concentrations of 0.1 µg m^{-3}, the PEC would be 25% of the critical level and it is unlikely that this would be exceeded.

The predicted 24-hour mean HF concentrations are less than 10% of the 24-hour mean critical level at all habitat sites and would be assessed as not significant.

3.3 ACIDIFICATION

The combined contribution of the emission sources to acidification impacts is presented in *Table 3.5*. Predicted deposition rates exceed 1% of the respective critical loads at the Dorset Heaths European site and a number of the SSSIs. For the Dorset Heaths European site, the biggest contributor is the ESS facility.

TABLE 3.5 PREDICTED ACID DEPOSITION AS A PROPORTION OF THE CRITICAL LOAD – CUMULATIVE IMPACTS

Habitat	All Sources	EfW CHP and EDG	ESS	WH
H1 Dorset Heaths SAC/SPA/Ramsar				
Bog	9.0%	1.7%	7.6%	1.2%
Dwarf shrub heath	7.1%	1.4%	6.0%	0.9%
Acid grassland	9.0%	1.7%	7.6%	1.2%
Coniferous woodland	11.7%	2.2%	9.9%	1.5%
H2 Poole Harbour SPA/Ramsar	0.1%	0.1%	0.0%	0.0%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.5%	0.4%	0.1%	0.0%
H4 Canford Heath SSSI	0.9%	0.8%	0.1%	0.1%
H5 Turbary & Kinson Commons SSSI	1.4%	1.2%	0.2%	0.1%
H6 Hurn Common SSSI	1.8%	0.5%	1.3%	0.1%
H7 Slop Bog & Uddens Heath SSSI	1.5%	0.6%	0.1%	0.9%
H8 Parley Common SSSI Heathland	1.8%	1.1%	0.6%	0.1%
Woodland	1.8%	1.1%	0.6%	0.1%
H9 Luscombe Valley SSSI	0.5%	0.4%	0.1%	0.0%
H10 Bourne Valley SSSI	0.9%	0.8%	0.2%	0.1%
H11 Holt & West Moors Heath SSSI	0.7%	0.5%	0.1%	0.1%

H12 Corfe & Barrow Hills SSSI	0.7%	0.6%	0.1%	0.1%
H13 Arne SSSI	0.5%	0.4%	0.1%	0.0%
H14 Moors River System SSSI	1.3%	0.5%	0.8%	0.1%
H15 Knighton Heath GC SNCI	1.4%	1.3%	0.1%	0.1%
H16 Alderney Waterworks SNCI	1.0%	0.9%	0.2%	0.1%
H17 Haymoor Bottom SNCI	0.8%	0.7%	0.1%	0.0%
H18 Arrowsmith Coppice SNCI/AW	0.7%	0.5%	0.1%	0.0%
H19 Delph Woods SNCI	0.9%	0.7%	0.1%	0.1%
H20 Dunyeats Hill HRS	0.8%	0.7%	0.1%	0.0%
H21 Moortown Copse SNCI	1.8%	1.7%	0.1%	0.1%
H22 Canford Park SANG LCNR	0.2%	0.2%	0.0%	0.0%
H23 Bearwood SNCI	0.4%	0.3%	0.0%	0.0%
H24 Frogmoor Wood SNCI	0.5%	0.3%	0.1%	0.1%

3.4 NUTRIENT NITROGEN DEPOSITION

The combined contribution of the emission sources to nutrient nitrogen deposition is presented in *Table 3.6*. Predicted deposition rates exceed 1% of the respective critical loads at the Dorset Heaths European site, the Hurn Common SSSI and the Slop Bog & Uddens Heath SSSI. For the Dorset Heaths European site, the biggest contributors are the ESS and WH facilities.

TABLE 3.6 PREDICTED NUTRIENT NITROGEN DEPOSITION AS A PROPORTION OF THE CRITICAL LOAD – CUMULATIVE IMPACTS

Habitat	All Sources	EfW CHP and EDG	ESS	WH
H1 Dorset Heaths SAC/SPA/Ramsar				
Heathland habitats	3.6%	1.0%	2.3%	1.8%
Woodland habitats	3.2%	0.8%	1.9%	1.8%
H2 Poole Harbour SPA/Ramsar	0.4%	0.3%	0.0%	0.1%
H3 Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.5%	0.3%	0.0%	0.1%
H4 Canford Heath SSSI	0.6%	0.5%	0.0%	0.1%
H5 Turbary & Kinson Commons SSSI	0.8%	0.6%	0.1%	0.2%
H6 Hurn Common SSSI	1.2%	0.4%	0.6%	0.2%
H7 Slop Bog & Uddens Heath SSSI	1.8%	0.3%	0.0%	1.5%
H8 Parley Common SSSI	1.0%	0.6%	0.2%	0.2%
H9 Luscombe Valley SSSI	0.3%	0.2%	0.0%	0.1%
H10 Bourne Valley SSSI	0.6%	0.4%	0.1%	0.1%
H11 Holt & West Moors Heath SSSI	0.5%	0.3%	0.0%	0.2%

TABLE 3.6 PREDICTED NUTRIENT NITROGEN DEPOSITION AS A PROPORTION OF THE CRITICAL LOAD – CUMULATIVE IMPACTS

Habitat	All Sources	EfW CHP and EDG	ESS	WH
H12 Corfe & Barrow Hills SSSI	0.4%	0.3%	0.0%	0.1%
H13 Arne SSSI	0.3%	0.2%	0.0%	0.0%
H14 Moors River System SSSI	0.9%	0.4%	0.4%	0.2%
H15 Knighton Heath GC SNCI	1.0%	0.9%	0.0%	0.1%
H16 Alderney Waterworks SNCI	0.6%	0.5%	0.1%	0.1%
H17 Haymoor Bottom SNCI	0.7%	0.6%	0.0%	0.1%
H18 Arrowsmith Coppice SNCI/AW	0.6%	0.5%	0.0%	0.1%
H19 Delph Woods SNCI	0.5%	0.4%	0.0%	0.1%
H20 Dunyeats Hill HRS	0.7%	0.5%	0.0%	0.1%
H21 Moortown Copse SNCI	1.4%	1.3%	0.0%	0.2%
H22 Canford Park SANG LCNR	0.6%	0.5%	0.0%	0.1%
H23 Bearwood SNCI	1.4%	1.2%	0.1%	0.2%
H24 Frogmoor Wood SNCI	0.0%	0.4%	0.0%	0.1%

Gair Consulting Limited
Osterley
White Lackington
Piddletrenthide
Dorchester
DT2 7QU

Tel: 01869 278889