

**Natural Resources Wales permitting decisions**

**Kronospan Ltd  
Chirk Particleboard Factory**

**Decision Document**

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## Glossary of acronyms and definitions used in this document

AMP – Accident Management Plan

BAT – Best Available Technique(s)

BOD – biological oxygen demand

BAT-AEL – BAT Associated Emission Level

BRef – BAT Reference Note

CIRIA C736 – Containment systems for the prevention of pollution: Secondary, tertiary and other measures for industrial and commercial premises. 2014

CIP – Cleaning-in-place

COD – chemical oxygen demand

CRoW – Countryside and Rights of Way Act 2000

DAA – Directly associated activity

DAF – Dissolved Air Flotation

DD – Decision document

ELV – Emission limit value

EMS – Environmental Management System

EPR – Environmental Permitting (England and Wales) Regulations 2016

ETP – Effluent Treatment Plant

GWP – Global warming potential

HRA – Habitat Regulations Assessment

IBC – Intermediate Bulk Container

IED – Industrial Emissions Directive (2010/75/EU)

LNG – Liquefied Natural Gas

NRW – Natural Resources Wales

OPRA – Operator Performance Risk Appraisal

PAC – Polyaluminium chloride

PC – Process Contribution

PEC – Predicted Environmental Concentration

PFOA – perfluorooctanoic acid

PFOS – perfluorooctane sulfonate

PHW – Public Health Wales

PNEC – predicted no-effect concentration

PPS – Public Participation Statement  
PR – Public register  
RGN – Regulatory Guidance Note  
RGS – Regulatory Guidance Series  
SAC – Special Area of Conservation  
SGN – Sector Guidance Note  
SMNR – Sustainable Management of Natural Resources  
SPA – Special Protection Area  
SSSI – Site of Special Scientific Interest  
TGN – Technical Guidance Note  
TSS – total suspended solids  
WFD – Water Framework Directive  
RCF – Recycled Fibre

## 1. Our proposed decision

We have decided to issue the variation and consolidation for Chirk Particleboard Factory operated by Kronospan Limited. This will allow Kronospan Ltd to operate the Installation, subject to the conditions in the Permit.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the permit will ensure that a high level of protection is provided for the environment and human health.

The Variation Application is to operate an Installation which is subject principally to the Environmental Permitting Regulations 2016 ('EPR') and is subject to the requirements of the Industrial Emissions Directive ('IED').

The Permit contains many conditions taken from our Environmental Permit template conditions, including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these template conditions. Where they are included in the permit, we have considered the Application and accepted the details are sufficient and satisfactory to make the template condition appropriate. This document does, however, provide an explanation of our use of bespoke or installation-specific conditions.

## 2. Background to the Variation

Kronospan Limited operate a wood-based panels manufacturing facility at their site in Chirk. The activities carried out on site are described in the Introductory Note to the draft consolidated Permit.

Prior to this variation application, the operator held two environmental permits, one with Wrexham County Borough Council (WCBC) and one with Natural Resources Wales (NRW). The site has been subject to split environmental regulation under a Government Direction since 2003. However, in March 2018, Welsh Government issued a Direction requiring NRW to consolidate the existing NRW and WCBC environmental permits for the Installation into one and then subsequently conduct all regulatory functions in relation to that permit.

This variation consolidates all the activities previously regulated by WCBC into the NRW Permit, EPR/BW9999IG, which is the consolidated Permit for the Installation going forward. (The activities previously regulated by WCBC are described in the introductory note to the variation and consolidation notice EPR/BW9999IG/V008, which should be read in conjunction with this document). From the issue date of this Variation and Consolidation Notice, WCBC no longer regulates activities at the Installation and NRW regulates the entire site, through the consolidated Permit. At this point, the Installation is also no longer subject to a Ministerial Direction.

In addition to the NRW-led Permit consolidation, the Operator applied for some process changes as part of this variation application. These are various site developments resulting from investment in the site, that have been approved by planning permission since October 2014. The most notable of these are a new 45MW Chip Dryer and 50 metre Wet Electrostatic Precipitator (WESP 21).

We have assessed the predicted releases to air from the entire installation (including the Chip Dryer and WESP 21), to obtain a baseline for human health and ecological receptors, against which future regulatory improvements can be measured. The process changes have been incorporated into the Permit as part of this variation determination to ensure that it is up to date and represents all operations on site.

As part of the permit consolidation process, we have also conducted a full review of the conditions to ensure they reflect the requirements of the EPR, IED and the currently applicable Best Available Techniques (BAT) standards from the Production of Wood-based Panels BRef (BAT Conclusions issued in 2015).

Finally, this variation application originally contained a proposal for a new oriented strand board (OSB) production line which will now be considered at a later date and does not form part of this determination (see [Requests for Further Information](#) section below).

### **3. How we reached our draft decision**

#### **3.1 Receipt of Application**

The Application was duly made on 27th July 2018. This means we considered it was in the correct form and contained sufficient information for us to begin our determination, but not that it necessarily contained all the information we would need to complete that determination: see below.

Kronospan Limited claimed that certain information was commercially confidential and should be withheld from the public register. The claim was received on 28 November 2019 and accepted on 20 December 2019. The restriction on this information will be lifted on 20 December 2023. We have considered Kronospan's request and determined that we accept the claim for confidentiality. We consider that the inclusion of the relevant information on the public register would prejudice Kronospan's commercial interests to an unreasonable degree. The reasons for this are given in the notice of determination for the claim. The decision was taken in accordance with relevant legislation and process guidance on commercial confidentiality.

Apart from the issues and information described above, we have not received any other information in relation to the Application that appears to be confidential in relation to any party.

### 3.2 Consultation on the application

We carried out consultation on the Application in accordance with the Environment Permitting Regulations (EPR), Industrial Emissions Directive (IED), our statutory Public Participation Statement (PPS) and our Regulatory Guidance Note EPR RGN6 for “Determinations involving Sites of High Public Interest”.

We advertised the Application by a notice placed on our website, which contained all the information required by the EPR/IED, including advising people where and when they could see a copy of the Application. We also placed an advertisement in The Leader local newspaper on 5<sup>th</sup> September 2018. The public consultation started on 5<sup>th</sup> September 2018 and ended on 19<sup>th</sup> October 2018.

A copy of the Application and all other documents relevant to our determination (see below) are available for the public to view. Anyone wishing to see these documents could arrange for copies to be made.

We sent copies of the Application to the following bodies:

- Betsi Cadwaladr University Health Board
- Canal and River Trust
- Dŵr Cymru Welsh Water
- Food Standards Agency
- Health and Safety Executive
- North Wales Fire and Rescue Service
- Public Health Wales
- Wrexham County Borough Council (Environmental Protection Department)
- Wrexham County Borough Council (Planning Department)

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly. The consultation with the external organisations listed above started on 4<sup>th</sup> September 2018 and ended on 3<sup>rd</sup> October 2018.

In addition to our advertising the Application, we undertook additional public consultation in the form of a Public Drop In Event, which was held on 19<sup>th</sup> September 2018 at Chirk Parish Hall Council Chamber. A summary of consultation comments and our response to the representations we received can be found in Annex 1. We have taken all relevant representations into consideration in reaching our draft determination.

During our determination of this variation we also re-consulted with North Wales Fire and Rescue Service, Public Health Wales and Betsi Cadwaladr University Health Board on additional information submitted by the Operator since the original variation application was made in May 2018. Specifically, we re-consulted with NWFRS on an updated Fire Prevention and Mitigation Plan and Public Health Wales and Betsi Cadwaladr University Health Board on updated Air Quality Modelling for the installation. Our consideration of their responses is described in [Fire Prevention and Mitigation Plan](#) and the [Assessment of Health Effects from the Installation](#) sections below.

### **3.3 Requests for Further Information**

Although we were able to consider the Application duly made, we needed more information in order to determine it, and issued information notices on 23 November 2018, 8 April 2019, 23 July 2019, 5 February 2020, 8 October 2020 and 16 July 2021. A copy of each information notice and Kronospan's responses have been placed on our public register.

The information notice issued on 5 February 2020 was answered by Kronospan Ltd in part. Question 4 of this notice required a new background noise survey for the installation, as we considered that the 2016 survey data may not be representative of the background noise at the nearest sensitive receptors. The information requested was necessary to determine the magnitude of the predicted noise impact associated with the proposed Oriented Strand Board (OSB) development.

We agreed with the Operator that Question 4 of the notice could not be answered due to adverse weather conditions during February and early March 2020 and then the

Covid-19 pandemic which triggered a national lockdown on 23 March 2020. The consequence of this is that the site was not operating at its normal production capacity and during the national lockdown, background sound levels in the area were artificially low due to reduced traffic movements and other activity during this unprecedented time. Any survey conducted would therefore still have been considered as unrepresentative of normal site operations.

We are unable to complete our assessment of Kronospan's OSB application without this information, so we decided to progress the consolidation of the Wrexham County Borough Council and NRW permits separately to the OSB determination. As such, the proposed OSB development no longer forms part of this determination and is 'deemed withdrawn' for this variation (EPR/BW9999IG/V008) and will instead be considered as part of a future variation application.

In addition to our information notices, the status log of the draft consolidated permit provides a record of other information we received from Kronospan during our determination, often in response to follow up questions from NRW arising from our review of the Schedule 5 notice responses. We have made a copy of this information available to the public in the same way as the responses to our information notices.

Having carefully considered the Application and all other relevant information, we are now putting our draft decision before the public and other interested parties in the form of a draft Permit, together with this explanatory document. As a result of this stage in the process, the public has been provided with all the information that is relevant to our determination, including the original Application and additional information obtained subsequently, and we have given the public two separate opportunities (including this one) to comment on the Application and its determination. Once again, we will consider all relevant representations we receive in response to this final consultation and will amend this explanatory document as appropriate to explain how we have done this, when we publish our final decision.

Finally, we consulted on our draft decision from 16/06/2022 to 17/07/2022. A summary of the consultation responses and how we have taken into account all relevant representations is shown in Annex 1B.

## 4. The Legal Framework

The Permit Variation will be issued, if appropriate, under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. We address some of the specific legal requirements directly within the relevant sections of this document and have included an overview of the relevant legislation.

**The summary list of relevant legislation and regulations includes:**

- Pollution Prevention and Control (Exercise of Functions) (Wrexham County Borough Council) Direction 2003
- Environmental Permitting Regulations (Exercise of Functions) (Wrexham County Borough Council) Direction 2014
- Environmental Permitting Regulations (Exercise of Functions) (Wales) Direction 2018
- Environmental Permitting Regulations 2016 ('EPR')
- The Industrial Emissions Directive 2010 ('IED')
- Water Environment (Water Framework Directive) Regulations 2017
- The Habitats Directive 1992 ('HD')
- The Medium Combustion Plant Directive 2015 ("MCPD")
- The Energy Efficiency Directive 2012 ('EED')
- The Ambient Air Directive 2008 ('AAD')
- The Conservation of Habitats and Species Regulations 2010 ('Habs Regs')
- The Environment (Wales) Act 2016 ('EWA')
- The Human Rights Act 1998 ('HRA')
- The Countryside and Rights of Way Act 2000 ('CRoW')
- The Wildlife and Countryside Act 1981 ('WCA')
- The Well-being of Future Generations (Wales) Act 2015 ('WFG')
- The Natural Resources Body for Wales (Establishment) Order 2012
- The Natural Resources Body for Wales (Functions) Order 2013
- The Public Participation Directive 2003 (PPD)
- The Equalities Act 2010 ('EqA')

We consider that, if we issue the Permit Variation, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

#### 4.1 European Directives

All applicable European Directives have been considered in the determination of the application.

The European Union (Withdrawal) Act 2018 provides a constitutional framework for the continuity of “retained” EU law in the UK. Retained EU law is essentially a snapshot of EU law as it applied in the UK on 31/12/2020, which was effectively cut & pasted into our domestic legal system.

The applicability of the following European Directives has particular relevance to the combustion and biomass plant on site. We have therefore assessed their relevance to this particular variation as follows:

##### **Industrial Emissions Directive 2010/75/EU (IED) Chapter II Provisions for Activities listed in Annex I**

Chapter II of IED (including provisions requiring the use of Best Available Techniques (BAT) applies to the following activities listed in Table S1.1 of the consolidated permit: AR1 to AR7 inclusive.

Industrial Emissions Directive 2010/75/EU (IED), Chapter III Special Provisions for Combustion Plant.

Whilst the installation has significant combustion capacity, all combustion gases from Gas Engines 1 – 5, Gas Turbines 1 and 2, MDF 1 & 2 Dryers and Chip Dryer No. 4 are used for direct drying in the board production process and are therefore subject to Best Available Techniques (BAT) Reference document (BREF) for the Production of

Wood-based Panels, rather than by Chapter III of IED. Specifically, the wood-based panels BREF covers:

“on-site combustion plants (including engines) generating hot gases for directly heated dryers”.

This is underpinned by IED for combustion plants, Chapter III which states that this chapter will not apply to the following combustion plants:

“plants in which the products of combustion are used for the direct heating, drying or any other treatment of objects or materials”.

On this basis, we consider that Chapter III of IED will not apply to Gas Engines 1 to 5, Gas Turbines 1 and 2, MDF 1 & 2 Dryers and Chip Dryer No. 4.

Natural Gas boilers K1, K5 and K6 are not used for direct drying within the board production process. However they do not fall within the scope of Chapter III of IED because para 3, article 29 of IED states that “for the purpose of calculating the total rated thermal input of a combination of combustion plants ... individual combustion plants with a rated thermal input below 15MW shall not be considered”. K1 and K5 have rated thermal inputs of 2.25MW and 14.1MW respectively, so are outside the scope of IED Chapter III based on their individual sizes. K6 boiler has a thermal input of 16.5MW. However, we consider that it is still outside the scope of IED Chapter III, based on the fact that exhaust gases from the K6 boiler are released via a dedicated stack (emission point A18 on site plan in Schedule 7a of the consolidated Permit). No other combustion plant discharges to emission point A18, therefore the total rated thermal input of 16.5MW which discharges to this stack is less than 50MW, and K6 is therefore outside the scope of IED Chapter III as per Article 28 of IED.

K7 and K8 Biomass plants each have a dedicated stack and are used to supply steam and heat for MDF2 and MDF1 respectively. Each plant is below 50MW in size, so we consider that Chapter III of IED does not apply. In addition, combustion gases from the biomass plants are used in MDF 1 & 2 Dryers for direct drying purposes, which makes them exempt from Chapter III, IED.

## **Industrial Emissions Directive 2010/75/EU (IED), Chapter IV Special Provisions for Waste Incineration and Waste Co-incineration Plants.**

We consider that Chapter IV of IED applies to the K8 Biomass Boiler because Table S2.3 of the consolidated permit allows the acceptance of waste biomass that is not exempt from Chapter IV, specifically Waste code 19 12 07 which includes wood from waste management facilities and waste code 20 01 38 which includes municipal waste wood.

The K7 Biomass Boiler is only permitted to accept Chapter IV exempt waste biomass codes as per Table S2.2 of the consolidated permit and we have stipulated this requirement in the table, specifically:

“The waste wood biomass combusted in K7 is limited to waste types not subject to Chapter IV and Annex VI of the Industrial Emissions Directive (2010/75/EU)”

We are satisfied that sufficient operational controls are in place to ensure the segregation of waste types for the K7 and K8 Biomass Boilers prior to combustion, via Kronospan’s internal procedure KC/LOGY/PRO/0008 “Boiler Fuel Creation Procedure”. However the operation of K7 and K8 will be further reviewed as part of a forthcoming NRW-led permit variation to assess compliance with the Waste Incineration BREF.

In summary, the K8 Biomass boiler is subject to Chapter IV of IED, whilst K7 is subject to Chapter II of IED.

## **Medium Combustion Plant Directive (MCPD)**

The Medium Combustion Plant Directive (2015/2193/EU) (transposed into UK law by EPR 2016 – Schedule 25A), seeks to improve air quality by introducing emission limits for key pollutants and by bringing within regulatory control all medium combustion plant (MCP) in the 1-50MWth input range. The emission limit values apply from 20 December 2018 for new plants and by 2024 and 2029 for existing plants, depending on their size, fuel type, age and operating hours.

Whilst the installation has significant combustion capacity, combustion gases from Gas Engines 1 – 5, Gas Turbines 1 and 2, Biomass Boilers K7 and K8, MDF1 & 2 Dryers and Chip Dryer No.4 are used for direct drying in the board production process and are therefore regulated by the BREF for the Production of Wood-based Panels, rather than by MCPD. Specifically, the BREF note for the production of wood-based panels covers:

“on-site combustion plants (including engines) generating hot gases for directly heated dryers”.

This is underpinned by Article 2, paragraph 3(d) of MCPD which states that the directive shall not apply to:

“combustion plants in which the gaseous products of combustion are used for the direct heating, drying or any other treatment of objects or materials”

On this basis, we consider that MCPD will not apply to Gas Engines 1 to 5, Gas Turbines 1 and 2, Biomass Boilers K7 and K8, MDF1 & 2 Dryers and Chip Dryer No.4.

Natural Gas boilers K1, K5 and K6 are not used for direct drying within the board production process, so we consider that these will require regulation as existing plant under MCPD from 1<sup>st</sup> January 2025 for K5 and K6 (which each have a thermal rated input above 5MW) and from 1<sup>st</sup> January 2030 for K1 (which has a thermal rated input below 5MW).

However, we have applied MCPD emission limit values for oxides of nitrogen (NO and NO<sub>2</sub> expressed as NO<sub>2</sub>) (NO<sub>x</sub>) and NO<sub>x</sub> and carbon monoxide (CO) monitoring requirements as part of this variation (see [emission limit values](#) section).

### **Energy Efficiency Directive (EED)**

Articles 14 (5) – (8) of the Energy Efficiency Directive (2012/27/EU) applies to “thermal electricity generation installations” with a total thermal input of 20MW or more. The

objective of Articles 14(5)-(8) is to promote efficiency in heating and cooling through requirements on developers of these types of installations to consider the opportunities for developing as co-generation, recovering waste heat and supplying heat to district heating and cooling networks. Where cost effective opportunities exist, national authorities are required to authorise and grant permits only to installations developed as co-generation or using waste heat recovery.

In terms of the current variation application, natural gas boilers K1, K5 and K6 do not generate electricity and therefore cannot be considered to be part of a “thermal electricity generation installation”. As such we consider EED does not apply to K1, K5 and K6. K7 & K8 Biomass plants, MDF 1 & 2 Dryers and Chip Dryer No. 4 also do not generate electricity.

Gas Engines 1 to 5 do generate electricity, as do Gas Turbines 1 and 2. Of the gas engines, three are currently installed on the site, whilst a further two are due to be installed alongside the existing gas engines. We are satisfied that all of the waste heat and steam generated by the gas engines is utilised within the primary manufacturing process, with steam being used for MDF1 and MDF2 processes and the waste heat being used to directly dry product from the primary manufacturing process via MDF 1 and 2 dryers. On this basis, we are satisfied that there are no further opportunities that the operator could consider in terms of recovering waste heat and supplying heat to district heating and cooling networks. As such, a cost benefit analysis in this regard is not required.

The gas turbines are existing plant and are not being refurbished. As such, EED does not apply at this time. Furthermore, we are satisfied that the waste heat from the gas turbines is used for direct drying of product from the primary manufacturing process via MDF 1 and MDF2 dryers. As such, a cost benefit assessment would also not be required for the gas turbines, because we consider that there are no further opportunities that the operator could explore in terms of recovering waste heat and supplying heat to district heating and cooling networks.

## 5. The Installation

### 5.1 Description of the Installation and related issues

#### 5.1.1 The permitted activities

The extent and nature of the facilities taking place at the site required clarification. The decision on the facility was taken in accordance with EPR RGN 2 “Understanding the meaning of Regulated Facility”.

The regulated facility is an installation which comprises the following activities listed in Part 2 of Schedule 1 to the Environmental Permitting (England and Wales) Regulations 2016 (EPR):

- S1.1 A(1) (a) – burning any fuel in an appliance with a rated thermal input of 50 or more megawatts
- S4.1 A(1) (a) (ii) - producing organic chemicals containing oxygen
- S4.1A(1) (a) (viii) - producing organic chemicals such as polymers
- S5.1 A(1) (b) - The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour
- S6.1 A(2) (a) - Producing, in an industrial plant, one or more of the following wood-based panels with a production capacity exceeding 600m<sup>3</sup> per day: particleboard or fibreboard.
- S6.6 B (a) - Unless falling within Part A(2) of Section 6.1, manufacturing products wholly or mainly of wood at any works if the activity involves a relevant activity and the throughput of the works in any 12-month period is likely to be more than (i) 10,000 cubic metres in the case of works at which wood is only sawed, or wood is sawed and subjected to excluded activities, or (ii) 1,000 cubic meters in any other case.

together with the following Directly Associated Activities (DAAs):

- VITS Paper Impregnation Process
- Surface Water Lagoons 1 and 2
- Surface Water Lagoon 3

- Canal Water Treatment Plant
- Laminate (impregnated paper) facing
- Delivery and storage of raw materials to be used in the process
- Handling, processing and storage of all process wastes and by-products (including fuel and materials for composting)

Together, these listed and directly associated activities comprise the Installation.

The new 45 MW natural gas and wood dust fired Chip Dryer No. 4 (which has been added to the permit as a result of Kronospan's variation application), aggregates to form part of the existing S1.1 A(1) (a) combustion activity, based on the assumption of natural gas firing. The firing using wood dust from the process will be further examined as part of the forthcoming NRW-led review of the installation's K7 & K8 Biomass Boilers against the requirements of the BRef for Waste Incineration.

In addition, we have included new DAAs for the Laminate (impregnated paper) facing process, which is also known as "melamine facing" and Canal Water Treatment Plant respectively. These activities are not new to the site. The Laminate (impregnated paper) facing process is described in the Introductory Note to the WCBC permit. However, the existing process has recently been completely replaced with new equipment, so we consider it appropriate to be included as a DAA as part of this variation, in order to consolidate existing processes on site into a single updated NRW permit. The Canal Water Treatment Plant has been included as it is a process that is technically connected to the listed activities on site, primarily provision of boiler feed water for the combustion activities.

### 5.1.2 The site

The Kronospan site extends to around 40 hectares and comprises a number of large industrial process buildings housing the main manufacturing processes, storage areas for raw materials, warehouse buildings for manufactured products, together with other facilities associated with a discrete manufacturing process.

The western perimeter of the Kronospan site is formed by the Shrewsbury to Chester railway. The Shropshire Union Canal (Llangollen branch) is located to the west of the railway line. The eastern perimeter of the site is formed by Holyhead Road (B5070). A sewerage pumping station and one property, owned by Kronospan, are located to the immediate north of the site. To the immediate south of the site is the Mondelez factory and the Chirk recreational ground.

The main residential area of Chirk is located to the east of the site with residential properties lining the majority of the eastern side of Holyhead Road. Chirk town centre is located approximately 500m to the southeast of the site.

The wider area beyond the urban settlement of Chirk is dominated by agricultural fields and woodland. Chirk Castle and its grounds are located to the west of the site, beyond the canal.

There are several ecologically sensitive sites located within the relevant screening distances of the Installation, these screening distances are set out by our policies and guidance. The ecologically sensitive sites are listed and considered further in the section on **Biodiversity, Heritage, Landscape and Nature Conservation** below.

The European Sites are subject to the Habitats Regulations. We have assessed the impact of the Installation on all ecologically sensitive sites within the relevant screening distance according to the assessment criteria relevant to each type of designated site.

The location of the Installation is determined by planning consent, and the installation has been operating since the early 1970s. However it is material to our determination of the permit application to the extent that it has implications for the following matters:

- The impact of emissions on local communities and sensitive environmental receptors;
- The nature and scale of pollution prevention measures necessary to minimise the risk to the environment and human health, and;

- The extent to which the Installation is consistent with the objective of promoting the achievement of the principles of sustainable management of natural resources and contributing to the achievement of the well-being goals.

These matters are addressed in the relevant sections of this decision document.

The Applicant submitted a plan which we consider is satisfactory, showing the site of the Installation and its extent. A plan is included in Schedule 7a to the consolidated Permit, and the Operator is required to carry on the permitted activities within the installation boundary as shown in red on the plan. Emission points to air, water and sewer are labelled on the plan in Schedule 7a. An additional plan in Schedule 7b to the consolidated permit shows the location of all particulate filtration release points from bag filters and the MDF recycle cyclones.

### **5.1.3 Key Issues in the Determination**

The key issues arising during this determination were:

- Emissions to air and setting a regulatory baseline for the site;
- Ensuring use of Best Available Techniques compliant with Wood Panels BAT Conclusions;
- Fire Prevention and Mitigation Plan.

We therefore describe how we determined these issues in more detail in this document.

### **5.2 Site condition report**

Under Article 22(2) of the IED the Applicant is required to provide a baseline report containing at least the information set out in paragraphs (a) and (b) of the Article before starting operation.

The operator has provided an update to the site condition report submitted to the Environment Agency (now Natural Resources Wales) and WCBC in June 2004 as part of Kronospan Ltd's original Pollution Prevention and Control permit applications. The updated report considers all of the previous site investigations undertaken at the Facility since 2007 and considers the use, production and release of relevant hazardous substances, to demonstrate compliance with Article 22(2) of IED.

The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the installation and at cessation of activities at the installation.

As this application is for a permit variation and consolidation and the site condition report is updated rather than new, we will assess the report in conjunction with the Operator's response to Improvement Condition, NRW IC36. This IC requires Kronospan to submit a written plan for NRW's approval, to implement the new IED soil and groundwater monitoring requirements added as Permit Condition 3.2.4, demonstrating how the operator will meet the requirements of Articles 14(1)(b), 14(1)(e) and 16(2) of the IED.

#### Closure and decommissioning

Permit condition 1.1.1a requires the Operator to have a written Management System in place that identifies and minimises risks of pollution, including those arising from [site] closure. This is an existing permit condition, which pre-dates this particular variation application.

Prior to this permit consolidation, NRW's permit EPR/BW9999IG (formerly Environment Agency's) also required the operator to implement and maintain a Site Protection and Monitoring programme and to keep records of off-site environmental effects and matters which affect the condition of the land and groundwater until Permit Surrender. We also required prior notice of the implementation of any part of the site closure plan. The record keeping and notification requirement has been carried through into the consolidated permit, but the site protection and monitoring programme condition has been removed and replaced by condition 3.2.4 requiring periodic groundwater and soil sampling, as part of our update of the permit to the modern IED

compliant template. We are satisfied that the Operator has complied with these permit conditions since the original Pollution Prevention and Control Permit was granted in 2004 and that the consolidated permit conditions are essentially a continuation of what is already in place.

At the definitive cessation of activities, the Operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into account both the baseline conditions and the site's current or approved future use. To do this, the Operator will apply to us for surrender of the permit, which we will not grant unless and until we are satisfied that these requirements have been met.

The monitoring plan required by Improvement Condition NRW IC36, will set out how the Operator will monitor soil and groundwater going forward. The results from this testing will be used at permit surrender to assess the condition of the site against the baseline established prior to commencement of activities.

## **5.3 Operation of the Installation – general issues**

### **5.3.1 Administrative issues**

The Applicant is the sole Operator of the Installation.

We are satisfied that the Applicant is the person who will have control over the operation of the Installation after the issue of this variation; and that the Applicant will be able to operate the Installation so as to comply with the conditions included in the Permit. The decision was taken in accordance with EPR RGN 1 “Understanding the meaning of Operator”.

During the determination of this variation application, it became evident through the response to Schedule 5 notice #2 (received on 28<sup>th</sup> May 2019) that two additional distinct companies are present on site, as well as Kronospan Ltd (the Applicant). These companies are Kronospan Sawmilling Ltd and Kronoplus Ltd. In the Schedule 5 #2 response, the Applicant confirmed that these companies are the operator “for accounting purposes” of the sawmilling operation and the Kronoplus laminated flooring

line respectively (i.e. the two S6.6 B (a) activities in the draft permit). However, Kronospan is the “employing company” for all personnel at the installation, including the Directors of both Kronospan Sawmilling Ltd and Kronoplus Ltd.

Paragraph 2.2 of our guidance, EPR RGN 1 “Understanding the meaning of Operator” is clear that:

“Where different operators run different parts of what would otherwise be one facility (e.g. an installation), each part is therefore a regulated facility governed by a separate permit”.

This raised the possibility that the Chirk Particleboard Facility is a “multi-operator” installation. The effective consequence of this is that the overall site installation boundary would remain, however there would be 3 distinct EPR permits, one for each of the 3 Operators.

This was an important issue to resolve, in order to ensure:

- a) any legal notices that may be served by NRW are served on the correct operator; and
- b) the risk of a company being deemed to be operating without a permit is removed.

We therefore asked the Applicant (via email on 6 June 2019), to fully explain what is meant by an “employing company” and “operating company for accounting purposes” and provide definitive written evidence based on the operator control criteria set out in section 3.2 of EPR RGN 1 to enable us to determine the correct operators for the laminated flooring line and sawmill activities.

Kronospan Ltd responded via e-mail on 2 July 2019, attaching a letter from the Kronospan Group Secretary confirming the EPR RGN 1 criteria. Having reviewed the letter, we are satisfied that for the purposes of compliance with the Environmental Permitting (England and Wales) Regulations 2016, the Applicant (Kronospan Ltd) is the sole Operator of the Chirk Particleboard Factory Installation. This is based on the demonstration in the letter that Kronospan Ltd exercise the necessary control over

Kronospan Sawmilling Ltd and Kronoplus Ltd operations at the installation and the activities on site are largely integrated and co-ordinated by Kronospan Ltd.

More specifically, Kronospan is the employer for all personnel at the installation and all investment decisions have to be approved by Kronospan Ltd's finance function. Also, Kronospan Ltd is responsible for all on site computer systems and also runs the site wide purchasing function. The Kronospan Ltd. Environment, Health and Safety (EHS) department is responsible for the entire site's environmental management system (EMS) certification for ISO 14001, (which in turn comprises a single EMS). The suitable control of activities in an emergency also falls under the responsibility of the EHS department.

The letter has been incorporated into Table S1.2 "Operating Techniques" of the consolidated permit, so is enforceable.

### **5.3.2 Management**

The Applicant has an Environmental Management System (EMS) in place that is certified to ISO14001 (see response to BATC 1 in Annex 2 of this document). We are therefore satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the permit conditions.

### **5.3.3 Accident Management**

To ensure that the Operator's environmental management system sufficiently manages the residual risk of accidents, permit condition 1.1.1a requires that a written management system addresses the pollution risks associated with, amongst other things, accidents.

### **5.3.4 Fire Prevention and Mitigation Plan**

We have given particular focus to the Operator's Fire Prevention and Mitigation Plan (FPMP) as part of our assessment of this variation application. This is due to a

previous history of fires at the Installation and the fact that large amounts of combustible material in the form of biomass are stored at the site.

The Operator submitted a Fire Prevention and Mitigation Plan as part of the original variation application. We reviewed and consulted with North Wales Fire and Rescue Service on the plan as part of our original consultation and assessed the content of the FPMP against our guidance: “Fire Prevention and Mitigation Plan Guidance – Waste Management” (version 2.0, August 2017). Our assessment highlighted significant shortcomings with the FPMP across many of the topics address by our guidance. As such, we requested a fully updated plan, compliant with our guidance as part of the fifth Schedule 5 Notice we issued.

The updated FPMP has been placed on our online public register and is available for anyone to inspect. We re-assessed the updated plan against our guidance and sent the updated plan to North Wales Fire and Rescue Service for re-consultation on 21 December 2020. We included a list of targeted questions based upon outstanding items following our review of the updated plan for their consideration. The updated response from NWFRS was received on 11 April 2021 and is also available to view on our online public register.

Natural Resources Wales and NWFRS are in agreement about the improvements required on site and we have imposed the following improvement conditions:

- (i) NRW IC25 requires the operator to provide a copy of the procedure covering temperature monitoring of all stockpiles of combustible material stored on site.
- (ii) NRW IC26 requires a copy of the procedure covering the monitoring and recording of temperature within the biomass silos and the frequency of these checks.
- (iii) NRW IC30 requires the submission of procedures developed to minimise dust accumulation on hot surfaces (including high level areas not visible from the ground) and the frequency of high level inspections, plus corrective action recording.

- (iv) NRW IC31 requires the retention times for wood and biomass to be reviewed against our guidance and provide justification for where actual storage times are currently longer than stated in our guidance.
- (v) NRW IC32 requires the Operator to confirm the type of fire suppression system employed for all plant described in the updated FPMP and confirm if each suppression system is certified / accredited to a recognised standard.
- (vi) NRW IC33 requires the submission of a written procedure demonstrating how fire-fighting water is removed from the Middle Road Tertiary Containment area to prevent its storage capacity being exceeded.
- (vii) NRW IC34 requires more information on the management of water for fire-fighting and how appropriate volumes are maintained.
- (viii) NRW IC44 requires the Operator to work to reduce the maximum stockpile heights, widths and lengths of all combustible materials in line with our guidance.
- (ix) NRW IC45 requires a review of the separation distances between piles of stored combustible material to ensure these are stored with a suitable separation distance from other stockpiles, buildings, flammable materials and dangerous substances).
- (x) NRW IC46 requires the operator to ensure that fire walls used to separate piles of loose material are constructed and used in line with our guidance.
- (xi) NRW IC47 requires the Operator to review the location of the existing designated quarantine area for use in a fire against our guidance to ensure it is sized and used appropriately.
- (xii) NRW IC48 requires the Operator to submit an updated FPMP upon completion of the above improvement conditions for NRW's approval. Once approved, this will be incorporated into Table S1.2 of the permit as an operating technique and is therefore enforceable.

Permit condition 3.5.1 requires the Operator to operate the regulated activities in accordance with a written FPMP.

### **5.3.5 Off-site conditions**

We do not consider that any off-site conditions are necessary.

### 5.3.6 Operating techniques

We have specified that the Installation must be operated in accordance with the techniques set out in Table S1.2 of the consolidated Permit. The details referred to in that table describe the techniques that will be used for the operation of the Installation that have been assessed by Natural Resources Wales as BAT. They form part of the Permit through condition 2.3.1 and Table S1.2 in the Permit schedules and are therefore directly enforceable.

We have reviewed the techniques used by the operator and we have compared these with those techniques set out in the BAT Conclusions for the production of wood-based panels, published as Commission Implementing Decision (EU) 2015/2119 in the Official Journal of the EU on 20 November 2015. We have concluded that the operating techniques conform with the BAT Conclusions. See [Annex 2](#) of this document where the Operator's compliance status against the 28 BAT Conclusions is summarised.

The proposed techniques / emission levels for priorities for control are in line with the benchmark levels contained in the relevant sector guidance note and legislation. We therefore consider them to represent appropriate techniques for the facility.

We consider that the emission limits included in the permit reflect the BAT for the installation. (See [Emission Limits](#) section below).

The only exception to this is the K7 Biomass Boiler Emission Limit for releases of carbon monoxide (CO) to air. The Local Authority Process Guidance Note 1/03 (12) "Statutory Guidance for Boilers and Furnaces 20 – 50 MW thermal input" states that a CO limit of 150mg/m<sup>3</sup> should be taken as indicative of what is achievable. The emission limit we have set in the permit is therefore 150mg/m<sup>3</sup> for CO in line with the Local Authority Process Guidance Note 1/03 (12). This suggests that combustion in the K7 Biomass Boiler needs to be optimised and we have imposed improvement condition NRW IC37 requiring this. (See [Improvement Conditions](#) section below).

### 5.3.7 Permitted Waste Types

We have specified the permitted waste types, descriptions and where appropriate, quantities, which can be accepted at the Installation in Tables S2.2, S2.3 and S2.4 of the Permit. The three activities that are authorised to accept waste are K7 and K8 Biomass Boilers and Particleboard Manufacturing.

The wastes are all categorised as non-hazardous and are capable of being safely co-incinerated in K7 and K8 Biomass Boilers.

#### Waste Types for K7 Biomass Boiler

K7 Biomass Boiler is not new plant as it was previously assessed and permitted as part of the WCBC permit. Table S2.2 of the consolidated permit allows the co-incineration of the same Waste Types as stated in the WCBC permit. The exception to this is waste code 19 12 07 as this type of waste wood can originate from waste management facilities, and could therefore be comprised of non-exempt biomass. We are satisfied that the waste wood permitted for co-incineration in the K7 Biomass Boiler is excluded from the provisions of Chapter IV of IED.

#### Waste Types for K8 Biomass Boiler

K8 Biomass Boiler is not new plant as it was previously assessed and permitted as part of the WCBC permit. Table S2.3 of the consolidated permit allows the co-incineration of the same Waste Types as stated in the WCBC permit. We have also added an additional waste code, 20 01 38 at the request of the Operator which allows non-hazardous municipal wood waste to be co-incinerated. We have excluded waste code 20 03 03 as applied for by the Operator, as it relates to solid residues from skimming of surface water run-off from internal roadways. This has been excluded due to its likely high water content and also the fact that it was not previously permitted by WCBC's permit.

The annual quantity of wood waste to be co-incinerated in K8 Biomass Boiler shall continue to not exceed 100,000 tonnes at 35% moisture content. The operation of K8 Biomass Boiler is subject to the provisions of Chapter IV of IED.

### Waste Types for Particleboard Manufacture

The waste types permitted to be used for Particle Board Manufacturing are listed in Table S2.4 of the Permit and are based on the waste codes applied for by the Operator. We have excluded waste code 19 05 03, described as off-specification compost, as this technically originates from the treatment of anaerobic waste.

The Operator's variation application states that 325,000 tonnes of waste derived biomass are received at the Installation per year. We have imposed improvement condition NRW IC28 to determine the tonnages used in K7 Biomass Boiler and Particleboard Manufacturing relative to the 100,000 tonnes permitted for acceptance by K8 Biomass Boiler. The moisture content range required for use in each of the three processes shall also be provided as part of NRW IC28.

As K7 and K8 Biomass Boilers have already been assessed and permitted as part of the WCBC permit prior to this variation, we have not re-assessed compliance with BAT for these co-incineration activities, as this would have already been confirmed at the time they were permitted. However, once our consolidated permit is issued and NRW is the single environmental regulator for the site, we will be assessing the operation of both these plants, as well as the combustion of process dust in Chip Dryer No. 4 as part of our review of the permit against the BAT Conclusions for Waste Incineration published on 3 December 2019. Any improvements required to meet the updated BAT set out within the BAT Conclusions will need to be implemented by 2 December 2023.

We are satisfied that appropriate waste acceptance procedures are in place to ensure that only recycled wood is accepted that conforms to KC/PURC/DOC/0008 which is the official Kronospan specification for supplied RCF. Specifically, KC/LOGY/DOC/0008 "Suppliers Specification for RCF to Kronospan Chirk" specifies the measures in place to check that RCF entering the site conforms to the specification and ensures its rejection if not. KC/LOGY/WI/0001 sets out the moisture testing procedure for incoming wood residue deliveries and KC/LOGY/WI/0006 sets out the procedure for sampling and quality testing of incoming RCF. Finally

KC/LOGY/PRO/0008 “Boiler Fuel Creation Procedure” sets out how the segregation and storage of wastes is achieved for K7 and K8 Biomass Boiler feedstock.

### **5.3.8 Permit Conditions on Energy Efficiency**

Permit condition 1.2.1 requires the operator to ensure appropriate measures are in place to ensure that energy is recovered and used efficiently. Opportunities for improvements must be reviewed at least every four years.

The Operator is required to report energy usage and energy generated under condition 4.2.2 and Schedule 4. The following parameters are required to be reported: electrical energy generated, electrical energy used on Installation, thermal energy produced (e.g. steam) and thermal energy used on Installation. Together with the total waste biomass / wood co-incinerated per year, this information will enable NRW to monitor energy recovery efficiency at the Installation.

In addition, the operator is required to report on annual electricity consumption per tonne of finished product and natural gas consumption per tonne of finished product. These measures will enable NRW to track the efficiency of energy used for manufacturing at the installation year on year.

There are no site-specific considerations that require the imposition of standards beyond indicative BAT, and so NRW accepts that the Applicant’s proposals regarding energy efficiency in Annex 2 represent BAT for this Installation.

### **5.3.9 Permit conditions on efficient use of raw materials**

Permit condition 1.3.1 requires the operator to ensure appropriate measures are in place to ensure that raw materials and water are used efficiently in the regulated activities. Opportunities for improvements must be reviewed at least every four years.

The Operator is required to report raw material usage under condition 4.2.2 and Schedule 4, including incoming water and all waste biomass / wood delivered to the Installation, (including waste which is subsequently rejected). We also require water use per tonne of finished product to be reported annually, to enable us to track the efficiency of water used for manufacturing at the Installation year on year.

The Operator is also required to report the amount of urea consumed by K8 Biomass Boiler per tonne of waste wood co-incinerated. This will enable NRW to assess whether there have been any changes in the efficiency of the air pollution control plant, and the operation of the Selective Non-Catalytic Reduction (SNCR) to abate NO<sub>x</sub>.

There are no site-specific considerations that require the imposition of standards beyond indicative BAT, and so NRW accepts that the Applicant's proposals regarding raw materials and water use in Annex 2 represent BAT for this Installation. However we have imposed improvement condition NRW IC42 which requires the Operator to conduct an updated BAT review of water use, in order to identify where potable water use and effluent flow can be minimised through optimising process controls and recycling.

We have not specified any limits and controls on the use of raw materials and fuels in Table S2.1 as a result of this variation.

#### **5.3.10 Permit Conditions on Avoidance, recovery or disposal with minimal environmental impact of wastes produced by the activities**

This requirement addresses wastes produced at the Installation and does not apply to the waste being accepted there for use in Particleboard manufacture and the K7 and K8 Biomass Plants. Permit condition 1.4.1 requires the operator to ensure appropriate measures are in place to ensure that the waste hierarchy referred to in Article 4 of the Waste Framework Directive (WFD) will be applied to the generation of waste and that any waste generated will be treated in accordance with this Article. Permit condition 1.4.1 also requires that waste from the Installation that cannot be recovered will be disposed of using a method that minimises any impact on the environment. Opportunities for improvements must be reviewed at least every four years.

NRW accepts that the Applicant's proposals regarding the management of waste in Annex 2 represent BAT for this Installation in terms of the wood panel production activities. Kronospan Ltd's waste management procedure was supplied in response to the first schedule 5 Notice and has been incorporated in Table S1.2 Operating Techniques, so is directly enforceable. We have imposed improvement condition NRW

IC35 requiring the Operator to carry out a review of their waste management systems and procedures to address previously identified deficiencies highlighted in a waste audit. The findings of this review shall be sent to NRW in writing together with a timetable to implement any necessary changes that are identified.

The Operator is required to report waste produced under condition 4.2.2 and Schedule 4, including discharge of settled surface water effluent from emission point W1 and ash residues produced by the K7 and K8 Biomass Boilers.

There are no changes to the ash monitoring and reporting requirements for K8 Biomass Boiler. However we have imposed the same ash monitoring requirements on K7 Biomass Boiler as a new requirement. The purpose of this is to ensure that production of bottom ash and air pollution control residues (APCR as fly ash) is minimised, by achieving a high degree of burnout of ash in the boiler, which results in a material that is both reduced in volume and chemical reactivity.

Condition 3.6.1 requires the monitoring of residue quality for K7 Biomass Boiler and associated Table S3.9 specifies limits for loss on ignition (LOI) of <5% in K7 bottom ash. Compliance with this limit will demonstrate that good combustion control and waste burnout is being achieved in the boiler and waste generation is being avoided where practicable. Table S3.9 also requires the Operator to carry out an ongoing programme of monitoring on the metals content in K7 Biomass Boiler Bottom Ash and APCR residues. This information will help to further inform our planned review of K7 Biomass Boiler against the Waste Incineration BAT Conclusions.

## 6. Environmental Risk Assessment

We have reviewed the operator's assessment of the environmental risk from the facility. The operator's risk assessment is satisfactory.

This section of the decision document deals primarily with the dispersion modelling of emissions to air from the combustion stacks (as described in the **Modelling Methodology and Scenarios Considered** section above) and its impact on local air quality. The Applicant has assessed the installation's potential emissions to air against the relevant air quality standards, and the potential impact upon human health.

## 6.1 Minimising the Installations environmental impact

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration; accidents, fugitive emissions to air and water; as well as point source releases to air, discharges to ground or groundwater, global warming potential and generation of waste and other environmental impacts. Consideration may also have to be given to the effect of emissions being subsequently deposited onto land (where there are ecological receptors). These factors are discussed in this document.

For this particular variation, the principal emissions we have considered are those to air. All process effluent generated by the regulated activities on site is sent to sewer in accordance with existing trade effluent consents granted by Dŵr Cymru Welsh Water. Surface water run-off from roof-tops, site roads and the log yard is managed on a batch-discharge basis through holding lagoons into the Afon Bradley via emission point W1. The latter has not been considered further because the existing discharge is already regulated by NRW permit EPR/BW9999IG and there are no changes with current releases to water associated with this variation.

The next sections of this document explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and what measures we are requiring to ensure an appropriately high level of protection.

### 6.1.1 Assessment Methodology

#### **Application of Environment Agency Guidance “Risk assessments for your Environmental Permit”**

NRW has adopted this guidance.

A methodology for risk assessment of point source emissions to air, which we use to assess the risk of applications we receive for permits, is set out in Environment Agency guidance 'Air emissions risk assessment for your environmental permit' and has the following steps:

- (i) Describe emissions and receptors
- (ii) Calculate process contributions
- (iii) Screen out insignificant emissions that do not warrant further investigation
- (iv) Decide if detailed air modelling is needed
- (v) Assess emissions against relevant standards
- (vi) Summarise the effects of emissions

The methodology uses a concept of “process contribution (PC)”, which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest.

The methodology provides a simple method of calculating PC primarily for screening purposes and for estimating process contributions where environmental consequences are relatively low. It is based on using dispersion factors.

These factors assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise and so the process contributions calculated are likely to be an overestimate of the actual maximum concentrations.

More accurate calculation of process contributions can be achieved by mathematical dispersion models, which consider relevant parameters of the release and surrounding conditions, including local meteorology – these techniques are expensive but normally lead to a lower prediction of PC.

### **6.1.2 Use of Air Dispersion Modelling**

For complex applications, we normally require the Applicant to submit a full air dispersion model as part of their application. Air dispersion modelling enables the process contribution to be predicted at any environmental receptor that might be impacted by the plant.

Once short-term and long-term PCs have been calculated in this way, they are compared with Environmental Standards (ES). ES are described in the Environment Agency (Gov.uk) web guide ‘Air emissions risk assessment for your environmental permit’.

The Environment Agency web guide sets out the relevant ES as:

- Ambient Air Directive Limit Values
- Ambient Air Directive and 4th Daughter Directive Target Values
- UK Air Quality Strategy Objectives
- Environmental Assessment Levels

Where an Ambient Air Directive (AAD) Limit Value exists, the relevant standard is the AAD Limit Value. Where an AAD Limit Value does not exist, AAD target values, UK Air Quality Strategy (AQS) Objectives or Environmental Assessment Levels (EALs) are used. The Environment Agency web guide sets out EALs which have been derived to provide a similar level of protection to Human Health and the Environment as the AAD limit values, AAD target and AQS objectives.

In a very small number of cases, e.g. for emissions of lead, the AQS objective is more stringent than the AAD value. AAD target values, AQS objectives and EALs do not have the same legal status as AAD limit values, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with them.

However, they are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

PCs are screened out as **Insignificant** if:

- the **long-term** process contribution is less than **1%** of the relevant ES; and
- the **short-term** process contribution is less than **10%** of the relevant ES.

The **long term** 1% process contribution insignificance threshold is based on the judgements that:

- It is unlikely that an emission at this level will make a significant contribution to air quality;
- The threshold provides a substantial safety margin to protect health and the environment.

The **short term** 10% process contribution insignificance threshold is based on the judgements that:

- spatial and temporal conditions mean that short term process contributions are transient and limited in comparison with long term process contributions;
- the threshold provides a substantial safety margin to protect health and the environment.

Where an emission is screened out in this way, we would normally consider that the Applicant's proposals for the prevention and control of the emission to be BAT. That is because if the impact of the emission is already insignificant, it follows that any further reduction in this emission will also be insignificant.

However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant.

For those pollutants which do not screen out as insignificant, we determine whether exceedances of the relevant ES are likely. This is done through detailed audit and review of the Applicant's air dispersion modelling taking background concentrations and modelling uncertainties into account.

Where an exceedance of an AAD limit value is identified, we may require the Applicant to go beyond what would normally be considered BAT for the Installation or we may refuse the application if the applicant is unable to provide suitable proposals.

Whether or not exceedances are considered likely, the application is subject to the requirement to operate in accordance with BAT. This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as SSSIs, SACs or SPAs). These additional factors may also lead us to include more stringent conditions than BAT.

If, as a result of reviewing the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions **would cause significant pollution**, we would refuse the Application.

## 6.2 Assessment of Impact on Air Quality

The Applicant's assessment of the impact of air quality is set out in the "Kronospan Dispersion Modelling Assessment" report by Fichtner Consulting Engineers Ltd (ref: S2376-0030-0003RSF, dated 15 December 2021). This part of our decision document should be read in conjunction with the Fichtner report. The assessment comprises:

- Dispersion modelling of emissions to air from the operation of the entire installation.
- A study of the impact of emissions on nearby sensitive receptors, including human receptors and habitat / conservation sites.

This section of the decision document deals primarily with the dispersion modelling of emissions to air from the entire installation and its impact on local air quality. The impact on conservation sites is considered elsewhere in this document.

The Applicant has assessed the Installation's current emissions to air against the relevant air quality standards, and the potential impact upon local conservation and habitat sites and human health. These assessments predict the potential effects on local air quality from the Installation's stack emissions using the ADMS 5.2 dispersion model, which is a commonly used computer model for regulatory dispersion modelling.

The model used 5 years of meteorological data collected from the weather station at RAF Shawbury between 2013 and 2017. RAF Shawbury is approximately 30km to the south-east of the installation and is the closest and most representative meteorological station available.

The effects of terrain on dispersion were identified as not significant and subsequent modelling was carried out without modelling the effects of terrain.

### 6.2.1 Air Dispersion Modelling Context

Point source releases to air from the installation originate from various items of combustion plant, process driers associated with the production lines, and dedicated stacks associated with the formaldehyde plant and paper impregnation lines. Bag filter plants operate in various areas on-site for the abatement of particulate emissions from the process. The main pollutants released to air are:

- oxides of nitrogen (NO<sub>x</sub>) and carbon monoxide (CO) from the natural gas fired combustion plant.
- NO<sub>x</sub>, CO, sulphur dioxide (SO<sub>2</sub>), particulate matter (PM), total organic carbon (TOC), hydrogen chloride (HCl), hydrogen fluoride (HF), cadmium (Cd) and Thallium (Tl) and their compounds, Mercury (Hg) and its compounds, metals: Antimony (Sb), Arsenic (As), Lead (Pb), chromium (Cr), Cobalt (Co), copper (Cu), Manganese (Mn), nickel (Ni), vanadium (V), and their compounds, Ammonia (NH<sub>3</sub>), nitrous oxide (N<sub>2</sub>O), dioxins and furans, dioxin-like PCBs, and

- poly-cyclic aromatic hydrocarbons (PAHs) from the two waste biomass fired co-incinerators (K7 and K8);
- (iii) formaldehyde, volatile organic compounds (VOC) and PM from process sources.

Exhaust gases from the combustion plant, process driers and co-incinerators are used for direct drying in the production process, so these gases are subject to dilution with process air, prior to release through 3 main release points on site, specifically MDF1 & 2 Cyclones and the new WESP 21.

### 6.2.2 Modelling Methodology and Scenarios Considered

The applicant used ADMS 5.2 to model predicted Process Contributions (PCs) from the overall Kronospan Factory. The assessment evaluates the highest predicted PC to ground level concentrations, which is the point of maximum impact. In addition, the predicted PC across the modelling domain has been analysed to determine the impact at the specific receptors identified. Background concentrations for the assessment have been derived from monitoring and national mapping as summarised in Table 19 of Fichtner's Dispersion Modelling report dated 15 December 2021 (report ref: S2376-0030-0003RSF). For short-term averaging periods (of less than 24-hours) the background concentration has been assumed to be twice the long-term ambient concentration following the Environment Agency's Air Emissions Guidance methodology.

As detailed, the exhaust gases from the combustion plant are used within the driers and exit to atmosphere via the cyclones. Each of these combustion plants has proposed Emission Limit Values (ELV) for NO<sub>x</sub>. The mass of NO<sub>x</sub> has been calculated assuming each item of combustion plant feeding the driers operates at the ELVs. The applicant states that this has shown that the mass of NO<sub>x</sub> released into the driers in this scenario is well above that monitored exiting the driers. Therefore, for this variation application, the following emissions scenarios have been considered:

- 1) Likely Case:** driers emitting NO<sub>x</sub> calculated from typical emissions, all other sources emitting at the relevant ELVs. This is the most realistic case.
- 2) Limits Case:** Driers emitting NO<sub>x</sub> at Wood Panels BRef BAT-AEL (emission benchmark), all other sources emitting at the relevant ELVs. This is indicative

of a worst-case scenario and is not based on actual monitoring data from the Driers, so is less realistic than the likely case.

The operating scenarios modelled are conservative as they assume all plant continually operates and does not consider periods of reduced operations on site or shutdowns. In addition, the modelling predictions under both the Likely and Limits cases are very conservative because of the following assumptions:

- 1. All items of plant run at peak capacity when operating.** (In reality, each item of plant is not continually operated at peak capacity as operations are dependent on production).
- 2. Emissions from all combustion plant are at the ELVs.** (The applicant states that monitoring of emissions from the existing combustion plant on-site show that these normally operate below the ELVs).
- 3. Operation of all items of plant occur during the worst-case weather conditions for dispersion.** (The applicant states that it is unlikely that the non-standard operations would occur at the same time as the adverse conditions for dispersion of emissions).
- 4. The predicted impacts are based on the maximum predicted concentration using 5 years of weather data.**

Also, because Kronospan is an existing site, some of the plant which has been included in the modelling, will also be included in the existing background concentrations at both human and ecological receptors, so an element of double counting will exist.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are reasonably precautionary. However, we have imposed NRW IC27 which requires the operator to provide a written report setting out the frequency and duration of both normal operations and the non-standard operations considered in the modelling. This will enable us to get an understanding of how often the different operating scenarios occur, which will further help to place the modelling results into context. The modelling is over precautionary in assuming that each occurs 100% of the time.

The Applicant has assessed data on background concentrations of pollutants from several available sources and has drawn information from Background Air Pollution maps published by Defra. This data is summarised in the Fichtner report and has been used by the Applicant to establish the background (or existing) air quality against which to measure the potential impact of the entire installation.

We consider that background values have been sourced from the most appropriate sources. Twice the long-term background values have been used as an estimate of short-term background in accordance with the Environment Agency web guidance.

As well as calculating the peak ground level concentration, the Applicant has modelled the concentration of key pollutants at a number of specified locations within the surrounding area.

The way in which the Applicant used dispersion models, its selection of input data, use of background data and the assumptions it made have been reviewed by Natural Resources Wales modelling specialists to establish the robustness of the Applicant's air impact assessment. The output from the model has then been used to inform further assessment of health impacts and impact on habitats and conservation sites.

The Applicant's modelling predictions are summarised in the following sections.

### **6.2.3 Consideration of key pollutants**

#### **(i) Nitrogen dioxide (NO<sub>2</sub>)**

We have only considered predicted releases for NO<sub>2</sub> emissions under the Likely Case scenario. This is because we have already had to impose the Likely Case ELV for the protection of surrounding habitats sites (as described in the Biodiversity, Landscape, Heritage and Nature Conservation section below). As the stricter Likely case ELV has been imposed in the permit, this will also benefit human health as well as ecological receptors.

The impact on air quality from NO<sub>2</sub> emissions has been assessed against the ES of 40 µg/m<sup>3</sup> as a long-term annual average and a short-term hourly average of 200 µg/m<sup>3</sup>. The model assumes a 70% NO<sub>x</sub> to NO<sub>2</sub> conversion for the long term and 35% for the short-term assessment in line with Environment Agency guidance on the use of air dispersion modelling.

The Fichtner Dispersion Modelling Assessment shows that the peak long-term PC is greater than 1% of the ES under the likely case for all operating scenarios modelled and therefore cannot be screened out as insignificant.

The maximum off-site long term Process Contribution (PC) under the Likely Case is modelled at 15.85 µg/m<sup>3</sup>. This is predicted to occur when K7 and K8 biomass plants are offline. (The applicant states that this scenario is not expected to occur for extended periods and not for a continuous 24-hour period). At 39.6% of the 40 µg/m<sup>3</sup> EUEQS, this is greater than 1% of the EUEQS H1 screening threshold and therefore cannot be screened out as insignificant. However, when existing NO<sub>2</sub> background concentrations are added to the annual mean PC to give the Predicted Environmental Concentration (PEC), the PEC is 66.7% of the annual EUEQS. As a comparison, the predicted maximum off-site long-term PC under normal operations (Likely Case) is modelled at 5.85 µg/m<sup>3</sup>, which equates to 14.6% of the AQAL, so also cannot be screened out as insignificant. The PEC is 41.7% under normal operations (Likely Case). As such, the annual average EUEQS is unlikely to be exceeded at any off-site location.

The maximum off-site predicted short-term PC (under the Likely Case when K7 and K8 biomass plants are offline) is modelled at 99.58 µg/m<sup>3</sup>. At 49.8% of the 200 µg/m<sup>3</sup> short term EQS, this is greater than the 10% short term screening threshold and therefore cannot be screened out as insignificant. NO<sub>2</sub> was modelled at less than 10% of the short term hourly average EQS of 200 µg/m<sup>3</sup>. This is below the threshold for short-term impact and therefore the effects at off-site locations are insignificant. However, when existing NO<sub>2</sub> background concentrations are added to the annual mean PC to give the Predicted Environmental Concentration (PEC), the PEC is 60.6% of the short term EUEQS. In comparison, the predicted maximum off-site short-term

PC under normal operations (Likely Case) is modelled at  $37.74 \mu\text{g}/\text{m}^3$ , which equates to 18.9% of the AQAL, so also cannot be screened out as insignificant. The PEC is 29.7% under normal operations (Likely Case). As such, the short term EUEQS is unlikely to be exceeded at any off-site location.

The peak short-term PC is above the level that would screen out as insignificant (>10% of the ES) under the likely case for all operating scenarios modelled. However it is not expected to result in the ES being exceeded in terms of the maximum PEC value on the modelling grid.

(ii) Particulate matter PM<sub>10</sub> and PM<sub>2.5</sub>

The impact on air quality from particulate emissions has been assessed against the ES for PM<sub>10</sub> (particles of 10 microns and smaller) and PM<sub>2.5</sub> (particles of 2.5 microns and smaller). For PM<sub>10</sub>, the ES are a long-term annual average of  $40 \mu\text{g}/\text{m}^3$  and a short-term daily average of  $50 \mu\text{g}/\text{m}^3$ . For PM<sub>2.5</sub> the ES of  $20 \mu\text{g}/\text{m}^3$  as a long-term annual average Limit Value from the Ambient Air Directive has been used.

The Applicant's predicted impact of the Installation against these ESs is presented in the Fichtner Dispersion Modelling Assessment, The assessment assumes that **all** particulate emissions are present as PM<sub>10</sub> for the PM<sub>10</sub> assessment and that **all** particulate emissions are present as PM<sub>2.5</sub> for the PM<sub>2.5</sub> assessment.

The above assessment is considered to represent a worst-case assessment in that: -

- It assumes that each item of plant (including all the dust units) emit particulates continuously at the ELVs / (manufacturer's guarantee for the dust units) whereas actual emissions can be expected to be lower, as the operational loading of each process is below 100% and each source operates below the ELV.

The maximum off-site long term PM<sub>10</sub> Process Contribution (PC) (occurring when MDF1 & MDF2 are offline) is modelled at  $14.64 \mu\text{g}/\text{m}^3$ . (The applicant states that this scenario would only occur for extremely short and rare periods as the electricity and

heat generated would not be able to be used by the manufacturing process). At 36.6% of the 40  $\mu\text{g}/\text{m}^3$  EUEQS, this is greater than 1% of the long-term screening threshold and therefore cannot be screened out as insignificant. However, when existing  $\text{PM}_{10}$  background concentrations are added to the annual mean PC to give the Predicted Environmental Concentration (PEC), the PEC is 75.1% of the annual EUEQS. As a comparison, the predicted maximum off-site long-term PC under normal operations is modelled at 14.31  $\mu\text{g}/\text{m}^3$ , which equates to 35.8% of the AQAL, so also cannot be screened out as insignificant. The PEC is 74.3% under normal operations. As such, the annual average EUEQS is unlikely to be exceeded at any off-site location.

The maximum off-site short term  $\text{PM}_{10}$  Process Contribution (PC) (occurring when MDF1 & MDF2 are offline) is modelled at 35.04  $\mu\text{g}/\text{m}^3$ . At 70.1% of the 50  $\mu\text{g}/\text{m}^3$  EUEQS, this is greater than 1% of the long-term screening threshold and therefore cannot be screened out as insignificant. However, when existing  $\text{PM}_{10}$  background concentrations are added to the short-term PC to give the Predicted Environmental Concentration (PEC), the PEC is 100.9% of the short term EUEQS. Under all other operating scenarios including normal operations, the PEC is predicted to be 100.7% of the short term AQAL. As such, the modelling predictions show that the short term AQAL for  $\text{PM}_{10}$  could be exceeded as the maximum predicted concentration on the modelling grid. However as explained above, the assessment is based very much on a worst-case scenario and in reality the PEC is expected to be below 100% of the ES. The Fichtner modelling report has identified 14 human receptor locations surrounding the installation and has presented predicted concentrations of  $\text{PM}_{10}$  at each of these locations, to reflect the fact that the maximum concentration predicted on the modelling grid does not coincide with the nearest sensitive human receptors.

The maximum predicted PC at the most impacted receptor is modelled at 15.0  $\mu\text{g}/\text{m}^3$ , which is 30% of the short-term ES under normal operations. When the background concentration is added to the PC, the PEC is 60.8% of the short-term ES. On this basis, we are satisfied that the short term  $\text{PM}_{10}$  ES is unlikely to be exceeded at any sensitive human receptor.

The maximum off-site long term  $\text{PM}_{2.5}$  Process Contribution (PC) (occurring when MDF1 & MDF2 are offline) is modelled at 14.64  $\mu\text{g}/\text{m}^3$ . (The applicant states that this

scenario would only occur for extremely short and rare periods as the electricity and heat generated would not be able to be used by the manufacturing process). At 73.2% of the 20  $\mu\text{g}/\text{m}^3$  ES, this is greater than 1% of the long-term screening threshold and therefore cannot be screened out as insignificant. When existing  $\text{PM}_{2.5}$  background concentrations are added to the annual mean PC to give the Predicted Environmental Concentration (PEC), the PEC is 127.9% of the annual EUEQS. As a comparison, the predicted maximum off-site long-term PC under normal operations is modelled at 14.31  $\mu\text{g}/\text{m}^3$ , which equates to 71.6% of the AQAL, so also cannot be screened out as insignificant. The PEC is 126.3% under normal operations. As such, the modelling predictions show that the long-term ES for  $\text{PM}_{2.5}$  could be exceeded as the maximum predicted concentration on the modelling grid. However as explained above, the assessment is based very much on a worst-case scenario and in reality the PEC is expected to be below 100% of the ES. The Fichtner modelling report has identified 14 human receptor locations surrounding the installation and has presented predicted concentrations of  $\text{PM}_{2.5}$  at each of these locations, to reflect the fact that the maximum concentration predicted on the modelling grid does not coincide with the nearest sensitive human receptors.

The maximum predicted PC at the most impacted receptor is modelled at 6.36  $\mu\text{g}/\text{m}^3$ , which is 31.8% of the long-term ES under normal operations. When the background concentration is added to the PC, the PEC is 86.5% of the long-term ES. On this basis, we are satisfied that the long term  $\text{PM}_{2.5}$  ES is unlikely to be exceeded at any sensitive human receptor.

(iii) Acid gases,  $\text{SO}_2$ , HCl and HF

The Fichtner report shows that emissions of HCl and HF can be screened out as insignificant under all operating scenarios, in that the process contribution is <10% of the short-term ES. There is no long-term ES for HCl. HF has 2 assessment criteria – a 1-hr ES and a monthly EAL – the process contribution is <1% of the monthly EAL and so the emission screens out as insignificant if the monthly ES is interpreted as representing a long-term ES.

There is no long term EAL for SO<sub>2</sub> for the protection of human health. Protection of ecological receptors from SO<sub>2</sub> for which there is a long-term ES is considered in the **Biodiversity, Heritage, Landscape and Nature Conservation** section below.

Emissions of SO<sub>2</sub> can be screened out as insignificant in that the short-term process contribution is also <10% of each of the three short term ES values under normal operations and when MDF1 is Offline.

However, not all the PC screen out as insignificant in operating scenarios where MDF2 is Offline and both MDF1 & 2 are Offline. Specifically, when MDF2 is offline, the PC for the daily mean ES is modelled at 10.2% of the standard and the 15-minute mean PC is modelled at 13.9% of the standard. Although, when background levels of SO<sub>2</sub> are added to the predicted PCs to get the overall predicted environmental concentration, the PEC for the daily and 15-minute means are 15.6% and 16.5% of the ESs respectively. For MDF1 & 2 Offline, the predicted PCs for the daily, hourly and 15-minute mean are modelled at 22.6%, 16.1% and 22.7% of the ESs respectively. However, when background levels of SO<sub>2</sub> are added to the predicted PCs, the overall PECs are 28.1% (daily mean), 18% (hourly mean) and 25.2% (15-minute mean) respectively. In summary, we are satisfied that the ESs for SO<sub>2</sub> are unlikely to be exceeded under these abnormal operating scenarios.

(iv) Emissions to Air of CO, Formaldehyde, VOCs, PAHs, PCBs, Dioxins and NH<sub>3</sub>

Carbon monoxide (CO)

The Fichtner report shows that for CO, the peak short-term PC is less than 10% of the ES under all operating scenarios and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of CO to be BAT for the Installation.

VOC: Formaldehyde (CH<sub>2</sub>O)

The Fichtner report shows that for Formaldehyde emissions, (a specific type of VOC), the peak long-term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant under any operating scenarios.

Specifically, the maximum off-site long term Process Contribution (PC) is predicted to occur when MDF2 is offline and is modelled at  $1.91 \mu\text{g}/\text{m}^3$ . At 38.3% of the  $5 \mu\text{g}/\text{m}^3$  annual ES, this is greater than 1% of the long-term screening threshold and therefore cannot be screened out as insignificant. However, when background formaldehyde concentrations are added to the PC to give the Predicted Environmental Concentration (PEC), the PEC is 58.3% of the annual mean ES. As a comparison, the predicted maximum off-site long-term PC under normal operations is modelled at  $1.57 \mu\text{g}/\text{m}^3$ , which equates to 31.4% of the AQAL, so also cannot be screened out as insignificant. The PEC is 51.4% under normal operations. As such, the annual average ES is unlikely to be exceeded at any off-site location.

The peak short term hourly mean PC for Formaldehyde is also greater than 10% of ES and cannot be screened out as insignificant under any operating scenarios. The maximum off-site short-term PC is predicted to occur under normal operations and is modelled at  $54.46 \mu\text{g}/\text{m}^3$ , which equates to 54.5% of the short-term ES. When background formaldehyde concentrations are added to the PC to give the Predicted Environmental Concentration (PEC), the PEC is 56.5% of the short term hourly mean ES. As such, we are satisfied that the hourly mean ES is unlikely to be exceeded at any off-site location.

During the course of our determination, the Environment Agency issued an update to their Air Emissions Guidance on 29 April 2022. The update which is relevant to our determination is that the AQAL for short term formaldehyde has been revised to  $100 \mu\text{g}/\text{m}^3$  as a 30-minute mean, when previously it was  $100 \mu\text{g}/\text{m}^3$  as a 1-hour mean. The Air Emissions Guidance explains that if you have calculated a PC on an hourly basis, you must multiply it by 1.3 to convert it to a 30-minute average.

This means that the maximum off-site short-term PC under normal operations equates to 70.9% of the new 30-minute mean standard (as a maximum on the modelling grid) and the PEC is 72.9%. The maximum PC at an identified sensitive receptor is 29.5%

and the PEC is 31.5%. As such we are satisfied that the new short-term standard for formaldehyde is unlikely to be exceeded.

### Other VOCs

The origin of Total VOC releases to air at the installation is primarily from the formalin and resin plants and the production lines. As such the TVOC consists of gaseous components released from both the wood (particleboard and MDF product as it is dried during production), and the resin used in the process and manufactured on site. The primary VOC in the resin is formaldehyde which is considered separately above. The Production of Wood-based Panels BREF explains that, with the exception of formaldehyde, “The main constituents of the volatile organic fraction in wood are generally not considered in literature as possessing toxic properties”. Terpenes are cited as the main constituent of VOCs in some softwood species and softwoods tend to contain more VOC than hardwoods. The operator has provided long and short-term modelling predictions for TVOC but has not provided an Environmental Standard against which to compare them. However, based on the VOC data analysis presented in the Wood-based Panels BREF, we agree with the operator’s conclusion that the use of Benzene or 1,3-Butadiene environmental standards (as per Environment Agency web guidance), would not be representative of the actual releases coming from the installation. As an alternative, the Operator used the Environmental Standard for Xylene in their original permit application (EPR/BW9999IG) for the Formaldehyde and resin manufacturing plants back in 2004, which we were in agreement with. We are satisfied that this remains a representative Environmental Standard, as the source of the VOCs has not changed significantly since 2004. We have proceeded with our assessment on this basis.

The Environmental Assessment Levels (EAL) for Xylene (o-, m-, p- or mixed isomers) are: 4,410  $\mu\text{g}/\text{m}^3$  (annual) and 66,200  $\mu\text{g}/\text{m}^3$  (hourly). The Fichtner report shows that the highest predicted PC for annual releases of Xylene occurs under the MDF2 Offline scenario and is modelled at 24.86  $\mu\text{g}/\text{m}^3$ . This equates to less than 1% of the ES and can be screened out as insignificant. The highest predicted PC for hourly releases of Xylene occurs under the MDF1 Offline scenario and is modelled at 378.17  $\mu\text{g}/\text{m}^3$ . This equates to <10% of the short-term ES and can also be screened out as insignificant.

### PAHs

The Fichtner report shows that for PAH emissions, the peak long-term PC is less than 1% of the ES under all operating scenarios and so can be screened out as insignificant. The Applicant has also used the ES for benzo[a]pyrene (BaP) for their assessment of the impact of PAH. We agree that the use of the BaP ES is sufficiently precautionary.

### PCBs

The Fichtner report shows that for PCB emissions, the peak long-term PC is less than 1% of the ES and the peak short-term PC is less than 10% of the ES under all operating scenarios and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of PAH and PCBs to be BAT for the Installation.

### Dioxins and Furans

There is no ES for dioxins and furans as the principal exposure route for these substances is by ingestion and the risk to human health is through the accumulation of these substances in the body over an extended period of time. This issue is considered in more detail in section 6.3.2.

### Ammonia (NH<sub>3</sub>)

The ammonia emission is based on a release concentration of 15 mg/Nm<sup>3</sup> originating from K8 Biomass plant. For long term releases of NH<sub>3</sub>, this translates into a maximum predicted PC of 0.03 µg/m<sup>3</sup> occurring under most operating scenarios. This equates to 0.02% of the long-term ES, so screens out as insignificant.

The maximum predicted short term release for NH<sub>3</sub> is modelled at 1.11 µg/m<sup>3</sup> (occurring during both normal operations and the MDF 2 Offline scenarios). This equates to 0.04% of the short-term ES, so screens out as insignificant. No further assessment is required for this pollutant and we are satisfied that this level of emission is consistent with the operation of a well-controlled SNCR NO<sub>x</sub> abatement system.

### Assessment of emissions of metals from K8 IED Chapter IV Waste Biomass Plant

The Applicant has assessed the impact of metal emissions to air.

Annex VI of IED sets three limits for metal emissions:

- An emission limit value of 0.05 mg/m<sup>3</sup> for mercury and its compounds (formerly WID group 1 metal).
- An aggregate emission limit value of 0.05 mg/m<sup>3</sup> for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.5 mg/m<sup>3</sup> for antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds (formerly WID Group 3 metals).

In addition the UK is a Party to the Heavy Metals Protocol within the framework of the UN-ECE Convention on long-range trans-boundary air pollution. Compliance with the IED Annex VI emission limits for metals along with the Application of BAT also ensures that these requirements are met.

The applicant has used the screening methodology outlined in the Environment Agency guidance document “Guidance on assessing Group 3 Metal Stack Emissions from Incinerators” – V.4, for their assessment of releases of Group 3 metals. This guidance is a step-by-step method for impact assessment of Group 3 metals from Municipal Waste Incinerators (MWIs) and waste wood co-incinerators. The guidance document contains measured emissions data from 18 MWIs and waste wood co-incinerators between 2007 and 2015.

### Group 1

The following emissions of metals were screened out as insignificant under all operating scenarios, in terms of the maximum values on the modelling grid, as they are predicted to be <1% and <10% of the long and short term EALs respectively:

- In respect of long-term impacts: Mercury
- In respect of short-term impacts: Mercury

## Group 2

For the Group 2 metals, the applicant has assumed that cadmium is emitted at 100% of the aggregate emission limit. (There is no EQS / EAL for thallium). On this basis, the maximum PC on the modelling grid is 2.3% of the cadmium EQS (under the normal operations and MDF2 Offline scenarios), so cannot be screened out as insignificant. However, when the existing background concentrations are taken into account, the PEC is 3.9% of the EQS. We are therefore satisfied that significant pollution will not be caused and that an exceedance of the EQS is unlikely.

## Group 3

The following emissions of metals were screened out as insignificant as they are predicted to be <1% and <10% of the long and short term EALs respectively:

- In respect of long-term impacts: Antimony, Chromium, Copper, Lead, Manganese and Vanadium.
- In respect of short-term impacts: Antimony, Chromium, Copper, Manganese and Vanadium.

There is no Long Term EQS / EAL for Cobalt and no short term EQS/EAL for Arsenic, Chromium VI, Cobalt, Lead and Nickel as individual metals. Releases of these metals do not therefore require further assessment.

The following emissions of metals whilst not screened out as insignificant were assessed as being unlikely to give rise to significant pollution:

- In respect of long-term impacts: Arsenic and Nickel.

This left emissions of Long-Term Chromium VI, requiring further assessment. For all other metals, the Applicant has concluded that exceedances of the EAL for all metals are not likely to occur.

The Industrial Emissions Directive sets a mandatory aggregate emission limit value (ELV) of 0.5 mg/m<sup>3</sup> for the nine Group 3 Metals and their components. The Applicant's assessment assumes that each metal is emitted individually at the relevant aggregate emission limit value. This is a something which can never actually occur in practice as it would inevitably result in a breach of the said limit, and so represents a very much worst-case scenario.

For long term Chromium VI releases the Applicant used representative emissions data from other municipal and waste wood co-incinerators using Environment Agency guidance note "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4". Measurement of Chromium (VI) at the levels anticipated at the stack emission points is expected to be difficult, with the likely levels being below the level of detection by the most advanced methods.

### Chromium VI

Chromium VI is not specifically referenced in Annex VI of IED, which includes only total Chromium as one of the nine Group 3 metals, the impact of which has been assessed above. The long term EAL for Chromium VI is 0.25 ng/m<sup>3</sup>. The applicant has used a precautionary EAL of 0.2 ng/m<sup>3</sup>.

Table A1 of the Environment Agency's "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4" shows that Chromium VI releases are likely to account for a maximum of 0.03% of the total IED Group 3 Metal ELV of 0.5 mg/m<sup>3</sup>, based on data from 18 other Municipal Waste Incinerators and Waste Wood Co-incinerators between 2007 and 2015. This translates to long term chromium VI process contribution of 0.0003 ng/m<sup>3</sup>, which is 0.17% of the 2 ng/m<sup>3</sup> EAL. As such, predicted releases of Chromium VI screen out as insignificant using Step 2 of the Environment Agency's approach in "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4".

## 6.2.4 Consideration of Local Factors

### (i) Impact on Air Quality Management Areas (AQMAs)

No Air Quality Management Areas (AQMAs) have been declared within an area likely to be affected by emissions from the installation.

### Impact of Abnormal Operation of K8 IED Chapter IV Waste Wood Biomass Plant

Article 50(4)(c) of IED requires that waste incineration and co-incineration plants shall operate an automatic system to prevent waste feed whenever any of the continuous emission monitors show that an emission limit value (ELV) is exceeded due to disturbances or failures of the purification devices. Notwithstanding this, Article 46(6) allows for the continued incineration and co-incineration of waste under such conditions if this period does not (in any circumstances) exceed 4 hours uninterrupted continuous operation or the cumulative period of operation does not exceed 60 hours in a calendar year. This is a recognition that the emissions during transient states (e.g. start-up and shut-down) are higher than during steady-state operation, and the overall environmental impact of continued operation with a limited exceedance of an ELV may be less than that of a partial shut-down and re-start.

The Applicant has not provided an assessment of half-hourly average ELVs for K8 or an abnormal operations impact assessment specific to K8 in combination with emissions from the rest of the site, in the consolidated Fichtner modelling report dated 15/12/2021. Therefore, the ELV's for TOC, CO and particulate matter as stated by IED in Table S3.3 of the Permit will apply when the Installation is operating. The applicant will immediately stop feeding waste/shut down K8 for each type of scenario that would otherwise allow abnormal operation. Table S1.1 of the Permit, specifies that abnormal operation of K8 is not permitted.

Permit condition 2.3.9 has been modified to reflect the fact that abnormal operation is not permitted and other permit conditions allowing abnormal operation previously in the WCBC permit have not been transferred across to the NRW permit.

The half hour average monitoring for K8 in schedule 3 is included as the trigger linked to condition 2.3.9. The operator has not been permitted abnormal operation.

## **6.3 Human Health Risk Assessment**

### **6.3.1 Our role in preventing harm to human health**

Natural Resources Wales has a statutory role in the protection of the environment and human health from the processes and activities it regulates.

The installation will be regulated under the EPR. These regulations include the requirements of relevant EU Directives, notably the IED, the WFD and the AAD.

The main conditions for K8 Biomass Plant are based on the requirements of the IED. Specific conditions have been introduced to specifically ensure compliance with the requirements of Chapter IV.

The aim of the IED is to prevent or where that is not practicable, to reduce emissions to air, water and land and to prevent the generation of waste, to achieve a high level of protection of the environment taken as a whole.

IED achieves this aim by setting operational conditions, technical requirements and emission limit values to meet the requirements set out in Articles 11 and 18 of the IED. These requirements include the application of BAT, which may in some circumstances dictate tighter emission limits and controls than those set out in Chapter IV of the IED on waste incineration and co-incineration plants.

Comparing the results of the air dispersion modelling against European and national air quality standards effectively makes a health risk assessment for those pollutants for which a standard has been derived.

These air quality standards have been developed primarily to protect human health via known intake mechanisms, such as inhalation and ingestion. Some pollutants, such as dioxins, furans and dioxin like PCB's, have health impacts at lower ingestion levels than lend themselves to setting an air quality standard to control against. For these pollutants, a different human health risk model is required which better reflects the level of dioxin intake.

Models are available to predict the dioxin, furan and dioxin like PCB's intake for comparison with the Tolerable Daily Intake (TDI) recommended by the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment, known as COT. These include HHRAP and the HMIP models.

The Human Health Risk Assessment Protocol (HHRAP) has been developed by the US EPA to calculate the human body intake of a range of carcinogenic pollutants and to determine the mathematic quantitative risk in relation to probability.

In the UK, in common with other European countries, we consider a threshold dose below which the likelihood of an adverse effect is regarded as being very low or effectively zero. The HMIP model uses a similar approach to HHRAP model, but does not attempt to predict risk using probabilities. Either model can however be used to make comparisons with the TDI.

The TDI is the amount of a substance that can be ingested daily over a lifetime without appreciable health risk. It is expressed in relation to bodyweight to allow for different body size, such as for children of different ages. In the UK, the COT has set a TDI for dioxins, furans and dioxin like PCB's of 2 picograms I-TEQ/Kg body weight/day (N.B. a picogram is million millionths (10<sup>-12</sup>) of a gram).

In addition to an assessment of risk from dioxins and furans, the HHRAP model enables a risk assessment from human intake of a range of heavy metals. The HMIP report does not consider metals and PCBs. In principle, the respective EQS for these metals are protective of human health. It is therefore not necessary to model the human body intake.

## Consultations

As part of our normal procedures for the determination of a permit application, we consult with Local Authorities, Local Health Board Directors of Public Health, FSA and PHW. We also consult the local communities who may raise health related issues. All issues raised by these consultations are considered in determining the application as described in Annexes 1A and 1B of this document.

### 6.3.2 Assessment of Intake of Dioxins, Furans and Dioxin like PCBs

For dioxins, furans and dioxin like PCBs, the principal exposure route is through ingestion, usually through the food chain, and the main risk to health is through accumulation in the body over a period of time.

The human health risk assessment calculates the dose of dioxins and furans that would be received by local receptors if their food and water were sourced from the locality where the deposition of dioxins, furans and dioxin like PCBs is predicted to be the highest. This is then assessed against the Tolerable Daily Intake (TDI) levels established by the COT of 2 picograms I-TEQ / Kg bodyweight/ day.

The results of the Applicant's assessment of dioxin intake are detailed in the table below. (worst – case results (point of maximum impact) for each category are shown). The results showed that the predicted daily intake of dioxins, furans and dioxin like PCBs at all receptors, resulting from emissions from the proposed facility, were significantly below the recommended TDI levels. The Maximum Daily Intake as a percentage of the TDI is shown as PEC in the table below, as this figure represents the total overall intake of dioxins from both the process contribution from the installation and the existing levels of dioxins in the environment.

Receptor	Adult		Child	
	PC (% of TDI)	PEC (% of TDI)	PC (% of TDI)	PEC (% of TDI)
<b>Agricultural</b>	0.20	35.20	0.29	90.94
<b>Allotment</b>	0.01	35.01	0.02	90.67
<b>Residential</b>	0.005	35.01	0.01	90.66
<b>Fisher</b>	0.15	35.15	0.10	90.75

Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility (I-TEQ/ kg-BW/day)

The modelling has shown that the maximum contribution of the facility to the COT TDI is 0.29% for the farmer receptors, 0.02% for Allotment receptors, 0.01% for residential receptors and 0.15% for the Fisher receptor.

As these maximum predicted PCs are <1% of the COT TDI, we are satisfied that the impact of emissions on local sensitive receptors is not significant.

The risk assessment methodology used in this assessment has been structured to create worst case estimates of risk.

Several features in the methodology give rise to this degree of precaution. It has been demonstrated that for the maximally exposed individual, exposure to dioxins, furans and dioxin-like PCBs is not significant.

### **6.3.3 Particulates smaller than 2.5 microns**

The Operator will be required to monitor particulate emissions using the method set out in Table S3.1 of Schedule 3 of the Permit. This method requires that the filter efficiency must be at least 99.5% on a test aerosol with a mean particle diameter of 0.3 µm, at the maximum flow rate anticipated. The filter efficiency for larger particles will be at least as high as this. This means that particulate monitoring data effectively captures everything above 0.3 µm and much of what is smaller. It is not expected that particles smaller than 0.3 µm will contribute significantly to the mass release rate/concentration of particulates because of their very small mass, even if present. This means that emissions monitoring data can be relied upon to measure the true mass emission rate of particulates.

Nanoparticles are considered to refer to those particulates less than 0.1 µm in diameter (PM0.1). Questions are often raised about the effect of nanoparticles on human health, (both adults and children), because of a) their high surface to volume ratio, making them more reactive, and b) their very small size, giving them the potential to penetrate cell walls of living organisms.

The small size also means there will be a larger number of small particles for a given mass concentration.

The HPA (now PHE) addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from Municipal Incinerators'. It refers to the coefficients linking PM10 and PM2.5 with effects on health derived by COMEAP and goes on to say that if these coefficients are applied to small increases in concentrations produced, locally, by incinerators; the estimated effects on health are likely to be small.

PHE notes that the coefficients that allow the use of number concentrations in impact calculations have not yet been defined because the national experts have not judged that the evidence is sufficient to do so. This is an area being kept under review by COMEAP.

In December 2010, COMEAP published a report on The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. It says that: "a policy which aims to reduce the annual average concentration of PM2.5 by 1 µg/m<sup>3</sup> would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

We take the view, based on the foregoing evidence, that techniques which control the release of particulates to levels which will not cause harm to human health will also control the release of fine particulate matter to a level which will not cause harm to human health.

#### **6.3.4 Assessment of Health Effects from the Installation**

We have assessed the health effects from the operation of this installation in relation to the above (sections 6.3.1 to 6.3.3). We have applied the relevant requirements of the national and European legislation in imposing the permit conditions. We are

satisfied that compliance with these conditions will ensure protection of the environment and human health.

In carrying out air dispersion modelling as part of the Environmental Impact assessment and comparing the predicted environmental concentrations with European and national air quality standards, the Applicant has effectively made a health risk assessment for many pollutants. These air quality standards have been developed primarily in order to protect human health.

The Applicant's assessment of the impact from the pollutants listed above, have all indicated that the Installation emissions screen out as insignificant; where the impact of emissions have not been screened out as insignificant, the assessment still shows that the predicted environmental concentrations are within air quality standards or environmental action levels.

Natural Resources Wales has reviewed the methodology employed by the Applicant to carry out the health impact assessment.

Natural Resources Wales has reviewed the methodology employed by the Applicant to carry out the health impact assessment. The applicant used the modelling software (IRAP-H View – Version 4) to make their human intake predictions. This software is commonly used for this purpose and incorporates the USEPA HHRAP equations.

Natural Resources Wales has reviewed the methodology employed by the Applicant to carry out the health impact assessment.

Overall, taking into account the conservative nature of the impact assessment (i.e. that it is based upon an individual exposed for a lifetime to the effects of the highest predicted relevant airborne concentrations and consuming mostly locally grown food), it was concluded that the operation of the proposed facility will not pose an appreciable human health risk.

Public Health Wales (PHW) and Betsi Cadwaladr University Health Board were consulted on the Application twice. The first time as part of the original consultation

when the variation application was received and the second time we re-consulted on the updated air dispersion modelling provided by Fichtner on 15 December 2015.

Taking into account all of the expert opinion available, we agree with the conclusion reached by PHW that:

“we have no grounds for objection based on the public health considerations contained within the application and provided the site is operated in line with current sector guidance and BAT (Best Available Techniques). The risk assessment suggests that exceedances of health-based air quality objectives are unlikely. As there is no safe level of exposure for many air pollutants, we would stress the need to ensure that emissions from this site are well managed and regulated and that the impact on local air quality is kept as low as possible.

We support the decision to consolidate the existing permits into one which we believe will add clarity to the permitting of the site”.

The Food Standards Agency (FSA) was also consulted during the permit determination process and raised no issues, instead confirming that they would not be commenting on the application. Details of the responses provided by Public Health Wales, Betsi Cadwaladr University Health Board and the FSA to the consultation on this Application can be found in Annex 1.

Natural Resources Wales is therefore satisfied that the Applicant's conclusions presented above are soundly based and we conclude that the potential emissions of pollutants including dioxins, furans and metals from the proposed facility are unlikely to have an impact upon human health.

The release of Dioxins and Furans to air is required by the IED to be assessed against the International Toxic Equivalence (I-TEQ) limit of 0.1ng/m<sup>3</sup>. Further development of the understanding of the harm caused by dioxins has resulted in the World Health Organisation (WHO) producing updated factors to calculate the WHO-TEQ value.

Certain PCBs have structures which make them behave like dioxins (dioxin-like PCBs), and these also have toxic equivalence factors defined by WHO to make them capable of being considered together with dioxins.

The UK's independent health advisory committee, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) has adopted WHO-TEQ values for both dioxins and dioxin-like PCBs in their review of Tolerable Daily Intake (TDI) criteria.

In support of the requirements of the IED, the WHO-TEQ values for both dioxins and dioxin-like PCBs have been specified for monitoring and reporting purposes, to enable an evaluation of exposure to dioxins and dioxin-like PCBs to be made using the revised TDI recommended by COT.

The release of dioxin-like PCBs and PAHs is expected to be low where measures have been taken to control dioxin releases. We specify monitoring of a range of PAHs and dioxin-like PCBs in waste incineration Permits at the same frequency as dioxins are monitored.

The permit contains a requirement to monitor and report against these WHO-TEQ values for dioxins and dioxin-like PCBs and the range of PAHs identified by Defra in their previous Environmental Permitting Guidance on the Waste Incineration Directive.

NRW is confident that the measures taken to control the release of Dioxins will also control the releases of Dioxin-like PCBs and PAHs. The Installation's impact to air has been discussed previously in this document, in the Air Quality Assessment and Human Health Risk Assessment section, this concluded that there will be no adverse effect on human health from operations.

#### **6.4 Biodiversity, Heritage, Landscape and Nature Conservation**

Kronospan have considered 2 x operating scenarios in their assessment of ecological impacts:

- (i) **Normal Operations** – Under normal operations, exhaust gases from the combustion plant are used within the particleboard manufacturing process driers and exit to atmosphere via the drier cyclones. The relevant emissions from the Facility are from the K1 boiler, MDF 1 cyclone, MDF 2 cyclone, and WESP 21.
- (ii) **Non-standard Operations Scenario 1: MDF2 Offline** - MDF 1 drier can use the exhaust gases from the K7 and K8 biomass plants and three gas engines, the electricity needed on site would be reduced so only three gas engines would be needed; two of which would be used in MDF 1 drier, and one would need to vent to atmosphere via its own dedicated stack. Therefore, the only relevant emissions from site would be from the K1 boiler, MDF 1 cyclone, a single gas engine, and WESP 21.

Other operating scenarios are possible, but modelling analysis has shown that this would have a lower environmental impact than either the normal operations or MDF 2 offline scenario and as such these have not been considered further. Similarly, operating scenarios which occur for less than 24-hours are also not considered because the CLes and Clos are expressed as annual, weekly and daily means and annual deposition rates respectively.

The following nature conservation sites are within the relevant screening distances for an EPR installation with discharges to air. The protected habitats and species search was centred on the main cluster of combustion emission points to air (grid reference: SJ 28487 38348), hereafter known as "the search point".

European Sites within 10km of the search point:

- Berwyn a Mynyddoedd de Clwyd / Berwyn and South Clwyd Mountains (SAC)
- Johnstown Newt Sites (SAC)
- River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales) (SAC)
- River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (England) (SAC)
- Berwyn (SPA)

There are no Ramsar Sites within 10km of the search point.

Sites of Special Scientific Interest within the 2km of the search point.

- River Dee (Afon Dyfrdwy)
- Chirk Castle and Parkland / Castell Y Waun a'i Barcdir

Nant-Y-Belan and Prynella Woods SSSI is located approximately 2.2 kilometres to the north-east of the installation boundary. Although this SSSI exceeds the 2km screening threshold for releases to air from industrial installations, the applicant has considered it in their own habitats risk assessment, so we have included it in this determination as a precautionary measure.

Non-statutory sites within 2km of the search point:

- Barracks Field (Local Wildlife Site)
- Coed-Y-Camlas / Canal Wood (Local Wildlife Site)
- There are 66 Ancient Woodland sites within 2km of the search point, the closest of which is Coed-y-Camlas / Canal Wood (Restored Ancient Woodland Site), located approximately 140 metres to the west.

There are no National Nature Reserves or Local Nature Reserves within 2km of the search point.

A full assessment of the application and its potential to affect the sites, species and habitats has been carried out as part of the permitting process. We consider that the application will not affect the features of the sites, species and habitats.

As there are no changes to any process emissions to water associated with this variation, the habitats assessment focused exclusively on aerial releases from the entire installation. Our assessment included predicted releases to air associated with the new Chip Dryer No. 4 and WESP 21.

The conclusion of our assessments must also be viewed in the wider context related to the purpose of this variation (see [Background to the Variation](#) section above). Prior to NRW becoming the single regulator for the site, we are ensuring that the impact of the whole factory on surrounding protected sites is assessed. As such, the outcome of this assessment will set the baseline against which further measurable regulatory improvements can be implemented in future.

The predicted process contributions (PCs) from Kronospan and Predicted Environmental Concentrations (PEC) (ambient background level of a pollutant + the PC) are presented for each operating scenario in the “Kronospan Dispersion Modelling Assessment” by Fichtner Consulting Engineers Ltd (dated 15/12/21, report reference S2376-0030-0003RSF). This is available on our online public register for ease of reference. The remainder of this section summarises the results of our assessment using the operating scenario with the highest predicted PCs in all cases to be precautionary. Tables listing the results for each ecological site, pollutant and operating scenario can be referenced in the Fichtner modelling report.

### **European Sites and Protected Species Assessment**

#### **Berwyn a Mynyddoedd de Clwyd / Berwyn and South Clwyd Mountains (SAC)**

##### **Assessment of the Installation Alone**

The potential impact pathways which were assessed for the features of the SAC were nutrient enrichment and acidification. The features which were assessed were: Bogs and Wet Habitats, Dry Grassland, Dry Heathland Habitats and Upland.

We are satisfied that for all features the maximum Predicted Contributions (PC) are <1% of the annual Critical Levels (CLes) for Ammonia (NH<sub>3</sub>) and Sulphur Dioxide (SO<sub>2</sub>), and <10% of the short term CLes for Oxides of Nitrogen (NO<sub>x</sub>), and Hydrogen Fluoride (HF). For acid deposition, we have used the Critical Load Function tool on the Air Pollution Information System (APIS) website and this has confirmed that no exceedance of the Critical Load function will occur at any feature. In addition, we are satisfied that the PC for nutrient nitrogen deposition screens out below 1% of the lower annual Critical Load (CLo) for the dry grassland and dry heathland habitat features. As such, we have concluded that emissions of these pollutants will not have a likely significant effect on the SAC features stated above and therefore no further assessment is needed.

We have proceeded to the appropriate assessment phase for predicted releases of oxides of nitrogen (when assessed against the annual CLe) and nitrogen deposition at the Bogs and Wet Habitats and Upland features of the SAC. This is because predicted PCs did not screen out below 1% of the CLe and CLo respectively. As such,

our appropriate assessment considers the PEC, which is the predicted PC added to the ambient background at these interest features, to determine if adverse effects on site integrity can be ruled out.

We are satisfied that the PEC for oxides of nitrogen is <70% of the annual CLe at each of the 4 features considered and that no further assessment is needed, because an adverse effect on site integrity can be ruled out as a result of releases from the Kronospan site alone.

We have examined predicted nitrogen deposition at the bogs and wet habitats and upland features because background nitrogen deposition is already exceeding the relevant CLos at these units of the SAC that are closest to the Kronospan site. As such, the PEC automatically exceeds the CLos, due to existing ambient background levels at the SAC.

“Bogs and Wet Habitats” is a widespread Key Habitat within the SAC. It is present in the closest management unit to Kronospan (Unit 134) and it is this unit that is likely to experience the highest deposition levels. From here, predicted PCs decrease with distance, therefore the assessment focuses on management unit 134, as if no significant adverse effect is predicted in this unit, then it follows that all other units will also not experience any adverse effect on site integrity.

The conservation status is currently unfavourable, declining due to inappropriate grazing, burning and drainage, although the core management plan for the SAC does highlight this habitat as being sensitive to nitrogen deposition, with the result being that grasses are likely to outcompete the bog species. The source attribution for existing nitrogen deposition at the site is as for the Upland habitat as described below.

The Kronospan predicted PC is 1.1% of the lower CLo at the closest part of the SAC under normal operations modelled at the Limits Case. The more realistic Likely Case is based on actual monitored data, but would require a tightening of NO<sub>x</sub> emission limits for the emission points serving MDF1 & 2 and WESP 21 in the permit to achieve. Under the Likely Case, the highest predicted PC occurring during normal operations

is 0.52% of the 5 KgN/ha/yr lower CLo, which screens out as insignificant and hence no likely significant effect alone.

We have therefore decided to impose the Likely Case emission limit of 100 mg/m<sup>3</sup> NO<sub>x</sub> for emission points A29, A30 and A32 to ensure no adverse effect on site integrity (see [Emission Limits](#) section below).

“Upland” is a Key Habitat within the SAC occurring in the following management units: 134, 135, 136, 137 and 141. Of these units 137 and 141 are closest to the site and likely to experience the highest deposition levels. From here, predicted PCs decrease with distance, therefore the assessment focuses on management units 137 and 141, as if no significant adverse effect is predicted in these units, then it follows that the other units will also not experience any adverse effect on site integrity.

The conservation status is currently unfavourable due to heavy grazing, which is causing lack of species diversity in the cracks and fissures of the rocky slopes. The APIS website also confirms that the largest proportion of background nitrogen deposition at the SAC (35%) is attributable to livestock, with the next largest proportion (25%) coming across from Europe (e.g. Eire). Emissions from industrial combustion (combined UK sources), account for 1.2% of the total nitrogen deposition at the SAC.

The Kronospan predicted PC is just over the 1% significance threshold at the closest part of the SAC under normal operations modelled at the Limits Case. The more realistic Likely Case is based on actual monitored data, but would require a tightening of NO<sub>x</sub> emission limits for the emission points serving MDF1 & 2 and WESP 21 in the permit to achieve. Under the Likely Case, the highest predicted PC occurring during normal operations is 0.52% of the 5 KgN/ha/yr lower CLo, which screens out as insignificant and hence no likely significant effect alone.

We have therefore decided to impose the Likely Case emission limit of 100 mg/m<sup>3</sup> NO<sub>x</sub> for emission points A29, A30 and A32 to ensure no adverse effect on site integrity. (see [Emission Limits](#) section below).

In summary, we are satisfied that predicted releases to air from the installation, when considered alone, will not adversely affect the integrity of the Berwyn and South Clwyd Mountains.

### **In Combination Assessment**

We have considered if there is likely to be any significant in-combination effect with other plans and projects in the context of the site's conservation objectives. In terms of nutrient enrichment due to aerial releases of NO<sub>x</sub>, NH<sub>3</sub> and nitrogen deposition, the core management plan for the SAC explains that all four designated habitat types are in unfavourable or unfavourable declining status. Although each habitat is sensitive to nutrient enrichment and acidification, the reason for unfavourable status is attributed to overgrazing (bogs & wet habitats, dry grassland, dry heath & upland) as well as burning and drainage (of bogs and wet habitats). This is supported by the fact that nutrient enrichment from industrial combustion is attributed to just 1.2% of the total source attribution, with over 35% of existing deposition attributed to Livestock. Whilst background levels of NH<sub>3</sub> are on an upward trend due primarily due to agriculture, NO<sub>x</sub> concentrations at the SAC have seen a marked decline since around 2012, which is expected to continue into the future with the move to an electric vehicles fleet up to and beyond 2030 and the imposition of NO<sub>x</sub> emission limits for existing Medium Combustion Plant across the UK in 2025 and 2030.

Therefore, in this particular case, we consider that an in-combination assessment would not realistically achieve any improved environmental outcome for the SAC because the PC at the closest point for NH<sub>3</sub> and daily mean NO<sub>x</sub> is below are insignificance screening criteria of <1 and 10% respectively. As the site is operational, the modelling is also precautionary as the existing PCs are already part of the ambient background, so there will be an element of double counting. The closest part of the SAC is 5.6km northwest of our search point at the installation and is in the lee of the prevailing wind direction. As such we are satisfied that most of the contributions to NH<sub>3</sub> and NO<sub>x</sub> at the SAC are from other sources and that it is these that require focus in order to achieve improvements in the conservation status.

For acidification due to aerial releases of SO<sub>2</sub> and HF and acid deposition, we have already reached a conclusion of no likely significant effect alone for SO<sub>2</sub> for the four

habitat types. Also the APIS website shows that background SO<sub>2</sub> at the closest point of the SAC is not exceeding the CLe and there has been a marked decline in background SO<sub>2</sub> at the site since around 2013.

In addition, the PCs for both weekly and daily mean HF CLeS are an order of magnitude (to the power of 10) below the 10% threshold at which they would be screened out as insignificant. As such, there is no additional value in performing an in-combination assessment because the PC from Kronospan is already a fraction of the insignificance threshold.

We have also concluded no likely significant effect alone for acid deposition, as the Critical Load Function Tool shows no likelihood of exceedance in APIS.

In this particular case, we consider that an in-combination assessment for these pollutants would not realistically achieve any improved environmental outcome for the SAC. The core management plan shows that one of the main causes of the current unfavourable status is overgrazing from livestock. As the site is operational, the modelling is also precautionary as the existing PCs are already part of the ambient background, so there will be an element of double counting. The closest part of the SAC is 5.6km northwest of our search point at the installation and is in the lee of the prevailing wind direction. As such we are satisfied that most of the contributions to SO<sub>2</sub>, HF and acid deposition at the SAC are from other sources and that it is these that require focus in order to achieve improvements in the conservation status.

In terms of nitrogen deposition at the dry grassland and dry heathland habitats, we have already reached a conclusion of no likely significant effect alone under the Limits Case. However the setting of the Likely Case ELV of 100 mg/m<sup>3</sup> NO<sub>x</sub> for emission points A29, A30 and A32 (described above), will reduce predicted PCs even further below 1%. This can be set against a background of nitrogen deposition which is already exceeding the lower CLoS for both these habitat types, although the annual trend data does show a gradually decreasing trend.

In this particular case, we consider that an in-combination assessment would not realistically achieve any improved environmental outcome for the SAC because the

PC at the closest point for N deposition is <1% and represents a very small proportion of the overall PEC at the SAC for this pollutant. The other supporting arguments outlined in the previous paragraphs of this section also apply.

Finally for nutrient enrichment, where we have imposed the Likely Case ELV of 100 mg/m<sup>3</sup> NO<sub>x</sub> for emission points A29, A30 and A32, we have determined that this tightened ELV reduces predicted process contributions down to <1% of the NO<sub>x</sub> annual CLe and nitrogen deposition CLo, so a conclusion of no likely significant effect alone can be reached with mitigation. As such, we consider that an in-combination assessment would not realistically achieve any improved environmental outcome for the SAC because the PC at the closest point for annual NO<sub>x</sub> releases and Nitrogen deposition will be <1% and represents a very small proportion of the overall PEC at the SAC for this pollutant.

## **Summary**

In light of the conclusions of an appropriate assessment, and taking account of the advice received from protected sites advisors, it has been established that aerial emissions from the installation will not adversely affect the integrity of any National Site Network (formerly Natura 2000)//Ramsar site or undermine the conservation objectives, taking into account any conditions or restrictions as applicable, either alone or in-combination with other plans and projects.

## **Berwyn (SPA)**

Air pollutants associated with nutrient enrichment and acidification are assessed for designated habitats within a protected site, rather than the protected species living within the site. This is because it is the vegetation that is sensitive to change as a result of the presence of these pollutants.

The four designated bird species within the SPA are not directly sensitive to aerial pollution and there are no associated critical loads set on APIS, so no further assessment is needed. However, the SPA boundary overlays the boundary of the Berwyn and South Clwyd Mountains SAC, which is designated for particular vegetative habitat features, which are directly sensitive to aerial pollution. As such, our

consideration of aerial process contributions from Kronospan focuses on the SAC habitat types in the Berwyn and South Clwyd Mountains SAC section above.

In terms of potential disturbance due to noise from the installation, the closest boundary of the SPA is approximately 8.8 km to the west of the installation search point. The intervening distance is mainly comprised of agricultural and wooded land bisected by a network of minor roads. As the installation is located a considerable distance away from the SPA, it is unlikely to be audible to the protected birds. The birds are more likely to be disturbed by human activity near their nesting and feeding sites, rather than from an industrial source nearly 9km away.

### **Johnstown Newt Sites (SAC)**

Air pollutants associated with nutrient enrichment are assessed for designated habitats within a protected site, rather than the protected species living within the site. This is because it is the vegetation that is sensitive to change as a result of the presence of these pollutants. The Johnstown Newt Sites SAC does not contain any designated habitat. The only designated feature is the Great Crested Newt, for which no Critical Loads are set on APIS because the species is not sensitive to aerial pollution. No further assessment is required.

We have also considered the potential impact pathway of smothering by Particulate Matter (PM<sub>10</sub> & PM<sub>2.5</sub>). Particulate Matter are deposited slowly but may travel 1000m or more. However, concentrations decrease rapidly on moving away from the source, due to dispersion and dilution. Johnstown Newt Sites SAC is located approximately 6.7 kilometres to the north-east of the installation search point at its closest point. We therefore consider that there is no realistic impact pathway to the SAC.

Finally, we have considered noise disturbance and concluded that there is no realistic impact pathway to the SAC for that either. The boundary of the SAC at its closest point is approximately 6.7 km to the northeast of the installation search point. The intervening distance is bisected by major roads including the A5 and the River Dee. The settlement of Ruabon also sits between the closest part of the SAC and the installation. As such it can be concluded that noise from the installation would not be audible to the great crested newts.

## River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales) (England) (SAC)

The vegetative interest features of the SAC within the 10km screening distance of the search point are limited to aquatic features only. There are no Critical Levels (CLE) or Critical Loads (CLO) for aquatic features. More specifically, it is considered that the CLe for atmospheric NO<sub>x</sub> concentrations and nutrient nitrogen and acid deposition CLOs are not applicable to river systems due to low sensitivities from aerial sources. As such, any further consideration of nitrogen or acid deposition is not required.

Fish and invertebrate interest features are considered to be an in-water/riverine features and not sensitive to airborne pollution. Therefore, fish and invertebrate species are not considered to be at risk from aerial emissions associated with the installation and there are no CLEs or CLOs set for these features.

We consider that there is unlikely to be any reduction in the quality or extent of otter habitat due to nutrient enrichment and acidification associated with this variation. In terms of disturbance there is no change to the existing impact pathway as a result of this variation. The core management plan states that Otters are sensitive to human disturbance and especially sudden changes in activity (e.g. disturbance by dogs). Also, female otters are particularly sensitive to disturbance when they have cubs. However, in terms of noise, otters habituate and grow accustomed to continuous noise (such as industrial noise). The general noise source associated with Kronospan has been present since the factory started operation in the early 1970s and we consider that noise impacts will not change significantly as a result of this variation. There is also the potential for noise from the installation to reduce in future through the regulatory control mechanisms afforded by the Environmental Permit.

In summary, we have concluded that aerial releases from the installation will not undermine the conservation objectives for the Berwyn SPA, Johnstown Newt Sites SAC and River Dee and Bala Lake SAC and that the operation of the installation will not adversely affect the integrity of these protected sites either alone or in combination.

We have consulted with the statutory nature conservation body in Wales (Natural Resources Management directorate of NRW) on our assessment of all the European

Sites listed above. We also consulted with Natural England on our assessment for the River Dee and Bala Lake SAC. The conservation body in Wales are in agreement with our conclusions. We did not receive any relevant comments from Natural England. However, the border of England and Wales runs down the middle of the River Dee, where the English part of the site was identified as being within the relevant screening distance criteria. As such, one bank is the Welsh SAC and the opposite riverbank is the English SAC. It is therefore logical (and indeed there is no reason why) agreement of the conservation body in Wales would not be the same for Natural England.

### SSSI Assessment

Our assessment for SSSI's considers the likelihood of damage to any of the interest features listed. We have assessed the likelihood of damage from nutrient enrichment and acidification for each of the three relevant SSSIs identified. We have also additionally considered the potential for smothering of interest features due to aerial releases of Particulate Matter (PM<sub>10</sub> & PM<sub>2.5</sub>) (PM) at Chirk Castle SSSI and Nant-y-Belan and Prynela Woods SSSI, as well as the potential for disturbance to the Bat population at Chirk Castle SSSI.

For the **River Dee (Afon Dyfrydwy)**, all parts of the SSSI within the 2km screening distance of the search point are limited to aquatic features only. There are no Critical Levels (CL<sub>e</sub>) or Critical Loads (CL<sub>o</sub>) for aquatic features.

More specifically, it is considered that the CL<sub>e</sub>s for atmospheric nitrogen oxides (as NO<sub>2</sub>), SO<sub>2</sub>, HF and NH<sub>3</sub> concentrations and the nutrient nitrogen and acid deposition CL<sub>o</sub>s are not applicable to river systems due to low sensitivities from aerial sources. As such, any further consideration of nitrogen or acid deposition is not required and we have concluded that aerial emissions from the installation are not likely to damage any of the special interest features of the River Dee (Afon Dyfrydwy) SSSI.

For **Nant-y-Belan and Prynela Woods SSSI**, we are satisfied that predicted PC<sub>s</sub> of NH<sub>3</sub> screen out as insignificant at <1% of the more precautionary CL<sub>e</sub> for use where lichen and bryophytes are present. The predicted HF PC also screens out as insignificant at <10% of short term CL<sub>e</sub>s. We have used the Critical Load Function

Tool on the APIS website to confirm that there will be no exceedance of the Critical Load function for acid deposition at the site.

In terms of the potential for smothering by PM<sub>10</sub> & PM<sub>2.5</sub>, Particulate Matter are deposited slowly but may travel 1000m or more. However, concentrations decrease rapidly on moving away from the source, due to dispersion and dilution. Nant-Y-Belan and Prynella Woods SSSI is located approximately 2.2 kilometres to the north-east of the installation boundary, so on this basis, we consider that this mechanism of effect is unlikely to damage the interest features of the SSSI, based on distance from the source.

We have calculated the PEC for annual releases of NO<sub>x</sub> and SO<sub>2</sub>, and short-term releases of NO<sub>x</sub>, as for each of these pollutants the PC did not screen out as insignificant, below 1 and 10% of the annual and short term CLeS respectively. In all cases, the PECs for these pollutants were below 70% of the annual mean CLe (even where the more precautionary CLe was used for SO<sub>2</sub>, assuming lichens are bryophytes are present). We are therefore satisfied that the annual mean CLeS are not at risk of exceedance. We are also satisfied that the limits case PEC of 32.6%, will not cause the short-term NO<sub>x</sub> CLe to be exceeded. No further assessment is required.

For Nitrogen Deposition, the highest Likely Case predicted PC occurring at Nant-y-Belan and Prynella Woods SSSI is 1.9% of the 10 kgN/ha/yr minimum CLo during normal operations. Under Limits case, the highest predicted PC occurring at the SSSI is 4.2% of the minimum CLo which again occurs in the normal operations scenario.

The APIS website shows that the maximum background nitrogen deposition at the SSSI already exceeds the lower CLo at 39.9 KgN/ha/yr and it is this background value we have used in our PEC calculations. (The applicant used the minimum background nitrogen deposition value in their assessment, which we do not agree with as this value applies only to a small proportion of the site, which is not necessarily the closest point to the Installation). When the predicted PCs above are added, the predicted PECs are 400.9% (normal operations, Likely Case) and 403.2% (normal operations, Limits Case).

We consider that even though the Likely and Limits Case PCs from Kronospan cannot be screened out as below the 1% significance threshold, they nevertheless represent a very small percentage of the PEC at the SSSI. The area surrounding the SSSI is predominantly rural, (although the western section is intersected by the A483 trunk road). and there are two large intensive farms to the north of the SSSI. Further investigation of the nitrogen sources using the APIS website (Sources ranked by total Nitrogen deposition (KgN/ha/yr) from combined UK sources - 2018 data), attributes the largest proportion of the background (approx. 40%) to Livestock Contributions, with the next largest contributory source being nitrogen deposition associated with releases carried over from Europe (22%). Emissions associated with road transport account for 5%. The existing background attributable to non-agricultural, non-abatable sources, (including industrial sources) is 0.75 KgN/ha/yr (total deposition) which is equivalent to 4.5%.

The applicant's air quality modelling is very conservative for the reasons described above in the **“Modelling Methodology and scenarios considered”** section above. However, we have decided to impose the Likely Case emission limit of 100 mg/m<sup>3</sup> NO<sub>x</sub> for emission points A29, A30 and A32 to ensure no likelihood of damage to the interest features of the SSSI.

The **Chirk Castle and Parkland / Castell Y Waun a'i Barcdir SSSI** is in close proximity to the installation boundary and as such, only PCs of daily mean HF can be screened out as insignificant. We have also used the Critical Load Function Tool on the APIS website to confirm that there will be no exceedance of the Critical Load function for acid deposition at the SSSI.

All other aerial pollutants have been further assessed in terms of the PECs. The results of this assessment concluded that annual releases of NO<sub>x</sub> and SO<sub>2</sub> are below 70% of the CLe. (The more precautionary CLe was used for SO<sub>2</sub>, assuming lichens are bryophytes are present). Also with a PEC of 18.72% of the weekly mean CLe for HF, we consider that an exceedance is unlikely.

The ambient background concentration for NH<sub>3</sub> at Chirk Castle SSSI is already exceeding the strictest CLe, used where lichens and bryophytes are present. Even

though the  $\text{NH}_3$  PC of  $0.019 \mu\text{g}/\text{m}^3$  from Kronospan cannot be screened out below 1% of the  $1 \mu\text{g}/\text{m}^3$  annual mean CLe, it nevertheless represents a very small percentage of the PEC at the SSSI. The area surrounding the SSSI is predominantly rural and further investigation of the source using the APIS website (Sources ranked by total Nitrogen deposition ( $\text{KgN}/\text{ha}/\text{yr}$ ) from combined UK sources - 2018 data), attributes the largest proportion of the background (40%) to Livestock Contributions, with the next largest contributory source being nitrogen deposition associated with releases carried over from Europe. The existing background attributable to non-agricultural, non-abatable sources, (including industrial sources) is  $0.65 \text{ KgN}/\text{ha}/\text{yr}$  (total deposition) which is equivalent to 4.2%.

The applicant's air quality modelling is very conservative for the reasons described above in the **"Modelling Methodology and scenarios considered"** section and the PC should also be considered in the context of the SSSI's proximity to Kronospan. Specifically, the prevailing wind direction in the UK is from the southwest. As Chirk Castle and Parkland SSSI is located to the southwest of the installation, under the prevailing wind conditions releases from the Kronospan site will be blown away from the SSSI in the opposite direction.

As ambient background levels of daily mean  $\text{NO}_x$  at the SSSI are approximately 10% of the daily mean CLe, most of the contribution at the site is predicted to come from Kronospan. However, we are satisfied that the daily mean CLe will not be exceeded under the highest Likely Case predictions, with a PEC of 55.6% of the  $\text{NO}_x$  daily mean CLe. As such, we have decided to impose the Likely Case emission limit of  $100 \text{ mg}/\text{m}^3$   $\text{NO}_x$  on emission points A29, A30 and A32 to ensure no likelihood of damage to the interest features of the SSSI.

For nitrogen deposition, the APIS website shows that the background nitrogen deposition at the SSSI already exceeds the lower CLo of  $10 \text{ KgN}/\text{ha}/\text{yr}$  at  $35 \text{ KgN}/\text{ha}/\text{yr}$ . Even though the Likely and Limits Case PCs from Kronospan cannot be screened out as below the 1% significance threshold, they nevertheless represent a small percentage of the PEC at the SSSI. The source attribution for background Nitrogen Deposition is the same as for  $\text{NH}_3$  above.

The applicant's air quality modelling is very conservative for the reasons described above in the **"Modelling Methodology and scenarios considered"** section and the PC should also be considered in the context of the SSSI's proximity to Kronospan. Specifically, the prevailing wind direction in the UK is from the southwest. As Chirk Castle and Parkland SSSI is located to the southwest of the installation, under the prevailing wind conditions releases from the Kronospan site will be blown away from the SSSI in the opposite direction.

However, we have decided to impose the Likely Case emission limit of 100 mg/m<sup>3</sup> NO<sub>x</sub> for emission points A29, A30 and A32 to ensure no likelihood of damage to the interest features of the SSSI.

For the other mechanisms of impact considered, we have reached a conclusion of no likelihood of damage to the bat population due to noise disturbance. This is because there is no significant change in the level or duration of noise associated with this variation application. The site has been operational 24/7 for over 4 decades and we therefore consider that the bats are accustomed to the industrial noise from the site.

For the potential smothering mechanism of impact, PM<sub>10</sub> & PM<sub>2.5</sub> Particulate Matter are deposited slowly but may travel 1000m or more. However, concentrations decrease rapidly on moving away from the source, due to dispersion and dilution. Chirk Castle SSSI is located approximately 480 metres to the southwest of the installation boundary, so there is potential for deposition of Particulate Matter on the SSSI. However, particulate emissions from the site are comprised mainly of wood dust from the process, which is biodegradable and will decompose naturally. In addition, the prevailing wind direction in the UK is from the southwest. As Chirk Castle and Parkland SSSI is located to the southwest of the installation, under the prevailing wind conditions releases from the Kronospan site are blown away from the SSSI in the opposite direction. As such, we are satisfied that there is no likelihood of damage to the interest features from the potential deposition of wood dust.

Finally, there are no significant changes in storage of materials associated with this variation application that could be deemed detrimental to any of the features of the SSSI.

In summary, we are satisfied that the aerial releases from the installation are not likely to damage any of the interest features of the three SSSIs we have assessed. The tightened NO<sub>x</sub> ELV of 100 mg/m<sup>3</sup> we have imposed on emission points A29, A30 and A32, will also help to minimise nitrogen deposition at Chirk Castle SSSI and Nant-Y-Belan and Prynella Woods.

The conclusion of this assessment must also be viewed in the wider context (as described in the Background to the Variation section above). Prior to NRW becoming the single regulator for the site, we are ensuring that the impact of the whole factory on surrounding protected sites is assessed. The outcome of our assessment will set the baseline against which further measurable regulatory improvements can be implemented in future.

Further variation work will follow this application, in that NRW need to assess Kronospan's compliance against three further European best practice guidance documents, specifically: Production of Large Volume Organic Chemicals, Common Wastewater and Gas Treatment/Management Systems in the Chemical Sector and Waste Incineration. Regarding the latter, it is also worth noting that one of the site waste wood co-incinerators has had a complete rebuild since the modelling was provided for this application and we are therefore expecting improved emissions performance when we review the permit against the Waste Incineration best practice document.

Other longer-term improvements at the site can be examined and prioritised once NRW takes on full regulatory control of the site. This may include the targeting of specific pollutants where required and achieving improvements in operator techniques and technology used.

Separate to the site, further reductions in NO<sub>x</sub> in the atmosphere are expected due to the gradual change in the transport fleet to electric (sale of new petrol and diesel cars banned from 2030).

We have consulted with the conservation body in Wales on our assessment of SSSIs listed above. We also consulted with Natural England on our assessment for the River

Dee SSSI. The conservation body in Wales and Natural England are in agreement with our conclusions.

### Non-statutory sites Assessment

For non-statutory sites, Natural Resources Wales impact assessment criteria considers whether or not an installation can cause significant pollution alone. If the process contribution from an installation is less than 100% of the relevant critical level or load for a site, we consider that no significant pollution will be caused, provided that the Applicant is using BAT to control emissions.

Canal Wood is a Restored Ancient Woodland and Local Wildlife Site, and is the closest non-statutory site to the habitats search point, lying approximately 120 metres from the search point and adjacent to the western installation boundary. The nearest plantation on ancient woodland (Reservoir Wood) is approximately 700 metres to the south-west of the search point. The nearest semi-natural ancient woodland (Mynattyn Wood) is located approximately 720 metres to the west of the search point. Barracks Field Local Wildlife Site is approximately 1.69 km to the northeast of the search point.

The applicant has modelled the predicted Process Contributions (PCs) at each of the non-statutory sites. As the predicted PCs for NO<sub>x</sub> releases decline quickly with distance from the source, this assessment focuses on predicted PCs at Canal Wood where maximum predicted PCs will be seen. As such, it follows that if predicted PCs are less than 100% of the relevant Critical Level and Loads at the closest non-statutory sites, they can be expected to be even less at those non-statutory sites which are further from the release sources.

### Critical levels for nitrogen oxides (as NO<sub>2</sub>) (NO<sub>x</sub>)

We are satisfied that the 30 µg/m<sup>3</sup> annual mean CLe for NO<sub>x</sub> will not be exceeded at any of the non-statutory sites under both normal operations and operations where MDF2 is offline in both the Likely and Limits Cases. The highest predicted PC is 70.3% of annual mean NO<sub>x</sub> at Canal Wood LWS, based on our own check modelling. This is predicted to occur when MDF 2 is offline under the Limits Case.

Our check modelling assessment of the predicted PCs associated with the 75  $\mu\text{g}/\text{m}^3$  daily mean CLe for  $\text{NO}_x$  shows likely exceedance at Canal Wood LWS under both normal operations and operations where MDF2 is offline under the Limits Case, with a predicted PC of 155.7% of the daily mean CLe. However, we are satisfied that no exceedance will occur under the more realistic Likely Case, in which the maximum predicted PC at Canal Wood LWS is 62.3% of the daily mean CLe, under both normal operations and when MDF2 is Offline. No exceedance of the daily mean CLe for  $\text{NO}_x$  is predicted for Barracks Field LWS.

#### Sulphur dioxide ( $\text{SO}_2$ ) (annual CLe)

We are satisfied that the relevant Critical Level of 10  $\mu\text{g}/\text{m}^3$  for  $\text{SO}_2$  (where lichens and bryophytes are present) will not be exceeded at any of the non-statutory sites under both normal operations and operations where MDF2 is offline. The highest predicted PC equates to 12.6% of the annual CLe at Canal Wood LWS. This is predicted to occur when MDF2 is offline.

#### Ammonia ( $\text{NH}_3$ ) (annual CLe)

We are satisfied that the relevant Critical Level of 1  $\mu\text{g}/\text{m}^3$  for  $\text{NH}_3$  (where lichens and bryophytes are present) will not be exceeded at any of the non-statutory sites under both normal operations and operations where MDF2 is offline. The highest predicted PC equates to 3.2% of the annual CLe at Canal Wood LWS. This is predicted to occur both under normal operations and when MDF2 is offline.

#### Hydrogen Fluoride HF (weekly mean CLe)

We are satisfied that the HF weekly mean CLe of 0.5  $\mu\text{g}/\text{m}^3$  will not be exceeded at any of the non-statutory sites under both normal operations and operations where MDF2 is offline. The highest predicted PC equates to 12% of the weekly mean CLe at Canal Wood LWS. This is predicted to occur when MDF2 is offline.

#### Hydrogen Fluoride HF (daily mean CLe)

We are satisfied that the HF daily mean CLe of 5  $\mu\text{g}/\text{m}^3$  will not be exceeded at any of the non-statutory sites under both normal operations and operations where MDF2 is offline. The highest predicted PC equates to 4.6% of the daily mean CLe at Canal Wood LWS and the nearest Ancient Woodland site. This is predicted to occur at both

sites when MDF2 is offline. Conversely, the highest predicted PC at Barracks Field LWS is <1% under both normal operations and the MDF2 offline scenario. We can therefore conclude that impacts of HF at this particular site are insignificant, when compared to the daily mean CLe.

#### Critical Loads for Nutrient Nitrogen Deposition

We consider that the most appropriate CLo for nutrient nitrogen deposition are as follows:

- Restored and Semi-Natural Woodland = 10 – 20 Kg/N/ha/yr
- Barracks Field LWS (semi-improved grassland) = 30 Kg/N/ha/yr

The applicant has used the CLo range of 10 – 20 Kg/N/ha/yr (Fagus woodland), for their assessment for Canal Wood LWS and other Ancient Woodland sites. They have used a CLo range of 20 – 30 Kg/N/ha/yr (low and medium altitude hay meadows) for their assessment of Barracks Field LWS. We consider that the ranges used are sufficiently precautionary.

The highest PC for nutrient nitrogen deposition at Canal Wood LWS is approximately 35% of the lower CLo of 10 Kg/N/ha/yr, which occurs during the Limits Case under normal operations. The highest PC occurring at Barracks Field LWS is approximately 5% of the lower CLo of 20 Kg/N/ha/yr, which is predicted to occur for the Likely Case under normal operations. We are therefore satisfied that significant pollution due to nitrogen deposition will not occur at any of the non-statutory sites.

#### Critical Loads for Acid Deposition

We consider that the most appropriate CLo for acid deposition at Barracks Field LWS are for neutral grassland (CLmaxS 4, CLminN 1.071, CLmaxN 5.071). These CLo are the same as those used by the applicant for Calcareous grassland. The highest predicted PC at Barracks Field LWS is 2.6% of the CLo which occurs under the Likely Case when MDF2 is Offline.

The most appropriate CLo for acid deposition at Canal Wood LWS are for broad-leaved / coniferous unmanaged woodland (CLmaxS 1.722, CLminN, 0.142, CLmaxN

1.864), as used by the applicant. The highest predicted PC according to our check modelling is approximately 27.4% of the CLo and occurs when MDF2 is offline under the Limits Case.

#### Summary of non-statutory sites Assessment

All non-statutory sites are below 100% of the respective CLes and CLoS for annual NO<sub>x</sub>, SO<sub>2</sub>, NH<sub>3</sub>, daily and weekly mean HF, nutrient nitrogen and acid deposition. In addition, Barracks Field LWS is below 100% of the daily mean NO<sub>x</sub> CLe. We are therefore satisfied that significant pollution will not be caused at these sites in terms of these pollutants.

We consider that the CLe for daily mean NO<sub>x</sub> is likely to be exceeded at Canal wood LWS under the applicant's modelled "Limits Case" which assumes that the driers are emitting via emission points A29, A30 and A32 at the BAT-AEL emissions benchmark of 250mg/m<sup>3</sup> NO<sub>x</sub> 100% of the time. However, Kronospan have also provided a more realistic "Likely Case" model, which is based on the same driers emitting NO<sub>x</sub> at 100 mg/m<sup>3</sup>, derived from process monitoring data.

We are satisfied that significant pollution at Canal Wood LWS will not be caused by operations at the Likely Case Limit of 100 mg/m<sup>3</sup>. Specifically, predicted maximum releases at this level are 62.3% of the CLe under both normal operation and operations when MDF2 is offline at Canal Wood LWS. As such, we have decided to impose an emission limit of 100 mg/m<sup>3</sup> NO<sub>x</sub> for emission points A29, A30 and A32. This requires the operator to go beyond BAT to avoid causing significant pollution at these sites.

## **7. Application of Best Available Techniques**

We have performed a statutory review of the operator's particleboard and MDF manufacturing processes and associated plant against the BAT Conclusions for the Production of Wood-based Panels. The outcome of this review is summarised in Annex 2 of this document and we are satisfied that the operator is compliant with the published BAT conclusions which apply from 24 November 2019.

We have not reviewed other currently permitted processes against BAT as part of this variation, as the fact they have been permitted prior to this variation, means they

should have already been assessed. However, we will be undertaking future NRW-led variation work to assess compliance against the following BREFs:

- (i) Large Volume Organic Chemicals – for formaldehyde and resin manufacture on site
- (ii) Common Waste Water and Waste Gas Treatment/Management Systems within the Chemical Industry – to include a review of surface water and effluent collection, treatment and discharge.
- (iii) Waste Incineration – for operation of K7 and K8 Biomass Plants and combustion of process dust in dryers.

We have updated the permit as a result of our statutory review against the Production of Wood-Based Panels BREF and BAT Conclusions, and we are confident that the new requirements will deliver a superior level of protection to that which was previously achieved. In particular, we have tightened a number of emission limits to ensure compliance with the BAT Conclusions. This is discussed in more detail in the Emission Limits section of this document.

We have also imposed improvement condition NRW IC29 which requires the Operator to provide a written report demonstrating how optimum operation of the new WESP21 is achieved. This will then be incorporated into Table S1.2 of the permit as an operating technique. This condition has been imposed, because the WCBC permit contained a number of conditions relating to the operation of WESP 32, that were in effect stipulated operating techniques. We want to get similar operating techniques in place for WESP21, which will be incorporated into the permit through the operating techniques table, rather than the permit conditions and therefore be enforceable in that way.

The Production of Wood-based panels BREF and its BAT-AELs have provided the opportunity to consider further environmental improvements at the site. We believe this variation provides a sound basis for ongoing regulation of the installation.

## 7.1 Other Emissions to the Environment

### 7.1.1 Emissions to water

There are no point source emissions of process water to surface water, ground or groundwater associated with this variation and no process changes within the installation that impact upon current permitted discharges. Based upon the information in Annex 2, we are satisfied that the appropriate measures are in place to prevent pollution of ground and surface water. However, this aspect of the site's operations will be reviewed in future as part of our NRW-led statutory review of compliance against the Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Industry BREF.

### 7.1.2 Emissions to sewer

There are no process changes within the installation that impact upon current permitted discharges to sewer in Table S3.6. However the Operator has been undertaking some work to re-zone releases to sewer across the installation, which will be reflected in the necessary trade effluent discharge consents from Dŵr Cymru Welsh Water. On this basis, we have set improvement condition NRW IC 43 which requires the operator to provide revised copies of the Dŵr Cymru Welsh Water Trade Effluent Consents for emission points S1, S2, S3 and S4 listed in Table S3.6 of this Permit. The revised consents are required for record-keeping purposes following the zoning and redesign of the installation's trade effluent drainage system.

Based upon the information in Annex 2, we are satisfied that the appropriate measures are in place to prevent and / or minimise emissions to sewer. However, this aspect of the site's operations will be reviewed in future as part of our NRW-led statutory review of compliance against the Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Industry BREF.

### **7.1.3 Fugitive emissions**

Based upon the information in Annex 2, we are satisfied that the appropriate measures are in place to prevent and / or minimise fugitive emissions, including dust.

However, we have imposed two improvement conditions, NRW IC38 and NRW IC41 requiring the operator to update and submit written dust and emissions management plans respectively. The updated plans will need to be written in accordance with current guidance and reflect BAT for the installation, already outlined in Annex 2, together with any updates that have been made since the comparison against the wood-based panels BAT Conclusions was submitted. The updated plans will then be incorporated into the permit as part of Table S1.2 Operating Techniques and will therefore be directly enforceable.

We consider that permit conditions 3.2.1 to 3.2.3 are protective going forward. In addition, we have transferred bespoke conditions from the WCBC permit to ensure that wind-blown particulates and external dust from stockpiles continues to be minimised. These are specifically conditions 2.3.2, 2.3.3 and 2.3.4 in the consolidated permit. We are satisfied that above measures form a good basis upon which further regulatory improvements can be made in future.

### **7.1.4 Noise and vibration**

The current variation, included a noise modelling assessment of the changes introduced by planning consent since October 2014. These are primarily the new RCF facility, Chip Wash pre-heating plant, Wood Chip Preparation Building and Chip dryer venting to WESP 21 and extension to melamine press hall. The addition of cladding to existing buildings are other improvements which have been made the intervening years, which haven't been specifically assessed by the modelling. In summary, we have reviewed the noise modelling and we consider that noise impacts will not change significantly as a result of this variation. This is in part due to improvements that have been made e.g. new wood chip preparation building is now enclosed rather than open sided.

However, we have imposed improvement condition NRW IC40 requiring the operator to update and submit a written noise management plan. The updated plan will need to

be written in accordance with current guidance and reflect BAT for the installation, already outlined in Annex 2, together with any updates that have been made since the comparison against the wood-based panels BAT Conclusions was submitted. The updated plan will then be incorporated into the permit as part of Table S1.2 Operating Techniques and will be directly enforceable.

We consider that permit conditions 3.4.1 to 3.4.2 are protective going forward. In addition, we have transferred a bespoke conditions from the WCBC permit limiting the hours of testing of emergency generators, alarms, sirens and relief valves to ensure that this continues to be observed. This is specifically condition 3.4.3 in the consolidated permit. We are satisfied that above measures form a good basis upon which further regulatory improvements can be made in future.

We are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise noise and vibration and to prevent pollution from noise and vibration outside the site.

#### **7.1.5 Odour**

Based upon the information Annex 2, we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise odour and to prevent pollution from odour.

However, we have imposed an improvement condition, NRW IC39 requiring the operator to update and submit a written odour management plan. The updated plan will need to be written in accordance with current guidance and reflect BAT for the installation, already outlined in Annex 2, together with any updates that have been made since the comparison against the wood-based panels BAT Conclusions was submitted. The updated plan will then be incorporated into the permit as part of Table S1.2 Operating Techniques and will therefore be directly enforceable.

We consider that permit conditions 3.3.1 to 3.3.2 are sufficiently protective going forward and form a good basis upon which further regulatory improvements can be made.

## 7.2 Setting ELVs and other Permit conditions

### 7.2.1 Translating BAT into Permit conditions

Article 14(3) of IED states that BAT conclusions shall be the reference for permit conditions. Article 15(3) further requires that under normal operating conditions; emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions.

We have decided that emission limits should be set for the parameters listed in the permit. As part of this permit variation and consolidation, we have:

- (i) Transferred existing emission limit values (ELVs) from the WCBC permit into the NRW permit;
- (ii) Set ELVs for new plant, specifically Chip Dryer No. 4 and WESP 21 (Chip Dryer No. 4 emits through WESP 21);
- (iii) Tightened NO<sub>x</sub> emission limits on the three main process emission points (MDF 1 and 2 cyclones and WESP 21) to ensure that nearby habitats sites are protected. The stricter emission limit we have imposed has benefits for human health as well.
- (iv) Reviewed emission limits to ensure they reflect the BAT-AELs in the Wood-based Panels BAT Conclusions and that no “backsliding” occurs.

This section of our decision should be read in conjunction with the permit. The remainder of this section reviews the tables for releases to air (Tables S3.1, S3.2, S3.3 and S3.4), releases to water (Table S3.5) and releases to sewer (Table S3.6) and summarises the changes we have made to each.

#### CO<sub>2</sub> emission limit values

CO<sub>2</sub> is an inevitable product of the combustion of waste. The amount of CO<sub>2</sub> emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an emission limit value for CO<sub>2</sub>, which could do no more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under Annex II of IED, which lists the main polluting substances that are to

be considered when setting emission limit values (ELVs) in Permits. Provided energy is recovered efficiently (see section 4.3.6 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO<sub>2</sub> emissions.

#### Table S3.1: Chemical Manufacturing Plant Emission Limits & Monitoring

There are no changes to the requirements for emission points A2 – A4, A7 – A9, A11, and A13 – A15 as a result of this variation. These are recognised point sources, but no emission limits and monitoring is required because they are mainly storage tanks / silos and pressure relief vents.

The Operator has informed us that air emission points A10 and A12 are no longer in use. These are now described in the permit as “redundant emission points”. Emission point A10 was previously labelled as “Dust Filter for Melamine Hopper feeding Reactor R210 and R220” and A11 was previously labelled “Dust filter for Melamine Hopper feeding Reactor 4”. These emission points were associated with melamine bulk bag discharging facilities and the method of introducing melamine into the formaldehyde plant has since been replaced with a melamine silo, which is filled by tanker delivery. As such, these emission points no longer release to atmosphere, but feed directly back into the hopper.

For emission point A1, we have updated the required monitoring standard for formaldehyde to the new CEN standard CEN/TS 17638:2021 “Stationary Source Emissions – Manual Method for the Determination of the Mass Concentration of Formaldehyde”. **This update applies to all emission points in the permit where formaldehyde is required to be monitored.** The new standard which was published in June 2021 replaces the interim method of formaldehyde monitoring specified in the Wood-based panels BAT Conclusions. The new test method will provide a more accurate representation of how much formaldehyde is being released to air. Four different methods of testing are available within the standard, so we have imposed

that they use a method from this standard by 1 January 2024 which requires the Operator to review each method and confirm which is the most appropriate for use for compliance monitoring, based factors such as the ranges of formaldehyde likely to be encountered and the limit of detection.

We have tightened emission limits for Total Volatile Organic Compounds (TVOC) to ensure compliance with the upper end of the wood-based panels BAT-AEL range. These changes are summarised in the table below:

Emission Point	Source	Parameter	ELV to Draft/2022	ELV from Draft/2022
A5	NAIRB Wet Scrubber – Resin VITS 3, 5, Paper Impregnation Plant	TVOC	50 mg/m <sup>3</sup>	30 mg/m <sup>3</sup>
A6	NAIRB Wet Scrubber – Resin VITS 4 Paper Impregnation Plant	TVOC	50 mg/m <sup>3</sup>	30 mg/m <sup>3</sup>

In addition we have changed the “Total VOC (as carbon) Class B” parameter required in the WCBC permit to TVOC for consistency with the wood-based panels BAT Conclusions. We have also updated the monitoring reference period and monitoring frequency to ensure they are aligned to the BAT Conclusion requirements for Paper Impregnation Ovens and the TVOC test method has also been updated to EN 12619 to reflect the BAT Conclusions.

#### Table S3.2: Gas Fired Combustion Plant Emission Limits & Monitoring

The description for emission points A17 and A18 have been updated from “Thermal Oil Heater” to “Gas Heater”. There are no other changes to any of the requirements for these emission points. There are also no changes to any of the emission limits or monitoring requirements for emission points A19 – A25.

We have relaxed the emission limit for NO<sub>x</sub> on emission point A16 from 90 mg/m<sup>3</sup> to 200 mg/m<sup>3</sup> at the request of the Operator. This change is summarised in the table below:

<b>Emission Point</b>	<b>Source</b>	<b>Parameter</b>	<b>ELV to 3/10/2022</b>	<b>ELV from 4/10/2022</b>
A16	K1 Kronoplus Press and Space Heating	Oxides of nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )	90 mg/m <sup>3</sup>	200 mg/m <sup>3</sup>

Kronospan cannot meet the 90 mg/m<sup>3</sup> for K1 as they made an error in their original calculations and as such requested an original emission limit that was too low. K1 was remodelled at 200 mg/m<sup>3</sup> in the updated Fichtner modelling report (dated 15/12/22) and as K1 is the smallest NO<sub>x</sub> contributor of all the combustion plant assessed (and therefore poses a low environmental risk) we consider that the new ELV of 200 mg/m<sup>3</sup> is realistic and sufficiently protective of human health and ecological receptors. The new ELV is tighter than the 250 mg/m<sup>3</sup> required for existing MCP between 1 and 5 MWth thermal input and the annual monitoring requirement for K1 also goes beyond the minimum 3 yearly frequency required by the MCPD. We are satisfied that this represents BAT for the installation.

#### Table S3.3: Biomass Boiler Emission Limits & Monitoring

We have imposed new emission limits on emission point A26, which is the dedicated stack for K7 Biomass Boiler. This has been done for consistency with the regulatory approach used for K8 Biomass Boiler. Although, it should be noted that under normal conditions, K7 Biomass Boiler combustion gases are released through the MDF2 Cyclones (emission point A29), which is where emission limits were imposed in the WCBC permit and this is still reflected in the emission limits for A29.

As K7 Biomass Boiler is not subject to Chapter IV of IED, the operator has proposed ELVs based on the emission benchmarks for burning solid biomass fuel in Local Authority Process Guidance Note 1/03 (12) “Statutory Guidance for Boilers and Furnaces 20 – 50MW thermal input”. We have imposed emission limits for NO<sub>x</sub>, PM and SO<sub>2</sub> which match the emission benchmarks in the Local Authority Process Guidance Note.

The guidance does not contain an absolute limit for carbon monoxide (CO), but states that 150 mg/m<sup>3</sup> should be taken as indicative of what is achievable. We have therefore set an emission limit of 150 mg/m<sup>3</sup> for CO releases from K7. We have also set

improvement condition NRW IC37 requiring the Operator to investigate the likely cause of high CO releases from K7 Biomass Boiler and submit a written report identifying the key causes and outlining proposals to reduce the CO release from K7 Biomass Plant, with associated timescales for implementation.

We have not imposed any additional monitoring requirements, to those Local Authority Process Guidance Note 1/03 (12) “Statutory Guidance for Boilers and Furnaces 20 – 50MW thermal input, on K7 Biomass Boiler as part of this variation. The outcome of NRW IC37 will be reviewed and the regulation of K7 Biomass Boiler together with the need for any additional emission limits and monitoring requirements will be assessed as part of our forthcoming NRW-led statutory review against the Waste Incineration BAT Conclusions.

We removed the half-hourly average ELVs from emission point A27 (K8 Biomass Boiler), as the environmental impact of emitting at these short-term emission levels has not been considered in the Fichtner consolidated air quality modelling report. The parameters affected are: PM, Total Organic Carbon (TOC), Hydrogen Chloride (HCl), CO, NO<sub>x</sub>, and NH<sub>3</sub>. (See section on the [Impact of Abnormal Operation of K8 IED Chapter IV Waste Wood Biomass Plant 6.2.4](#) above).

There are no other changes to the emission limits associated with K8 Biomass Boiler as a result of this variation. We note that K8 Biomass Boiler has been modernised via a rebuild since the variation application was submitted in 2018. The operation of K8 will be reviewed as part of our forthcoming NRW-led statutory review against the Waste Incineration BAT Conclusions.

#### Table S3.4: Board Manufacturing Plant Emission Limits & Monitoring

The emission points in table S3.4 are all directly connected to our review of the wood-based panels BAT Conclusions, as they are the main sources of emissions from the production processes. The table below shows how we have tightened emission limits to ensure compliance with the BAT-AEL ranges in the wood panels BAT Conclusions. The parameters in bold text are those where we have tightened emission limits and

require the Operator to go beyond BAT for the protection of ecological receptors and human health. (See [Biodiversity, Heritage, Landscape and Nature Conservation](#) section above).

Emission Point	Source	Parameter	ELV to Draft/2022	ELV from Draft/2022
A28	WESP 32 Unit Stack: (emissions from particleboard and MDF Press abatement system – 3 lines)	Particulate Matter	20 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>
		Total Volatile Organic Compounds	130 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A29	MDF 2 Dryer (open cyclones x 4)	Total Volatile Organic Compounds	130 mg/m <sup>3</sup>	120 mg/m <sup>3</sup>
		Formaldehyde	20 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>
		Oxides of nitrogen (NO & NO <sub>2</sub> expressed as NO <sub>2</sub> )	500 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A30	MDF 1 Dryer Cyclones x 2	Total Volatile Organic Compounds	130 mg/m <sup>3</sup>	120 mg/m <sup>3</sup>
		Formaldehyde	20 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>
A31	MDF 1, MDF 2 and Particleboard Controll / combined press abatement system stack	Particulate Matter	20 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>
		Total Volatile Organic Compounds	130 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A32	WESP 21 Unit Stack (Chip Dryer No. 4 and exhaust from Particleboard)	Total Volatile Organic Compounds	200 mg/m <sup>3</sup>	130 mg/m <sup>3</sup>
		Formaldehyde	20 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
B01 – B04, B05 – B06, B07 – B31	All Particulate Filtration Plant (bag filters and MDF recycle cyclones)	Particulate Matter (all contained sources for MDF)	20 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
		Particulate Matter (all other contained sources)	50 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>

NB/ B05-06 all referenced material provided by the operator prior to date for the MDF recycle cyclone filter boxes are referenced with prefix C, including Schedule 7b.

### Summary of other changes

We have updated the name of **emission point A28** to “WESP 32”. This was previously known as the SEKA WESP in the WCBC permit. Since WESP 21 (emission point A32 has been commissioned) particleboard dryers BAB 2 and 3 have been mothballed (noted against emission points A34 and A35) and gases from particleboard manufacturing are now released via WESP 21, instead of WESP 32. WESP 32, now only takes releases from the particleboard and MDF press abatement system, so the parameters required to be monitored have been narrowed down, so that they are relevant to releases from the press only. (e.g. the wood-based panels BAT conclusions

do not require NO<sub>x</sub> measurement for press abatement gases, so the existing NO<sub>x</sub> ELV of 250 mg/m<sup>3</sup> has been removed).

We have updated the “Condensable VOCs” parameter to “Total Volatile Organic Compounds” (TVOC) **for all relevant emission points**, to ensure consistency with the wood-based panels BAT Conclusions. Finally, we have removed the parameter “Total Aldehydes” **for all relevant emission points**, to modernise the permit and ensure it aligns with the wood-based panel BAT Conclusions. Formaldehyde is still required to be monitored as a separate parameter, but Total Aldehydes will be reflected in the TVOC monitoring result. We are satisfied with this approach given that the Production of Wood-based Panels BREF states that:

“The main constituents of the volatile organic fraction in wood are generally not considered in literature as possessing toxic properties. An exception is formaldehyde.”

**For emission point A29**, we have updated the required test methods and where appropriate, reference periods for TVOC, PM, NO<sub>x</sub>, HCl, and Hydrogen Fluoride (HF) to ensure compliance with the BAT Conclusions.

There is no change to the ELV for PM, as this is compliant with top end of BAT-AEL range.

We have added the following new parameters with associated monitoring requirements: Mercury (Hg), Group 3 Metals (Antimony, Arsenic, Cadmium, Cobalt, Chromium, Copper, Manganese, Nickel, Lead, Thallium & Vanadium) and Dioxins and Furans (Polychlorinated dibenzo-dioxins and -furans). These monitoring requirements apply if contaminated recovered wood is used as a fuel as per the Wood-based Panels BAT Conclusions. As K7 Biomass Boiler exhausts via the MDF2 Cyclones during normal operation, the results of any monitoring will also help to inform our forthcoming review of the regulation of K7 Biomass Boiler against the Waste Incineration BAT Conclusions. The monitoring of Ammonia (NH<sub>3</sub>) is also a new requirement in line with Wood-based Panels BAT Conclusions. However this is only required during the MDF 1 Offline operating scenario, as that is when the K8 Biomass Boiler (and associated SNCR plant which is the source of ammonia), is vented via MDF2 Cyclones (A29).

We have removed the 350 mg/m<sup>3</sup> ELV for SO<sub>2</sub> on emission point A29, as the Wood-based Panels BAT Conclusions dictate that this parameter is not required where the main fuel source is wood and gas, which applies in this case. We are satisfied the SO<sub>2</sub> releases are adequately controlled at source via tighter ELVs on K7 and K8 Biomass Plant dedicated stacks (A26 and A27). We have also removed the Hydrogen Cyanide ELV and monitoring requirement that previously appeared for emission point A29 in the WCBC permit. This parameter is not required by the wood-based panel BATC conclusions and is not expected to form a component of releases to air from the installation, as it should not be in any of the permitted source material. We are satisfied that Kronospan's permitted waste acceptance codes in Tables S2.2, S2.3 and S2.4 of the permit and waste management procedures will be sufficient in preventing this type of waste from entering the installation.

**For emission point A30**, we have updated the required test methods for PM in line with the Wood-based panel BAT Conclusions. There is no change to the ELV for PM though, as this is already compliant with top end of BAT-AEL range.

We have added the following new parameters with associated monitoring requirements: Hydrogen Chloride (HCl), Hydrogen Fluoride (HF), Mercury (Hg), Group 3 Metals (Antimony, Arsenic, Cadmium, Cobalt, Chromium, Copper, Manganese, Nickel, Lead, Thallium & Vanadium) and Dioxins and Furans (Polychlorinated dibenzodioxins and -furans). These monitoring requirements apply if contaminated recovered wood is used as a fuel as per the Wood-based Panels BAT Conclusions. This is applicable under normal operations, as K8 Biomass Boiler exhausts via the MDF1 Cyclones. The monitoring of Ammonia (NH<sub>3</sub>) is also a new requirement in line with Wood-based Panels BAT Conclusions and is associated with K8 Biomass Boiler's SNCR plant which is the source of ammonia.

We have also imposed a new ELV and monitoring requirement for NO<sub>x</sub> in line with the wood-based panels BAT Conclusions. However the emission limit we have set of 100 mg/m<sup>3</sup> is lower than the 250 mg/m<sup>3</sup> top end of the BAT-AEL range, as a stricter limit is necessary for the protection of nearby ecological receptors.

We have updated the name of **emission point A31** to “MDF 1, MDF 2 and Particleboard Controll / combined press abatement system stack”. This was previously known as “MDF1, MDF2 and Particleboard Controll combined” in the WCBC permit. Emission point A31 is used as the monitoring and compliance point for the release of press abatement gases.

**Emission point A32** is the release point for the new Chip Dryer No. 4 and WESP 21. As releases from the Particleboard production process now emit through this emission point, we have shown in the table above how we have tightened the relevant emission limits from when Particleboard released to the SEKA WESP as part of the WCBC permit.

We have updated the required test method for PM in line with the Wood-based panel BAT Conclusions. There is no change to the ELV for PM though, as this is already compliant with top end of BAT-AEL range.

We have added the following new parameters: NO<sub>x</sub>, CO, HCl, HF, SO<sub>2</sub>, Hg, Group 3 metals and dioxins and furans. These are new requirements needed as a result of the operation of Chip Dryer No. 4 (NO<sub>x</sub>). Monitoring of HCl, HF, SO<sub>2</sub>, Hg and Group 3 metals and dioxins and furans are required for particleboard where contaminated recovered wood may be used, which is relevant to both the waste codes permitted for acceptance into the particleboard process and the fact that Chip Dryer No. 4 can run on wood dust. The results of any monitoring will help to inform our forthcoming review of this Dryer against the Waste Incineration BAT Conclusions.

We have imposed an ELV of 100 mg/m<sup>3</sup> for NO<sub>x</sub> on emission point A32 to minimise releases from the new Chip Dryer No. 4. This ELV is lower than the 250 mg/m<sup>3</sup> top end of the BAT-AEL range, as a stricter limit is necessary for the protection of nearby ecological receptors. Finally, we have added a footnote to the table to explain that a formaldehyde ELV of up to 15 mg/m<sup>3</sup> is allowed when >85% recovered wood is being used in the particleboard production process.

**Emission point A33** is the Dryer No. 4 WESP 21 Particleboard Emergency Stack. We have not imposed ELVs or monitoring requirements on this emission point because it is not used under normal operating scenarios. Instead it's use is related to permit condition 4.3.5 which requires Chip Dryer No. 4 and / or WESP 21 and associated plant operation to be terminated as soon as is reasonably practicable, in the event of malfunction, in which case releases would temporarily emit via emission point A33.

**Emission points B01 – B04, B05 – B06, B07 – B31** (i.e. all bag filtration plant and MDF recycle cyclones (NB/ all referenced material provided by the operator prior to date for the MDF recycle cyclone filter boxes are referenced with prefix C, including Schedule 7b)) had two different PM ELVs in the WCBC permit. These were 20 mg/m<sup>3</sup> for all abatement plant associated with contained sources of MDF production and 50 mg/m<sup>3</sup> for all other contained sources. This differentiation has been removed by the wood-based panels BAT Conclusions and a single ELV of 5 mg/m<sup>3</sup> for particulate matter now applies for all sources. We have tightened the ELV accordingly as shown in the table above. We require compliance monitoring of these emission points on a quarterly basis, with daily compliance being ensured through the continuous process monitoring specified in Table S3.8 of the Permit.

Table S3.5: Point Source Emissions to Water - Emission Limits & Monitoring

We have set an ELV for Total Suspended Solids (TSS) in line with the wood-based panels BAT-AEL. The ELV is 40 mg/l, expressed as the average of samples collected over one year. This is additional to the existing TSS ELV of 100 mg/l which applies daily when discharging via W1.

We have relaxed the ELVs for ammonia and formaldehyde at W1 to the levels originally permitted by NRW in 2004, as per the table below:

<b>Emission Point</b>	<b>Source</b>	<b>Parameter</b>	<b>ELV to Draft/2022</b>	<b>ELV from Draft/2022</b>
W1		Ammonia	3.5 mg/l	5 mg/l

	Discharge from Surface Water Lagoons via Penstock A to Afon Bradley	Formaldehyde	1.5 mg/l	2 mg/l
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This change formalises a written agreement with NRW, following our review of findings from the Operator's completion of NRW IC4. The targeted reduction in ammonia and formaldehyde was investigated, but not feasible at the time of completion of the IC. However, the discharge to the Afon Bradley via W1 will be reviewed again in future as part of an NRW-led statutory review against the Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Industry BREF.

Table S3.6: Point Source Emission to Sewer – Emission Limits and Monitoring

There are no changes to the ELVs and monitoring requirements in this table as a result of the variation.

In summary, it is considered that the ELVs described above will ensure that significant pollution of the environment is prevented and a high level of protection for the environment secured.

### 7.2.2 Use of conditions other than those from the template

Throughout this document we have described any site-specific conditions that have been retained from the WCBC permit, where appropriate.

We also consider that we need to impose conditions other than those in our permit template, which specifically address record-keeping and notification requirements associated with any malfunction of Chip Dryer No. 4, WESP 21 unit and associated plant operation. These are permit conditions 4.1.3, 4.1.4 and 4.3.3.

As WESP 21 has been permitted as part of this variation, we have imposed NRW IC29. This requires the Operator to provide a written report to demonstrate how optimum operation of WESP 21 is achieved. The written report shall include the supplier performance guarantee for the WESP. The written report will be incorporated

into Table S1.2 of this permit as existing operating techniques and is therefore enforceable.

### 7.2.3 Pre-operational conditions

We have not set any new pre-operational conditions as a result of this variation.

The Operator requested a pre-operational condition requiring them to notify NRW in the event that containerised engines are brought onto site temporarily, in the event that the gas engines are not available for limited periods. We are refusing this pre-operational condition because a new combustion plant brought onto site would need to be subject to human health and ecological assessment first. This would likely require additional air dispersion modelling and a separate permit variation.

### 7.2.4 Other Improvement Conditions

Throughout this document we have described any new improvement conditions that we have considered it necessary to impose in the relevant section.

In addition, we have imposed NRW IC24, which requires the Operator to provide a written report for emission point A33, describing all the process conditions that trigger the need to use each stack and the expected duration of each type of release. The report shall also provide the frequency of each process occurrence per stack, for each of the calendar years 2017 – 2021 inclusive. The report shall also provide justification of why use of these emission points is necessary, together with a feasibility assessment of any alternative operating techniques that have been considered.

This IC is necessary to understand when these emission plants are used ,how often and for how long. When releases are emitted via A33, they are unabated and hence these emission points are not used under normal operation. The purpose of the IC is to minimise the use of these emission points and therefore the release of unabated emissions from the particleboard process and presses.

WCBC confirmed via email dated 01/02/19 that WCBC improvement conditions WCBC 4, 5, 6, 11, 12, 13 are complete. This is reflected in Table S1.3 of the permit. Although WCBC IC11 has been completed, WCBC's email explains that the

conclusion was that de-pluming of WESP 32 is not feasible. The email continues to explain that K8 Biomass Boiler was originally planned to have a 60MW capacity and include a turbine, hence the de-pluming commitment. However the proposals were subsequently changed and K8's capacity reduced to 32MW with no turbine.

The following NRW ICs have been confirmed as complete during the permit consolidation for this variation: NRW IC3, IC16, IC18, IC19, IC20, IC21, IC22 and IC23. NRW IC 4 & IC 17 have been marked as superseded, as discharges from W1 are due to be examined in more detail as part of a future NRW-led statutory review of compliance against the Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Industry BREF.

The NRW Operations Compliance team have requested re-run of NRW ICs 9 & 10 with a view to obtaining more up to date information. These have now been re-inserted into Table S1.3 of the permit as NRW IC 35 and 42.

### 7.3 Monitoring

We have decided that monitoring should be carried out for the parameters listed in Schedule 3 of the permit, using the methods detailed and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to:

- (i) Demonstrate compliance with emission limit values for air, water and sewer and to enable correction of measured concentration of substances to the appropriate reference conditions specified in Schedule 6 of the permit;
- (ii) To implement the monitoring frequencies and methods specified as BAT in the Wood Panels BAT conclusions;
- (iii) To ensure monitoring frequencies in the WCBC permit are incorporated into the NRW consolidated permit for existing and no backsliding occurs in this regard;

Permit condition 3.6.3 requires the operator to employ MCERTs certification or accreditation for monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme, unless otherwise agreed in writing.

In accordance with its legal requirement to do so, NRW reviews the development of new methods and standards and their performance in industrial applications.

Monitoring under abnormal operations arising from the failure of the installed CEMs for K8 Biomass Plant.

The applicant hasn't modelled the impact associated with abnormal emission limits as allowed by Article 45(1)(f) of IED and therefore normal IED ELV's apply. Please refer to the **Impact of Abnormal Operations** section above for more details.

## 7.4 Reporting

We have specified the reporting requirements in Schedule 4 of the consolidated permit. These are to meet the reporting requirements set out in the IED and ensure data is reported to enable timely review by NRW. This in turn helps to ensure that emissions of pollutants listed in Schedule 3 of the permit are within ELVs and that the installation is being operating in an efficient manner.

The annual production / treatment data required in Table S4.2, together with the Performance Parameters specified in Table S4.3 will also enable us to verify how efficiently the installation is operating over time.

All reporting forms specified in Table S4.4 have either been updated or are new as a result of this variation. (except FPET 1).

## 8. Other Legal Requirements

In this section, we explain how we have addressed other relevant legislation, to the extent that we have not addressed them elsewhere in this document.

## **The EPR 2016 and related Directives**

The EPR delivers the requirements of a number of European and National laws.

### **EPR 2016 IED requirements**

We address the requirements of IED in the body of this document above.

Schedules 7 and 13 EPR both require NRW to exercise its relevant functions so as to ensure compliance with a number of specific provisions of IED, including Article 5(1) and (3) IED. Article 5(3) requires that *‘In the case of a new Installation or a substantial change where Article 4 of Directive 85/337/EC [the EIA Directive] applies, any relevant information obtained or conclusion arrived at pursuant to Articles 5, 6, 7 and 9 of that Directive shall be examined and used for the purposes of granting the permit.’*

The Environmental Impact Assessment Directive (‘EIA’) is implemented in Wales by The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017. It places requirements on local planning authorities, Welsh Ministers and Inspectors with regard to environmental impact assessments for applications for planning consent.

Determination of planning consent applications is a matter for the relevant local planning authority. In this context, NRW’s obligation is to examine and use any relevant information obtained or conclusion arrived at during the planning consent process pursuant to the relevant EIA articles.

An Environmental Statement was not submitted in response to Question 5a of NRW application form Part C3. As such, NRW carried out an assessment of environmental impacts as detailed in this decision document and conducted its own consultation on the Application.

### **Schedule 9 to the EPR 2016 – Waste Framework Directive**

A waste operation is being conducted as a directly associated activity of the Installation’s main purpose. The requirements of Schedule 9 therefore apply.

This means that we must exercise our functions so as to ensure implementation of certain articles of the WFD. NRW must exercise its relevant functions for the purposes of ensuring that the waste hierarchy referred to in Article 4 of the WFD is applied to the generation of waste and that any waste generated is treated in accordance with Article 4 of the WFD.

The conditions of the permit ensure that waste generation from the facility is minimised. Where production of waste cannot be prevented, it will be recovered wherever possible or otherwise disposed of in a manner that minimises its impact on the environment. This is in accordance with Article 4.

NRW must also exercise its relevant functions for the purposes of;

implementing Article 13 of the WFD;

ensuring that the requirements in the second paragraph of Article 23(1) of the WFD are met; and

ensuring compliance with Articles 18(2) (b), 18(2) (c), 23(3), 23(4) and 35(1) of the WFD.

Article 13 relates to the protection of human health and the environment. These objectives are addressed elsewhere in this decision document. Article 23(1) requires the permit to specify;

- The types and quantities of waste that may be treated;
- for each type of operation permitted,
- the technical and any other requirements relevant to the site concerned;
- the safety and precautionary measures to be taken;
- the method to be used for each type of operation
- such monitoring and control operation as may be necessary; and
- such closure and after-care provisions as may be necessary

These are all covered by permit conditions. The permit does not allow mixing of hazardous wastes so Article 18(2) is not relevant.

We consider that the intended method of waste treatment is acceptable from the point of view of environmental protection so Article 23(3) does not apply. Energy efficiency is dealt with elsewhere in this decision documents but we consider the conditions of the permit ensure that the recovery of energy takes place at a high level of energy efficiency in accordance with Article 23(4).

Article 35(1) relates to record keeping and its requirements are delivered through permit conditions.

Schedule 22 to the EPR 2016 – Groundwater, Water Framework Directive and Groundwater Daughter Directives.

To the extent that it might lead to a discharge of pollutants to groundwater (a groundwater activity under EPR 2016), the permit is subject to the requirements of Schedule 22 EPR, which delivers the requirements of EU directives relating to pollution of groundwater.

The permit will require the taking of all necessary measures to prevent the input of any hazardous substances to groundwater, and to limit the input of non-hazardous pollutants into groundwater so as to ensure such pollutants do not cause pollution, and satisfies the requirements of Schedule 22.

No release to groundwater from the Installation are permitted, the permit also requires material storage areas to be designed and maintained to a high standard to prevent accidental releases.

To the extent that there could be relevant discharges to inland freshwaters, coastal waters or relevant territorial waters, Schedule 21 EPR applies.

### **Directive 2003/35/EC – The Public Participation Directive**

Regulation 59 of the EPR 2016 requires NRW to prepare and publish a statement of its policies for complying with its public participation duties. We have published our public participation statement.

This application has been consulted upon in line with that statement. This satisfies the requirements of the Public Participation Directive. Our decision in this case has been reached following an extensive programme of public consultation on the application. The way in which this has been carried out was explained earlier in this document.

The way in which NRW has consulted with the public and other interested parties is set out at the beginning of this document.

#### **National Welsh Legislation –**

Environment (Wales) Act 2016,  
Well-being and Future Generations (Wales) Act 2015,  
Environment (Wales) Act 2016,  
The Natural Resources Body for Wales (Establishment) Order 2012,  
The Natural Resources Body For Wales (Functions) Order 2013,  
(together ‘the Welsh Legislation’).

NRW has taken full account of its duties under the Welsh Legislation.

NRW is satisfied that this decision is consistent with its general purpose of pursuing the sustainable management of natural resources in relation to Wales, and applying the principles of sustainable management of natural resources.

In particular, NRW acknowledges that the principles of sustainable management include: making appropriate arrangements for public participation in decision making, taking account of all relevant evidence and gathering evidence in respect of uncertainties, taking account of the short-, medium- and long-term consequences of actions and taking account of the resilience of ecosystems.

NRW further acknowledges that it is an objective of sustainable management to maintain and enhance the resilience of ecosystems and the benefits they provide and,

in so doing meet the needs of present generations of people without compromising the ability of future generations to meet their needs, and contribute to the achievement of the well-being goals in section 4 of the Well-being of Future Generations (Wales) Act 2015.

NRW is satisfied that on the evidence the short-, medium- and long-term consequences of issuing a variation for the operation of this Installation will not affect the resilience of ecosystems and is consistent with the well-being goals.

In coming to this view, NRW gives significant weight to the measures proposed to control emissions to air from the Installation which NRW is satisfied are likely to be effective, and notes that it has no powers or duties with regard to traffic volume or movements outside of the permit boundary.

It further notes the contribution the operation of the Installation can make, in particular, to the achievement of the goal of a prosperous Wales by, for example, assisting the creation of a productive and low carbon society by using resources efficiently and proportionately.

NRW considers that it has set permit conditions in a consistent and proportionate fashion based on Best Available Techniques and considering all relevant matters.

NRW considers that it has pursued the objectives set out in the Welsh Legislation, where relevant, and that there are no additional conditions that should be included in this permit for those purposes.

We considered the impact of the Installation on 2 Local Wildlife Sites and 66 Ancient Woodland Sites within 2km that are not otherwise protected by designation as either European Sites or SSSIs. We have determined that significant pollution will not be caused at any of these sites as a result of aerial emissions from the Installation. (See [Non-Statutory Sites Assessment](#) section above). We are satisfied that no additional controls are required for the purposes of the Welsh Legislation.

### **Human Rights Act 1998**

We have considered potential interference with the rights protected by the European Convention on Human Rights in reaching our decision and consider that our decision is compatible with our duties under the Human Rights Act 1998. In particular, we have considered the right to life (Article 2), the right to a fair trial (Article 6), the right to respect for private and family life (Article 8) and the right to protection of property (Article 1, First Protocol). We do not believe the Conventions rights are engaged in relation to this variation determination.

### **Countryside and Rights of Way Act 2000 (CRoW 2000)**

Section 85 of this Act imposes a duty on NRW to have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty (AONB). We have exercised the relevant powers of our permitting function in such a way as to have regard to the purpose of conserving and enhancing natural beauty.

### **Wildlife and Countryside Act 1981**

Under Section 28G of the Wildlife and Countryside Act 1981, NRW has a duty in exercising its functions, so far as their exercise is likely to affect the flora, fauna or geological or physiographical features by reason of which a SSSI is of special interest, to take reasonable steps to further the conservation and enhancement of those flora, fauna or geological or physiographical features by reason of which a site is of Special Scientific Interest.

Under Sections 27AA and 28I NRW has a duty to notify its nature conservation function and the strategic conservation panel for the strategic planning area in relation to any proposed operation that is likely to damage a SSSI.

We assessed the application and concluded that there are 2 SSSIs within the 2km screening distance of the site. A further SSSI just outside this screening distance has been assessed as a precautionary measure. We notified our statutory nature conservation function and Natural England and are satisfied that the issue of this variation is not likely to damage any of the special interest features of the SSSIs.

## **National Secondary Legislation - The Conservation of Natural Habitats and Species Regulations 2017**

We have assessed the application in accordance with guidance agreed jointly with the conservation bodies in England and Wales and concluded that emissions to air associated with the installation will not adversely affect the integrity of any of the European sites considered.

A habitats assessment (FORM 1) was completed and we consulted with our statutory nature conservation function and Natural England who agreed with our conclusions.

## **Water Environment (Water Framework Directive Regulations 2017**

Consideration has been given to whether any additional requirements should be imposed in terms of NRW's duty under Regulation 3 to secure the requirements of the WFD, EQSD and GWD through (inter alia) EPR permits, but it is considered that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

## **9. OPRA**

The OPRA score will be used as the basis for subsistence and other charging, in accordance with our Charging Scheme. OPRA is Natural Resources Wales method of ensuring application and subsistence fees are appropriate and proportionate for the level of regulation required. The OPRA score for the installation has changed from 416 to 592 as a result of this variation.

## ANNEX 1A: Consultation Responses

### A) Advertising and Consultation on the Application

The Application has been advertised and consulted upon in accordance with Natural Resources Wales Public Participation Statement. The way in which this has been carried out along with the results of our consultation and how we have taken consultation responses into account in reaching our draft decision is summarised in this Annex. Copies of all consultation responses have been placed on Natural Resources Wales public register.

The Application was advertised on the Natural Resources Wales website from 5th September 2018 to 19th October 2018 and in The Leader (local newspaper) on 5th September 2018.

The following statutory and non-statutory bodies were consulted: -

- Betsi Cadwaladr University Health Board
- Canal and Rivers Trust
- Dŵr Cymru Welsh Water
- Food Standards Agency
- Health and Safety Executive
- North Wales Fire and Rescue Service
- Public Health Wales
- Wrexham County Borough Council (Environmental Protection Department)
- Wrexham County Borough Council (Planning Department)

#### 1) Consultation Responses from Statutory and Non-Statutory Bodies

Joint Response Received from Betsi Cadwaladr University Health Board and Public Health Wales	
Brief summary of issues raised:	Summary of action taken / how this has been covered
The response states the following overall conclusion:  “We have no grounds for objection, from a human health perspective based upon	

the information contained within the application”.

However, the following recommendations to NRW have been made:

1. “Whilst the air dispersion modelling results from normal operations appear unlikely to adversely impact on local air quality, we recommend that the regulator is satisfied with the approach adopted for the assessment of air quality and in particular the rationale with respect to predicted short-term particulate emissions”.
2. “It is important that management plans are robust so that on-site activities do not pose off-site nuisance, this should form part of any permit condition. In addition, the regulator should be satisfied that the applicant’s fire prevention plans are robust and comply with current guidance”

“Any additional information obtained by the Regulator in relation to these comments should be sent to us for consideration. Such information could affect the comments made in this response”

1. The air dispersion modelling has been updated at the request of NRW since this response was received and we are satisfied with the modelling approach used. The current version is the Fichtner report received on 15/12/22. We are satisfied that the short-term PC emission standard is unlikely to be exceeded at any sensitive human receptor location. See [Particulate matter PM<sub>10</sub> and PM<sub>2.5</sub>](#) section above.

2. Dust, odour and noise management plan submitted as part of application. Applicant has demonstrated BAT compliance for these aspects. See [Annex 2](#) below. NRW ICs 38,39, 40 and 41 added to permit. Updated plans will be incorporated as operating techniques in Table S1.2. Permit conditions covering release of substances not controlled by emission limits, odour, noise and vibration and Fire Prevention. Have also adopted WCBC conditions re: prevention of wind-blown particulates from stockpiles.

FPMP was resubmitted at our request. ICs set requiring further improvements, plus submission of updated FPMP following completion of this work, which will be an operating technique in Table S1.2.

Updated air dispersion modelling report dated 15/12/21 sent to PHW & BCUHB for re-consultation with a summary of our assessment of the results.

<b>Response Received from Canal and River Trust</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
No issues raised on the basis that there is no proposed change to the existing canal abstraction and no proposed new discharge to the canal.	N/A

<b>Response Received from Dŵr Cymru Welsh Water</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<p>Dŵr Cymru Welsh Water's response stated that:</p> <p>"If the development will give rise to a new discharge or alter an existing discharge of trade effluent, directly or indirectly to the public sewerage system, then a Discharge Consent under Section 118 of the Water Industry Act 1991 is required from Dwr Cymru / Welsh Water. Please note that the issuing of a Discharge Consent is independent of the planning process and a consent may be refused although planning permission is granted".</p>	No new discharges or changes to the composition of existing trade effluent as a result of this variation. Operator is undertaking work to re-zone the emission points to sewer at the installation. NRW IC43 imposed requiring revised copies of new trade effluent discharge consents for the newly zoned areas.

<b>Response Received from Food Standards Agency</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
No issues raised. The Food Standards Agency's response simply confirmed that they would not be commenting on the application.	N/A

<b>Response Received from Health and Safety Executive</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
The Health and Safety Executive (HSE) confirmed that they have no specific objections to the application at the initial consultation stage and are confident that Kronospan are aware of what they need to look at in respect of their COMAH duties relating to a significant change on site, having spoken directly to the site.	N/A

<b>Response Received from North Wales Fire and Rescue Service</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<p>No issues raised. The consultation response stated that:</p> <p>“the Fire Authority have no comments with regards to the consultation on the 4<sup>th</sup> September”.</p> <p>The response also explained that North Wales Fire and Rescue Service regularly carry out audits on the Kronospan site and is often in contact with site personnel, as the site is expansive, so the main fire safety file is broken down into separate areas.</p>	N/A

<b>Response Received from Wrexham County Borough Council (WCBC) Environmental Protection Department &amp; Planning Department</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<p>WCBC Planning confirmed that planning conditions relating to noise are applicable at the site (these conditions have been received as part of the consultation response).</p> <p>In terms of Statutory Nuisance, WCBC has received complaints alleging a noise nuisance from the site within the past three years (WCBC's noise complaint log for the site from members of the public dating from April 2016 to October 2018 has been received as part of the consultation response).</p> <p>WCBC has also highlighted that they are aware that a Large Group Action involving Hugh James Solicitors is the process of being taken against the Operator with regard to noise problems from the site.</p>	Please refer to the section in this decision document on noise.

## 2) Consultation Responses from Members of the Public and Community Organisations

A number of the issues raised during the consultation process are outside Natural Resources Wales remit in reaching its permitting decisions. Specifically questions were raised which fall within the jurisdiction of the planning system, both on the development of planning policy and the grant of planning permission.

Guidance on the interaction between planning and pollution control is given in PPS23 / Planning Policy Wales. It says that the planning and pollution control systems are separate but complementary. We are only able to take into account those issues, which fall within regulatory scope of the Environmental Permitting Regulations.

### a) Representations from Local MP, Assembly Member (AM), Councillors and Parish / Town / Community Councils

A representation was received from Councillor T Evans, who raised the following issues:

<b>Joint Response Received from Councillor T Evans</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
1. Concerns over proposed OSB line production increase.	OSB does not form part of this consolidation and variation.
2. Environmental monitoring in respect of dust, noise and chemical emissions.	Environmental monitoring is included within the permit and outlined in various sections of the decision document. IC's relating to these parameters have also been included.
3. Off-site monitoring and health impact of NO <sub>2</sub> at Ysgol Y Waun opposite the site entrance.	Off-site monitoring is outside the scope of this consolidation and variation and part of the local authority remit.
4. Increase in vehicle movements & associated related to the proposed OSB line.	OSB does not form part of this consolidation and variation.
5. Fumes from vehicles queuing at entrance impacting on people at the bus shelters at entrance to site.	Vehicle emissions outside the installation boundary are outside the scope of NRW's regulatory remit.

6. Concerns about increased noise associated with the proposed OSB line.	OSB does not form part of this consolidation and variation.
7. Noise	Please refer to section 7.1.4 of the decision document.
8. Ambient Air Monitoring for Formaldehyde immediately off-site.	Off site monitoring is outside of the scope and would be part of a local authority remit.
9. Concern over increased Formaldehyde production and Catalytic Converter malfunction, monitoring and testing.	Increased Formaldehyde production concern related to the OSB line which does not form part of the variation and consolidation. malfunction is addressed through standard permit conditions and emission limits. Formaldehyde has been referred to throughout this document and we have imposed the BAT-AELs and the new test method.
10. Increase in production and emissions and no established baseline for emissions.	Increased in production associated with OSB production does not form part of this consolidation and variation. An air emissions baseline has now been established please refer to our assessment referenced throughout this document .
11. Alternative access road suggested from the factory to the Whitehurst roundabout on the A5.	Road and infrastructure planning are outside the scope of NRW's regulatory remit under EPR and is a matter for the local authority.
12. OSB line impacting on the health and well-being of residents.	OSB does not form part of this consolidation and variation.

## **b) Representations from Community and Other Organisations**

No responses were received from Community and Other Organisation.

## **c) Representations from Individual Members of the Public**

A total of 19 of responses were received from individual members of the public. A drop-in event was attended by 55 people. Many of the issues raised were the same as those considered above. Only those issues additional to those already considered are listed below:

<b>Joint Response Received from Members of Public</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
1. Air Emissions – Extra CO <sub>2</sub> Generated	Section on BAT and CO <sub>2</sub> emissions can be found in section 7.2.1 of the decision document.
2. Dust Emissions – Increased dust from proposed OSB finishing line.	OSB does not form part of this consolidation and variation.
3. Dust Emissions	Dust emissions have been discussed in a number of areas in the document and associated IC's have been included in the permit. Particulates smaller than 2.5 microns can be found in Section 6.3.3 of the decision document.
4. New Homes on Local Development Plan – consideration of this as part of consolidation and variation	The OSB line no longer forms part of the consolidation and variation. Any new housing development would be out of scope and part of the planning regime.
5. Noise and Vibration – from the log yard, new silos, vehicle movements. Noise Creep. Vibration concerns from the gas engines.	Vehicle movements off site is out of scope of this consolidation and variation.  OSB does not form part of the consolidation and variation. NRW responsibilities are addressed in the <b>Other Legal Requirements</b> section of this document.
6. SMNR and Future Generations Act	OSB does not form part of the consolidation and variation.
7. OSB – noise and odour	Any visual impact /noise on heritage sites is outside of NRW remit and would be a matter for land use planning. The plant is existing. Please refer to the Biodiversity, Landscape, Heritage and Nature Conservation section in this decision document.
8. Heritage Sites – visual and noise impact	This is addressed by the BRef please refer to section on BAT in the decision document.
9. Waste Storage	OSB does not form part of the consolidation and variation.

10. Environmental Impact of increased Raw Materials use.  11. Odour	This has been addressed in section 7.1.5 of the decision document.
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As co-regulators of the installation WCBC were also consulted on the draft permit and decision document (please refer to letter dated 08/6/2022 from the LA). Issues associated with noise, dust, odour and fire risk associated with log yard storage were outlined. NRW considers these have been addressed in this document, as they also reflect the concerns of others, therefore the detail of the letter has not been fully replicated here.

## B) Advertising and Consultation on the Draft Decision

This section reports on the outcome of the public consultation on the draft decision which took place between 16 June 2022 and 17 July 2022.

In total there were 10 responses received by NRW on the draft decision. A drop in event also took place in Chirk Town Hall on 28 and 29 of June 2022 which was attended by 29 people. Many of the issues raised were similar in nature to those previously addressed so they have not been re-visited in this section of the decision document.

<b>Response Received from Chirk and Ceiriog Valley Branch Labour Party Branch Secretary</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
No specific issue raised on the draft decision.  Acknowledgement of proposed change in regulator to NRW.  Concerns regarding HSE  Disappointment expressed over diesel wagons serving the site being out of scope.	N/A   NRW forms part of the Competent Authority (CA) with the HSE for this COMAH site.  Planning concerns are out of scope of EPR.

<b>Response Received from Friends of the Earth England, Wales and Northern Ireland.</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
No specific issue raised over the draft decision.  Comments made in respect of the consultants Dispersion Modelling	N/A  Issues in respect of Human Health have been addressed in Section 6 of this Decision Document.

<p>assessment Dec 21 as submitted and specific sections signposted:</p> <p>Section 10 conclusion regarding PM2.5 and PM 10. Section 4 WHO revised AQG's in September 2021 and the report sites old WHO AQGs.</p> <p>Mechanism for permit review when there is change to requirements on air pollution.</p> <p>External Monitoring sites</p>	<p>NRW assessment of the air dispersion modelling was made using the current environmental standards and this has been outlined in this document.</p> <p>There was an update to the Environment Agency air emissions guidance on 29 April 2022 during the determination and writing of this document concerning Formaldehyde and this has been discussed in section 6.2.3. The permit is a 'live' document and subject to periodic review e.g. following the publication of a revised BRef.</p> <p>See above regarding external monitoring.</p>
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<b>Joint Response Received from Members of Public</b>	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<p>No specific issue raised over the draft decision.</p> <p>The comments were similar to those expressed at the consultation stage of the application.</p> <p>The main points of concerns have not been replicated here and can be viewed in the tables above under Annex 1 A).</p> <p>At the draft decision consultation stage the main concerns were around: Dust Emissions / offensive / air emissions and monitoring</p> <p>Various matters submitted as points made during the draft consultation drop in event. These included and were not limited to the following: question on timescales, NRW impartiality, inspections, sound monitoring, odour,</p>	<p>N/A</p> <p>Dust emissions have been discussed in a number of areas in the document and associated IC's have been included in the permit. Particulates smaller than 2.5 microns can be found in Section 6.3.3 of the decision document.</p> <p>No specific issues were raised on the content of the draft documents. List of points made states that some comments are statements and questions to NRW around regulation.</p>

dust, air emissions monitoring in Chirk, public feeling etc.	
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## Annex 2: Decision checklist regarding relevant BAT Conclusions for the production of wood-based panels

BAT Conclusions for the production of wood-based panels were published as Commission Implementing Decision (EU) 2015/2119 in the Official Journal of the EU on 20 November 2015. There are 28 BAT Conclusions. This checklist provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the existing installation. This annex should be read in conjunction with the consolidated permit.

All BAT Conclusions arising are listed by number in order below;

No	Summary of BAT Conclusion requirement	Status One of the following: Not Applicable, Currently Compliant, Not Compliant
General BAT conclusions		
Environmental Management System		

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
1.	Implement and adhere to an Environmental Management System (EMS) that incorporates all of the following features:  i) Commitment of the management, including senior management;  ii) Definition of an environmental policy that includes the continuous improvement of the installation by the management;  iii) Planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;	i) <b>Currently Compliant</b> – commitment demonstrated by Kronospan Board of Directors in commissioning and development of an EMS certified to ISO 14001 which has been in place since March 2005 and is firmly established throughout the site. Senior management and managers at all other levels within the company are fully committed to this process and continuous improvement in performance. (Exova BM TRADA certificate number 452).  ii) <b>Currently Compliant</b> – KC/EHS/DOC/001 is the Environmental and Sustainability Policy endorsed by Kronospan and signed by the company chairman. This policy is reviewed annually by senior management and set out key objectives for the company, including that to continuously improve environmental performance.  iii) <b>Currently Compliant</b> – Compliance with ISO 14001 requires determination of a site's environmental aspects and to ensure that control measures are in place to reduce any impact. This in some cases, may be achieved by implementing procedures which may be site or area specific.

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	iv) Implementation of procedures paying particular attention to: (a) Structure and responsibility; (b) Recruitment, training, awareness and competence; (c) Communication; (d) Employee involvement; (e) Documentation; (f) Effective process control; (g) Maintenance programmes;	<p>As part of developing a management system, the site has identified objectives to improve environmental performance and set targets to achieve these objectives within individual areas. These are recorded in plant area improvement programmes which are reviewed by internal and external auditing processes. The SHEQ (safety, health, environment and quality) department also identifies and implements targets on a site-wide basis to improve environmental performance.</p> <p>Improvements that require financial investment may be considered as either capital or revenue cost. Any improvement identified which requires significant financial investment is considered as part of the site's Capex programme.</p> <p><b>iv) Currently Compliant</b> – Kronospan operate in EMS in accordance with ISO 14001. This includes ensuring that points (a) through to (i) listed in the adjacent column are managed by the implementation of procedures within a well-established management system.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(h) Emergency preparedness and response; (i) Safeguarding compliance with environmental legislation  v) Checking performance and taking corrective action, paying particular attention to: (a) monitoring and measurement (see also the reference report on Monitoring); (b) corrective and preventive action; (c) maintenance of records; (d) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to the planned arrangements and has been properly implemented and maintained;	<b>v) Currently Compliant</b> – Kronospan operate an EMS in accordance with ISO 14001. Monitoring and measurement is carried out in compliance with Kronospan's environmental permit. Further environmental monitoring is carried out as a diagnostic tool to determine possible emission sources. Additional monitoring and measurement may also be carried out following the request of interested parties.  Corrective and preventive action is highlighted as a result of the investigation of incidents or audits. All actions are recorded and target dates agreed for completion. Reviews are carried out as part of the auditing process.  Records are maintained in accordance with procedure KC/EHS/PRO/004 Record Retention and Management. This ensures that information relating to the EMS is controlled, evaluated and disposed of in compliance with both legal and internal requirements, in most cases retention is for a period of four years. NB/ On review this needs to be amended to 6 years in line with the requirements of the permit conditions.

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	vi) Review of the EMS and its continuing suitability, adequacy, and effectiveness by senior management;  vii) Following the development of cleaner technologies;	<p>Internal auditing is carried out by trained and competent personnel within the Kronospan organisation both at a group and site level. An auditing programme is established on an annual basis to ensure that the EMS is performing as planned. External auditing of the EMS is carried out by management system consultancies biannually (on a three-yearly cycle) to monitor compliance and reconfirm certification to ISO 14001 and the environmental permit regulator.</p> <p>vi) <b>Currently Compliant</b> – A high level management review document is prepared annually for senior management that comprises such topics as the suitability, adequacy and effectiveness of the EMS. This includes changes in external and internal issues that might impact upon the EMS, needs and expectations of interested parties, compliance and other obligations, the extent to which objectives are being met and provision of resource. This is used as a tool to implement changes, where necessary, in order to ensure continual improvement.</p> <p>vii) <b>Currently Compliant</b> – Changes in technology are continuously reviewed to establish whether Kronospan can improve on existing plant and equipment and further reduce its environmental impact. If a new technology is identified with the potential to significantly improve performance, this is discussed with the regulators before implementation. Any operational change will be covered by a</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	viii) consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life;  ix) application of sectoral benchmarking on a regular basis;  x) waste management plan	<p>variation to the relevant environmental permit, detailing all technical aspects of the new technology or plant as well as its environmental impact. Installation is dependent on approval by the regulator and issue of a variation to the permit.</p> <p>viii) <b>Currently Compliant</b> - The Site Protection Monitoring Programme (SPMP) has been reviewed annually since 2010 and each review documents any changes to the site boundary and permitting activity, together with measures taken to protect land, pollution incidents and their remediation and details of any soil gas and water quality monitoring.</p> <p>ix) <b>Currently Compliant</b> – Sectoral benchmarking is frequently carried out internally within the Kronospan group. Externally, within the Wood Panel Industry Federation (WPIF), the use of BAT on emission abatement systems has been discussed and technologies and methods used have been compared in an open industry forum. Limited benchmarking is undertaken within Kronospan, mainly covering plant efficiency and chemical usage. The installation typically returns an average performance when compared with other Kronospan sites.</p> <p>x) <b>Currently Compliant</b> – waste management plan provided as Appendix D of Schedule 5 response #1 (21/01/19).</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	xi) quality control plan for recovered wood used as raw material for panels and used as a fuel;  xii) noise management plan;  xiii) odour management plan;  xiv) dust management plan.	xi) <b>Currently Compliant</b> - Supplementary information in S5 response #1 (21/01/19).  xii) <b>Currently Compliant</b> – dust, noise and odour management plan provided as Appendix E of Schedule 5 response #1 (21/01/19).  xiii) <b>Currently Compliant</b> – dust, noise and odour management plan provided as Appendix E of Schedule 5 response #1 (21/01/19).  xiv) <b>Currently Compliant</b> – dust, noise and odour management plan provided as Appendix E of Schedule 5 response #1 (21/01/19).
<b>Good Housekeeping</b>		
2.	In order to minimise the environmental impact of the production process, BAT is to apply good housekeeping principles using all of the techniques given below:  (a) Careful selection and control of chemicals and additives;	(a) <b>Currently Compliant</b> – The main chemical use on site is in two chemical plants which come under the COMAH Regulations; these are the Formalin and Resin Plants. The Formalin Plant stores large quantities of methanol and formalin. The formalin produced is transferred to the Resin Plant where it is processed with urea and / or melamine to produce the various resins

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	<p>(b) Application of a programme for the quality control of recovered wood used as a raw material and / or as fuel <sup>(1)</sup>, in particular to control pollutants such as, Pb, Cd, Cr, Cu, Hg, Zn, Chlorine, fluorine and PAH;</p> <p>(c) Careful handling and storage of raw materials and waste;</p>	<p>required for the MDF, Particleboard and Impregnation processes. All chemicals and additives used within these areas are stored ensuring at least secondary containment systems and in most cases tertiary containment, are in place.</p> <p>The main focus of the production process is wood-related products; chemicals and additives to these processes are selected, stored and managed in accordance with industry good practice, guidance (e.g. MSDS) and in compliance with any conditions or requirements of our environmental permits. Each chemical is assessed and will have an associated COSHH assessment where applicable for use in the workplace.</p> <p>(b) <b>Currently Compliant</b> - Supplementary information in S5 response #1 (21/01/19).</p> <p>(c) <b>Currently Compliant – Raw Materials Storage (Logyard)</b> Chemicals and additives are covered in section (a) above. The wood related products produced on site rely on adequate stocks of raw materials. These include:</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
		<p>recycled wood fibre (RCF), virgin chips, sawdust, bark and roundwood. These materials are currently stored on the Logyard facility in the open air. RCF currently comes into site on either curtain side or walking floor trailers and is stored in stockpiles no higher than eight metres under normal conditions. Round wood is delivered to site by either road or rail and is also stored in the open on the Logyard facility.</p> <p>The RCF arrangement described above can lead to issues with fugitive dust emissions on site and potentially from time to time off site. As a result a new facility is being installed on the Logyard to store RCF, wood dust, chips and bark in silos as described below:</p> <p><u>New RCF Reception Facility and Grading Plant</u></p> <p>The facility allows for a covered reception area for incoming RCF with two main large silos for the storage of graded process material and two smaller silos, one for fines and bark and the second for sawdust. Two further large silos will store chips from the Sawmill with a future use for Hacker chips. Bark from the Sawmill mixed in with fines from the RCF grading plant will be used as boiler fuel for the K8 Biomass Plant.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
		<p><u>Raw materials handling – Current Arrangements</u></p> <p>Roundwood stored on the Logyard is currently processed through an existing Rudnick &amp; Enners Hacker or an Andritz Disc Chipper. The existing Hacker was installed in 1986 and the Chipper in 1992. Both plants are still fully operational, but in need of replacement to ensure reliability of wood chip raw material for the raw board production process and to reduce environmental impact.</p> <p>Particleboard Process: The wood chips from the Hacker, along with RCF, are currently reduced in size by processing via one of eight Pallman Ring Flakers or one of two Hammer Mills. The cleaned woodchips along with sawdust and recycled fibre are transferred to silos before being dried in one of two wood dryers.</p> <p>MDF: The wood chips are produced by the Andritz Disc Chipper as it removes the outer bark from roundwood to produce peeled chips for the MDF process. Certain grades of MDF are made from unpeeled chips produced in the Hacker without debarking. This is due to a lack of capacity on the Andritz Chipper which has the potential to impact on final product quality.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
		<p>Wood chips for the MDF process are passed to the MDF refiner plant for processing into resinated wood fibre.</p> <p><u>New Chipper and Flaker Roundwood Processing Plant</u></p> <p>The new Chipper and Flaker plant will replace the existing arrangements described above. The round wood will be delivered to the existing rail siding area where it will be unloaded by crane onto a conveying system and then into the new Chipper/Flaker building to produce wood chips. The processed material will then be transferred to storage silos for onward use both in the Particleboard and MDF processes. The new facilities will have larger capacity than the existing arrangements and will ensure that all material for the Particleboard and MDF processes can be debarked prior to the production of wood chips, resulting in a better quality product.</p> <p>The new facilities will lessen environmental impact by reducing noise levels and dust potential from the site, which can be an issue due to vehicle movements around the Logyard processing area and delivering raw materials to the site. The visual aspect of the site will also be improved.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(d) Regular maintenance and cleaning of equipment, transport routes and raw material storage areas;	<p>Vehicle movements on the Logyard have always been high risk activities carried out under strict controls requiring close supervision of all tasks. As a result of this project, the number of Logyard vehicles will be reduced with most materials being conveyed rather than moved around the Logyard by log grabs and bucket loaders, this is a significant safety improvement.</p> <p><u>Waste</u></p> <p>All waste on site is segregated and stored in designated areas around site. Individual departments have their own local waste storage facilities that are audited during weekly departmental environmental audits. This are emptied into the main site amenities. All areas are regularly inspected to ensure they are kept tidy and that wastes are being disposed of in the appropriate storage areas. This ensures that the waste hierarchy can be applied effectively. Any spillage is cleared up immediately.</p> <p>(d) <b>Currently Compliant</b> – Supplementary information in S5 response #1 (21/01/19).</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(e) Review options for the reuse of process water and the use of secondary water sources.	<p>(e) <b>Currently Compliant</b> – The main sources of water around site are: Town's water, borehole water, canal water and surface water drainage.</p> <p><u>Borehole and canal water</u></p> <p>Borehole water is abstracted from a number of points around site and can be used as process water or as a make-up water for cooling towers used on the Formalin and Resin plants.</p> <p>Borehole water and treated canal water is used as a process water or boiler feed water. Prior to use it is deoxygenated in a hot well and then chemically treated in the boiler to prevent corrosion. Blow down waters from the boiler are discharged to the sites foul water drainage system via discharge consents.</p> <p><u>Surface water drainage</u></p> <p>Surface waters from the site drain into one of three holding lagoons on site, with a capacity of 2,022 m<sup>3</sup> in each Lagoon. Waters stored in Lagoon 3, which is mainly rainwater, is used as firewater in the Logyard rail siding area. In the event of fire, the lagoon waters can be used as a secondary source of water for the on-site or</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
		<p>off-site fire services. In the past, this has been the subject of an on-site exercise to prove that this is a feasible option for tackling a fire or incident on site.</p> <p><u>Process water (reuse)</u></p> <p>Process water can be cleaned and reused in various parts of the process, including MDF and resin.</p>
3.	<p>In order to reduce emissions to air, BAT is to operate the waste gas treatment systems with a high availability and at optimal capacity during normal operating conditions. Special procedures can be defined for other than normal operating conditions, in particular:</p> <p>(j) During start-up and shut-down operations;</p>	<p>(i) <b>Currently Compliant</b> – Plant start-up and shut down operations are controlled by individual plant areas following plant specific procedures. Proactive maintenance is carried out following a plant maintenance shutdown plan. Operational and maintenance staff liaise to ensure that there is no adverse effect on the environment, people or plant.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(ii) During other special circumstances which could affect the proper functioning of the systems (e.g. regular and extraordinary maintenance work and cleaning operations of the combustion plant and / or of the waste gas treatment system).	<p>To ensure no environmental impact the process shutdown / start-up will take into account management of any abatement system in place, waste water discharge and waste collection and disposal.</p> <p>(ii) <b>Currently Compliant</b></p> <p><u>Extraordinary maintenance</u></p> <p>Reactive or extraordinary maintenance is carried out in a controlled way to ensure that all abatement systems and potential wastes generated (to air, water or solid) are managed in compliance with Kronospan's environmental permits, management systems, and all relevant legislation, regulation and guidance.</p> <p><u>Cleaning operations of combustion plant and waste gas treatment system</u></p> <p>All cleaning operations around the installation are carried out to ensure that the environmental impact on the workforce and residents in Chirk is minimised. Kronospan have two Biomass boilers and currently 3 CHP gas engines. Waste hot gases from the combustion plant are ducted into the MDF process before being discharged to atmosphere via the MDF cyclones.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
		<p>In general, efficient combustion helps to maintain nitrogen dioxide and carbon monoxide levels in compliance with the relevant environmental permit standards. On the gas engines this is helped by fine tuning of the boiler and the addition of a catalyst abatement system to reduce carbon monoxide levels.</p> <p>The K8 Biomass Plant has additional abatement for nitrogen dioxide in the form of Selective Non-Catalytic Reduction (SNCR) and active lime addition to help reduce levels of acid gases (sulphur dioxide and hydrogen chloride).</p>
<b>Noise</b>		
4.	<p>In order to prevent or, where that is not practicable, to reduce noise and vibration, BAT is to use one or a combination of the techniques given below (prevention / point source reduction / site level reduction):</p> <p>(a) Strategic planning of the plant layout in order to accommodate the noisiest operations e.g. so that on-site buildings act as insulation (generally applicable in new</p>	<p>(a) <b>Currently Compliant</b></p> <p>When installing new plant, noise is taken into consideration and plant is designed in order to minimise noise off-site. Noise surveys are carried out as part of planning applications prior to installation to assess the impact of any new plant to the surrounding areas.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	<p>plants – layout of a site may limit applicability on existing plants);</p> <p>(b) Applying a noise reduction programme which includes noise source mapping, determination of off-site receptors, modelling of noise propagation and evaluation of the most cost-effective measures and their implementation;</p> <p>(c) Performing regular noise surveys with monitoring of noise levels outside the site boundaries;</p>	<p>(b) <b>Currently Compliant</b> - Supplementary information in S5 response #1 (21/01/19).</p> <p>(c) <b>Currently Compliant</b></p> <p>Qualitative noise monitoring is carried out at least once a month at various locations within the local area. These points take into account sensitive receptors as identified during previous noise surveys, being located where noise from the plant has the potential to cause a nuisance (e.g. areas with a large residential population, or sensitive receptors (e.g. schools), or where previous complaints have been received.</p> <p>Currently there are ten locations that are assessed each month, which were agreed with WCBC, however additional areas may be included following any complaints or to ensure that any issues found have been resolved effectively. Monthly monitoring takes place at random times throughout the day as well as occasional monitoring at night / early morning / weekends. This is the only time during regular monitoring that quantitative measurements are taken due to the</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(d) Enclosing noise equipment in housing or by encapsulation and by soundproofing buildings;	<p>disruption from other background sources during the day. Noise levels are also measured during surveys carried out by third parties.</p> <p><b>(d) Currently Compliant</b></p> <p>As previously discussed, going forward a standard of 75 dBA at 1 metre from the exterior of the building is being adopted. For plant and equipment outside of buildings, the aim is to reduce noise levels to as low as reasonably practicable. This will be carried out by careful selection of plant and equipment for example a band conveyor may be chosen as opposed to a bucket conveyor. Plant that is identified by a noise survey as having a high noise impact, may be enclosed via acoustic booths or panelling as part of the noise reduction programme.</p> <p><b>(e) Currently Compliant</b></p> <p>Vibrational noise has not been an issue in the past. However, if this was to change and either complaints regarding this type of noise were received or if it</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	<p>(e) Decoupling individual equipment to pre-empt and limit propagation of vibrations and resonance noise;</p> <p>(f) Point source insulation using silencer, damping, attenuators on noise sources, e.g. fans, acoustic vents, mufflers, and acoustic enclosures of filters;</p> <p>(g) Keeping gates and doors closed at all times when not in use. Minimising the fall height when unloading roundwood;</p>	<p>was identified via a noise survey, any necessary course of action would be adopted to reduce the impact wherever possible.</p> <p>(f) <b>Currently Compliant</b></p> <p>As previously discussed in this section, equipment that produces a high level of noise is generally fitted with noise reduction devices to lessen any off-site impact. Careful consideration is taken in selecting the correct device for the plant. For example, as detailed in environmental permit improvement programme, the preproduction Dryer 2 Belt Drive was fitted with acoustic screening while the Formalin Plant Turbo Compressor Discharge Pipe was fitted with a silencer.</p> <p>(g) <b>Currently Compliant</b></p> <p>Most factory doors are self-closing to reduce noise impact. Where this is not the case, employees are reminded to ensure that doors are closed from 7pm until 7am as a minimum. In some cases this has been in agreement with the environmental regulator. Any complaints arising from local residents due to noise from open doorways are responded to immediately and any remedial action taken. At all times and as part of routine operations, the fall height when</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	<p>(h) Reducing noise from traffic by limiting the speed of internal traffic and for trucks entering the site;</p> <p>(i) Limiting outdoor activities during the night;</p>	<p>unloading roundwood is minimised from both the rail off-loading facility and road deliveries.</p> <p><b>(h) Currently Compliant</b></p> <p>The on-site speed limit is set at 10 mph, or 5 mph in some designated areas. Speed limiters are installed on certain vehicles, all vehicles entering the site must obey local signage. A speed gun is used occasionally in various areas of the site as a check on compliance and near miss reporting is used as a tool to identify any vehicles that may be exceeding the speed limits. Any issues with external hauliers would be dealt with by the Despatch / Timber Buying Departments contacting the specific haulier with complaints.</p> <p><b>(i) Currently Compliant</b></p> <p>Outdoor activities that may have an impact off-site are prohibited between the hours of 7pm and 7am. This is mainly the use of the main site skips which are located on the eastern boundary of the site, parallel with the main road through the local neighbourhood.</p> <p><b>(j) Currently Compliant</b></p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(j) Regular maintenance of all equipment;  (k) Using noise protection walls, natural barriers or embankments to screen noise sources.	Equipment onsite is maintained following a proactive maintenance schedule.  <b>(k) Currently Compliant</b>  Along the length of the eastern boundary of the site with Holyhead Road is a large embankment and tree-line that acts as a screen to reflect noise on-site. Occasionally, production requires the use of the Chipper (a large log chipping plant) after the hours of 7pm. In these cases a log wall is erected around the plant to screen noise and prevent it from travelling beyond the site boundary as best as possible.
<b>Emissions to Soil and Groundwater</b>		
5.	In order to prevent emissions to soil and groundwater, BAT is to use the techniques given below:  (i) Load and unload resins and other auxiliary materials only in designated areas that are protected against leakage run-off;	<b>(i) Currently Compliant</b>  All resins used for production are produced on-site and therefore very little loading / unloading takes place. The resins are piped directly from the reactors into storage silos before being transferred to the relevant production

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(ii) Whilst awaiting disposal, collect all material and store in designated areas protected against leakage run-off;	<p>department. The only occasion for requiring road tanker deliveries would be in the event of insufficient production from the internal Resin Department. In this instance, all resin storage silos are fully bunded to prevent spillages to ground and are within a fully concreted tank farm area that also has tertiary containment (Middle Road). The Middle Road drains are concreted and sleeping policemen provide a barrier to prevent any spillage going to drain.</p> <p>Other auxiliary materials that are delivered via tanker (e.g. methanol, caustic or acids) are also received into fully bunded storage silos or tank farms, either within the Resin or Formalin Department or on the Middle Road; again all have tertiary containment in addition to bunding.</p> <p>(ii) <b>Currently Compliant</b></p> <p>Bulk liquid wastes are either collected directly from source via a road tanker for disposal or stored in intermediate bulk containers (IBCs or drums) before removal from site. All waste IBCs are held in a designated waste compound of concrete construction that is bunded to prevent spillage to ground.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(iii) Equip all pump sumps or other intermediary storage facilities from which spillages may occur with alarms activated by high levels of liquid;  (iv) Establish and implement a programme for the testing and inspection of tanks and pipelines carrying resins, additives and resin mixes;	(iii) <b>Currently Compliant</b> - Supplementary information in S5 response #1 (21/01/19).  (iv) <b>Currently Compliant</b>  Storage tanks that store hazardous materials are inspected in accordance with a written scheme of inspection, by Allianz Risk Services. Normal inspection period is 5 years.  Storage tanks that store hazardous materials are situated in bunds, which are inspected. Storage tanks that store non-hazardous materials are situated within spill containment areas. Bunds and spill containment areas are monitored weekly, as part of environmental audit, for any signs of spillage or leakage.  Pipelines that convey hazardous materials are inspected in accordance with a written scheme of inspection, by Allianz Risk Services. Thorough inspection period is 5 years.

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	<p>(v) Carry out inspections for leaks on all flanges and valves on pipes used to transport materials other than water and wood; maintain a log of these inspections;</p> <p>(vi) Provide a containment system to collect any leaks from flanges and valves on pipes used to transport materials other than water and wood, except when the construction flanges or valves is technically tight;</p>	<p>Pipelines that convey non-hazardous materials are primarily situated within spill containment areas. Bunds and spill containment areas are monitored weekly, as part of environmental audit, for any signs of spillage or leakage.</p> <p>(v) <b>Currently Compliant</b></p> <p>Flanges and valves are inspected as part of the respective pipelines described above.</p> <p>(vi) <b>Currently Compliant</b></p> <p>Flange pressure rating depends on the design pressure of the particular system, in accordance with Kronospan Pipeline Specifications. On most systems this will be a minimum of PN10 (i.e. 10 bar).</p> <p>Most pumping systems use centrifugal pumps, where pump design pressure is lower than the pipeline / flange pressure. Where gear pumps are used, pressure relief valves that relieve pipe up-stream of pump are used.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(vii) Provide an adequate supply of containment booms and suitable absorbent material;	<p>Wherever possible, new pipelines and flanges are pressure tested to ensure they are technically tight. In accordance with critical pipework assessment by Allianz Risk services, flange guards have been fitted to 96% sulphuric acid pipeline flanges.</p> <p>Pipework conveying Formaldehyde and Caustic Soda is insulated and protected by cladding.</p> <p>(vii) <b>Currently Compliant</b></p> <p>Emergency spill kits are available across site in designated areas that were assessed as being those with the greatest risk of spill. Careful consideration has been given in each area to the type of spill that might occur (i.e. oil or chemical) and each spill kit will contain the most suitable materials in the form of booms, mats, pillows etc. Additional absorbent material is available in the company stores and wood chip / shavings can also be used if the spill is in the vicinity of the Logyard / Sawmill. Spill kits are checked and replenished if necessary every two weeks or after use. All materials used to manage a spill would be disposed on in a suitable manner.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(viii) Avoid underground piping for transporting substances other than water or wood;  (ix) Collect and safely dispose of all water from fire-fighting;	(viii) <b>Currently Compliant</b>  All pipework on-site is above ground, except for pipework that comprises the foul sewer and surface water drainage systems.  (ix) <b>Currently Compliant</b>  Fire-fighting water is contained within the plant / plant bund before being appropriately disposed of. If water breaches this and enters the surface water drainage system, it would be contained by isolating one of the surface water lagoons and ensuring swift closure of Penstock A as a further precautionary measure. This would prevent water from entering the local watercourse and allow for suitable disposal procedures to be implemented. All foul sewer drains have close-fitting manhole covers except for the Middle Road Pit. The Middle Road Pit has a sump pump which in the event of a fire within the Preproduction area, would be isolated to prevent any discharge to sewer.  (x) <b>Currently Compliant</b>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(x) Construct impermeable bottoms in retention basins for surface water run-off water from outdoor wood storage areas.	All three surface water lagoons are lined and constructed with concrete bases. On an annual basis, all three lagoons are emptied and cleaned of residual solids and at this time the condition of the lagoons are also assessed.
<b>Energy Management and Energy Efficiency</b>		
6.	In order to reduce energy consumption, BAT is to adopt an energy management plan, which includes all of the techniques given below:  (i) Use a system to track energy usage and costs; (ii) Carry out energy efficiency audits of major operations; (iii) Use a systematic approach to continuously upgrade equipment in order to increase energy efficiency; (iv) Upgrade controls of energy usage; (v) Apply in-house energy management training for operators.	<b>Currently Compliant</b>  All of the adjacent techniques (i) to (v) are used to reduce energy consumption. The energy consumption from all major energy consumers is collated and analysed daily. This data is used to make decisions on when to renew or upgrade equipment. Energy management training is given to operators of energy intensive plant with a focus on saving energy whenever possible. For example, shutting down plant during periods of downtime. Every four years a third-party energy auditor assesses the site's energy producing and consuming plant. The auditor analyses trends in the consumption data and outlines improvement opportunities. This audit provides compliance with the Energy Saving Opportunities Scheme (ESOS).
7.	In order to increase energy efficiency, BAT is to optimise the operation of the combustion plant by monitoring and controlling key combustion parameters (e.g. O <sub>2</sub> , CO, NO <sub>x</sub> ) and applying one or a combination of the techniques given below:	<b>Currently Compliant</b>  Points (a) and (c) are used.

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(a) Dewater wood sludge before it is used as a fuel; (b) Recover heat from hot waste gases in wet abatement systems using a heat exchanger; (c) Recirculate hot waste gases from different processes to the combustion plant or to preheat hot gases for the dryer.	
8.	In order to use energy efficiently in the preparation of wet fibres for fibreboard production, BAT is to use one or a combination of the techniques given below:  (a) Cleaning and softening of chips (Mechanical cleaning and washing of raw chips); (b) Vacuum evaporation (recovering hot water for steam generation); (c) Heat recovery from steam during refining (Heat exchangers to produce hot water for steam generation and chip washing).	<b>Currently Compliant</b>  Points (a) and (b) are used.
<b>Odour</b>		

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
9.	<p>In order to prevent or, where that is not practicable, to reduce odour from the Installation, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:</p> <p>(i) A protocol containing actions and timelines;</p> <p>(ii) A protocol for conducting odour monitoring;</p> <p>(iii) A protocol for response to identified odour events;</p>	<p>(i) <b>Currently Compliant</b></p> <p>The site's Odour Management Plan (OMP) set out how the company manages reduction of odour from the installation. The procedure is reviewed and updated on an annual basis.</p> <p>(ii) <b>Currently Compliant</b></p> <p>As dictated in the OMP, off-site odour monitoring is carried out concurrently with noise monitoring on at least a monthly basis at various sensitive receptors in the town of Chirk. On-site monitoring of any potential odour sources takes place during weekly department environmental audits, recorded on individual checklist sheets.</p> <p>(iii) <b>Currently Compliant</b></p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(iv) An odour prevention and reduction programme designed to identify the source(s); to measure / estimate odour exposure; to characterise the contributions of the sources; and to implement prevention and /or reduction measures.	<p>Odour events are treated as an environmental incident and would be responded to using the generic incident investigation procedure (KC/EHS/PRO/010). Appropriate initial action would be taken to prevent any off-site impact, followed by further investigative work to determine the root cause of any abnormal odour emissions and put actions in place to prevent reoccurrence. Should an off-site odour complaint be received, the standard complaints procedure (KC/EHS/PRO/016) that is used for all external complaints will be followed.</p> <p>(iv) <b>Currently Compliant</b> -The OMP identifies the main potential sources of odour on-site as well as the prevention and mitigation measures, as demonstrated in the table in section 1.</p> <p>Supplementary information in S5 response #1 (21/01/19).</p>
10.	In order to prevent and reduce odour, BAT is to treat waste gas from the dryer and the press according to BAT 17 and 19.	<b>Currently Compliant</b>
<b>Management of Waste and Residues</b>		
11.	In order to prevent or, where that is not practicable, to reduce the quantity of waste being sent for disposal, BAT is to adopt and implement a waste management plan as part of the	<b>Currently Compliant</b> - Kronospan's waste management procedure (KC/EHS/PRO/015) sets out the details to which waste produced on site is handled. This is reviewed at least annually to ensure that the waste hierarchy is applied to all

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	environmental management system (see BAT 1) that, in order of priority, ensures that waste is prevented, prepared for reuse, recycled or otherwise recovered.	waste streams in the light of any new options for prevention, reduction or reuse. Waste is segregated at source to ensure that the appropriate route can be applied. Where waste wood from production is unavoidable, Kronospan utilises this as raw material or as a fuel source (e.g. sander dust for the particleboard direct heating dryers).  Supplementary information in S5 response #1 (21/01/19).
12.	In order to reduce the quantity of solid waste being sent for disposal, BAT is to use one or a combination of the techniques given below:  (a) Reuse internally collected wood residues, such as trimmings and rejected panels, as a raw material;  (b) Use internally collected wood residues, such as wood fines and dust collected in a dust abatement system and wood	(a) <b>Currently Compliant</b>  All wood residues collected from the process, are wherever possible, reused as a raw material.  (b) <b>Currently Compliant</b>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	<p>sludge from waste water filtration, as fuel (in appropriately equipped on-site combustion plants) or as a raw material;</p> <p>(c) Use ring collection systems with one central filtration unit to optimise the collection of residues, e.g. bag filter, cyclofilter, or high efficiency cyclones.</p>	<p>The biomass plants use only wastes from the process as a fuel. Supplementary information in S5 response #1 (21/01/19).</p> <p>(c) <b>Currently Compliant</b></p> <p>Bag filters and cyclones are used throughout the site for various parts of the process and all residues are collected and stored in silos before being either re-used in the process or burnt as a fuel in the two biomass boilers on site. Material is transported between the bag filter, cyclones and relevant silos by blow lines. Storage silos also have their own bag filters and / or cyclones to prevent emissions to atmosphere. All bag filters and cyclones are detailed as abatement systems and potential release points within the environmental permit. They are also contained within the environmental management system aspects registers (area specific) that documents relevant control measures to reduce any potential impact to the environment. For example, the particleboard and MDF sander dust which is burnt as a fuel in the biomass boilers.</p>
13.	In order to ensure the safe management and reuse of bottom ash and slag from biomass-firing, BAT is to use all of the techniques given below:	

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	<p>(a) Continuously review options for off-site and on-site reuse of bottom ash and slag;</p> <p>(b) An efficient combustion process which lowers the residual carbon content;</p>	<p><b>(a) Currently Compliant</b></p> <p>Boiler ash is currently sent to a hazardous waste landfill site with a WAC derogation. Disposal is reviewed at least annually for further options. At present, the boiler ash carries a mirror hazardous EWC code due to the lead content and consequentially options are limited. Options explored to this day include breeze-block manufacturing (a former disposal route), cement production and road construction but none provide a viable and reliable route at this time. There are currently no reuse options available on-site.</p> <p>Supplementary information in S5 response #1 (21/01/19).</p> <p><b>(b) Currently Compliant</b></p> <p>There is an efficient combustion process that ensures residual carbon content is not an issue in the boiler ash from the biomass plants.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	<p>(c) Safe handling and transport of bottom ash and slag in closed conveyors and containers, or by humidification;</p> <p>(d) Safe storage of bottom ash and slag in a designated impermeable area with leachate collection.</p>	<p>Not enough information to demonstrate this thoroughly so IC37 to investigate included.</p> <p>(c) <b>Currently Compliant</b></p> <p>Boiler ash is transported within the plant inside a conveying system. The bottom ash from the two biomass boilers is wetted within the boiler before being discharged. This allows for easier transportation and handling, as well as reducing the risk of fire. The ash is then transferred to a central location on-site for storage prior to disposal off-site.</p> <p>Supplementary information in S5 response #1 (21/01/19).</p> <p>(d) <b>Currently Compliant</b></p> <p>Boiler ash is stored in a designated area that consists of a concrete floor and three-sided bund walls. Any leachate collects in one corner of the bund which can then be pumped out for removal to an approved disposal site.</p>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
<b>Monitoring</b>		
14.	BAT is to monitor emissions to air and water and to monitor process flue-gases in accordance with EN standards with at least the frequency given below. If EN standards are not available, BAT is to use ISO, national, or other international standards that ensure the provision of data of an equivalent scientific quality.	<b>Currently Compliant</b> We have imposed emission limits and monitoring requirements for relevant pollutants in Tables S3.4 and S3.5 of the Permit.
15.	In order to ensure the stability and efficiency of techniques used to prevent and reduce emissions, BAT is to monitor appropriate surrogate parameters.  <u>Description</u> The surrogate parameters monitored may include: waste gas airflow, waste gas temperature, visual appearance of emissions, water flow and water temperature for scrubbers, voltage drop for electrostatic precipitators, fan speed and pressure drop across bag filters. The selection of surrogate parameters depends on the techniques implemented for the prevention and reduction of emissions.	<b>Currently Compliant</b>  There are various abatement systems on-site whereby the emissions to atmosphere are monitored at a frequency agreed in the environmental permit. All abatement systems, in some way, have other techniques which are used to monitor the efficiency of the system. Three examples are given below: <ol style="list-style-type: none"> <li>1. The WESP 21 (wet electrostatic precipitator) – in-line with manufacturers guidelines, a number of parameters are monitored by the operating team.</li> <li>2. Dust Filtration Systems – differential pressure measurements, some of which are direct readings and some remote, can indicate either a split or blocked bag(s) or blocked blow line.</li> </ol>

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
		3. Press abatement system for Particleboard and MDF processes (wet venturi scrubber) – providing adequate water flow to the scrubber in relation to the process gas flow which will ensure optimum abatement system performance.
16.	BAT is to monitor key process parameters relevant for emissions to water from the production process, including waste water flow, pH, and temperature.	<b>Currently Compliant</b> All emitted water streams are monitored for flow rate, pH and temperature.
<b>Emissions to Air</b>		
<b>Channelled Emissions</b>		
17.	In order to prevent or reduce emissions to air from the dryer, BAT is to achieve and manage a balanced operation of the drying process and to use one or a combination of the techniques given below:  (a) Dust abatement of inlet hot gas to a directly heated dryer in combination with one or a combination of the other techniques listed below (dust); (b) Bag filter (dust); (c) Cyclone (dust);	<b>Currently Compliant</b>  The Particleboard process on-site uses directly heated dryers. Dust and VOC emissions are reduced from this process via a wet electrostatic precipitator (e).  The MDF process indirectly heated fibre dryers use a cyclone abatement technique (c).  Supplementary information in S5 response #1 (21/01/19).

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
	(d) UTWS dryer and combustion with heat exchanger and thermal treatment of discharged dryer waste gas (dust, VOCs); (e) Wet electrostatic precipitator (dust, VOCs); (f) Wet scrubber (dust, VOCs); (g) Bioscrubber (dust, VOCs); (h) Chemical Degradation or capture of formaldehyde with chemicals in combination with a wet scrubbing system (formaldehyde).	We have imposed the appropriate BAT-AELs for emissions from the dryer and for combined treated emissions from the dryer and the press in Table S3.4 of the Permit.
18.	In order to prevent or reduce NO <sub>x</sub> emissions to air from directly heated dryers, BAT is to use technique (a) or technique (a) in combination with technique (b):  (a) Efficient operation of the combustion process using air- and fuel-stage combustion, while applying pulverised combustion, fluidised bed boilers or moving grate firing; (b) Selective non-catalytic reduction (SNCR) by injection and reaction with urea or liquid ammonia.	<b>Currently Compliant</b>  With regard to the directly heated dryers on site, Kronospan adopt technique (a), applying pulverised combustion.  We have imposed the appropriate BAT-AELs for NO <sub>x</sub> control from the directly heated dryers in Table S3.4 of the Permit.

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
19.	<p>In order to prevent or reduce emissions to air from the press, BAT is to use in-duct quenching of collected press waste gas and an appropriate combination of the techniques given below:</p> <ul style="list-style-type: none"> <li>(a) Select resins with a low formaldehyde content (VOCs);</li> <li>(b) Controlled operation of the press with balanced press temperature, applied pressure and press speed (VOCs);</li> <li>(c) Wet scrubbing of collected press waste gases using Venturi scrubbers or hydrocyclones, etc. (dust, VOCs);</li> <li>(d) Wet electrostatic precipitator (dust, VOCs);</li> <li>(e) Bioscrubber (dust, VOCs);</li> <li>(f) Post-combustion as the last treatment step after application of a wet scrubber (dust, VOCs).</li> </ul>	<p><b>Currently Compliant</b></p> <p>Waste gases from all presses are controlled by the application of techniques (a), (b) and (c). Resins selected for use in both Particleboard and MDF have formaldehyde contents that are as low as possible without compromising product quality. There are individual wet scrubbers (c) for all individual press lines, but the waste gas from each line is combined into one duct which is directed to the WESP 32 duct for emission to atmosphere.</p> <p>Supplementary information in S5 response #1 (21/01/19).</p> <p>We have imposed the appropriate BAT-AELs for emissions to air from the press in Table S3.4 of the Permit.</p>
20.	<p>In order to reduce dust emissions to air from upstream and downstream wood processing, conveying of wood materials and mat forming, BAT is to use either a bag filter or a cyclofilter. (Due to safety concerns, a bag filter or a cyclofilter may not be applicable when recovered wood is used as a raw material. In that case a wet abatement technique (e.g. scrubber) may be used.</p>	<p><b>Currently Compliant</b></p> <p>Dust emissions from wood processing activities on site are reduced by either or a combination of, bag filtration systems, dust cyclones and wet scrubbers.</p> <p>We have imposed the appropriate BAT-AELs for emissions to air for channelled dust emissions to air from upstream and downstream wood processing, conveying of</p>

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		wood materials and mat forming in Table S3.4 of the Permit, with the requirement for continuous process monitoring of all bag filter plant in Table S3.8 of the Permit.
21.	In order to reduce emissions of volatile organic compounds to air from the drying ovens for the impregnation of paper, BAT is to use one or a combination of the techniques given below: <ul style="list-style-type: none"> <li>(a) Select and use resins with a low formaldehyde content;</li> <li>(b) Controlled operation of ovens with balanced temperature and speed;</li> <li>(c) Thermal oxidation of waste gas in a regenerative thermal oxidiser or a catalytic thermal oxidiser;</li> <li>(d) Post-combustion or incineration of waste gas in a combustion plant;</li> <li>(e) Wet scrubbing of waste gas followed by treatment in a biofilter.</li> </ul>	<b>Currently Compliant</b>  Resins selected for use in the Paper Impregnation Department have formaldehyde contents that are as low as possible without compromising product quality. The temperature and speed of the drying ovens are closely monitored and controlled as this also aids production. Waste gases are passed through wet scrubbers.  We have imposed the appropriate BAT-AELs for emissions to air from the drying ovens for the impregnation of paper in Table S3.1 of the Permit.
<b>Diffuse Emissions</b>		
22.	In order to prevent or, where that is not practicable, to reduce diffuse emissions to air from the press, BAT is to optimise the	<b>Currently Compliant</b>

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	efficiency of the off-gas collection and to channel the off-gases for treatment (see BAT 19). (Effective collection and treatment of waste gases (see BAT 19) both at the press exit and along the press line for continuous presses. For existing multi-opening presses, the applicability of enclosing the press may be restricted due to safety reasons).	Diffuse emissions from the MDF and Chipboard press have been improved by the installation of new press abatement systems in 2013; one for each of the MDF presses and the Particleboard press. The system has been designed to reduce diffuse emissions into the press halls allowing off gases from the presses to be treated by the abatement system (Venturi Scrubbers).
23.	<p>In order to reduce diffuse dust emissions to air from the transport, handling and storage of wood materials, BAT is to set up and implement a dust management plan, as part of the environmental management system (see BAT 1) and to apply one or a combination of the techniques given below:</p> <ul style="list-style-type: none"> <li>(a) Regularly clean transport routes, storage areas and vehicles;</li> <li>(b) Unload sawdust using covered drive-through unloading areas;</li> <li>(c) Store sawdust dust-prone material in silos, containers, roofed piles, etc. or enclose bulk storage areas;</li> <li>(d) Suppress dust emissions by water sprinkling.</li> </ul>	<p><b>Currently Compliant</b></p> <p>Roadway debris is cleared regularly by a road sweeper or by use of the site's bucket loaders, or bobcat. A water bowser is used to ensure that roadways and storage areas are watered in dry weather in order to reduce diffuse emissions from vehicular movements.</p> <p>Currently, sawdust unloading is carried out on the Logyard and dust-prone materials are also stored in the open air. However, as part of the on-going project work as previously described in BAT 2 section c, unloading of materials will be in a designated, purpose-built area that will reduce potential dust emissions during off-loading. In addition, materials (other than roundwood) in the Logyard will be stored in silos that are currently under construction.</p> <p>Mist air systems are in use around the site as a last resort to reduce the likelihood of potential impact off-site from dusty operations. The Preproduction and Logyard</p>

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		areas are the main users of mist air systems and these departments are undergoing significant investment that would reduce the resilience on water sprays. Foam suppression systems are also currently being trialled and considered.
<b>Emissions to Water</b>		
24.	In order to reduce the pollution load of the collected waste water, BAT is to use both of the techniques given below:  (a) Collect, and treat separately, surface water run-off water and process waste water; (b) Store any wood except roundwood and slabs on a hard-surfaced area.	<b>Currently Compliant</b>  Surface water run-off is collected via the surface water drainage system and stored in holding lagoons prior to any discharge. Water stored in these lagoons passes through an oil skimmer and three settlement chambers before being held in a lagoon (that also acts as sedimentation settlement) where it is tested for the defined parameters within the NRW permit. In the lagoons the waters are subjected to aeration and biological treatment.  All process waste water is either collected from source in bulk containment before being sent off-site for disposal, or leaves site through consented foul sewer discharges after passing through a screening device.  The majority of the Logyard lay-down areas are concreted. All residues, sawdust and recycled material are always stored on these concreted areas and only roundwood is stored on any areas that are currently not concreted. During future

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
		site improvements, residues will be housed in silos and the entire Logyard will be concreted.
25.	In order to reduce emissions to water from surface run-off water, BAT is to use a combination of the techniques given below: <ul style="list-style-type: none"> <li>(a) Mechanical separation of coarse materials by screens and sieves as preliminary treatment;</li> <li>(b) Oil-water separation;</li> <li>(c) Removal of solids by sedimentation in retention basins or settlement tanks.</li> </ul>	<b>Currently Compliant</b>  Surface waters from the Logyard will, once the Logyard is fully concreted, pass through a mechanical screen that removes wood debris as well as silt before entering lagoon number three.  The first chamber in the lagoon inlet acts as an oil-water separator with an oil skimmer that removes any oil present into an IBC for disposal. The diesel storage tank and garage surface water collects in an oil interceptor prior to entering the lagoon inlet; this is checked regularly and cleaned out as necessary. The oil store and waste IBC area is bunded to prevent surface run-off and additional oil from entering the surface water drainage system and IBCs or drums used around site are kept on IBC bunds.  The last inlet chamber to the lagoons acts as a primary settlement tank. This effectively removes large solids from the surface waters prior to entry into one of the two lagoons. The inlet is cleaned and solid build-up removed every two months, or as needed. The lagoons themselves then act as further settlement for finer material. The lagoons are dredged once a year in summer to remove solids accumulation.

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		Supplementary information in S5 response #1 (21/01/19).  We have imposed the appropriate BAT-AEL for Total Suspended Solids from emission point W1 in Table S3.5 of the Permit.
26.	In order to prevent or reduce the generation of process waste water from wood fibre production, BAT is to maximise process water recycling. (Recycle process water from chip washing, cooking and / or refining in closed or open loops by treating it at the refiner plant level by mechanical removal of solids, in the most appropriate manner, or by evaporation).	<b>Currently Compliant</b>  Wastewater from wood fibre production is minimised by efficient use of heat exchangers to pre-heat the wash water. Cleaning systems allow the water to be re-used within the process.  Supplementary information in S5 response #1 (21/01/19).
27.	In order to reduce emissions to water from wood fibre production, BAT is to use a combination of the techniques given below:  (a) Mechanical separation of coarse materials by screens and sieves; (b) Physico-chemical separation, e.g. using sand filters, dissolved air flotation, coagulation and flocculation; (c) Biological treatment.	<b>Currently Compliant</b>  Techniques (a) and (b) are used to reduce emissions to water from wood fibre production. Additional treatment using micro filtration and reverse osmosis allows water to be reused in the site's processes.

No	Summary of BAT Conclusion requirement	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Not Compliant
28.	<p>In order to prevent or reduce the generation of waste water from wet air abatement systems that will need treatment prior to discharge, BAT is to use one or a combination of the techniques given below:</p> <ul style="list-style-type: none"> <li>(a) Sedimentation, decanting, screw and belt presses to remove collected solids in wet abatement systems;</li> <li>(b) Dissolved Air Flotation. Coagulation and flocculation followed by removal of floccules by flotation aided by dissolved air.</li> </ul>	<b>Currently Compliant</b>  Technique (a) in the form of decanters are used.