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Consulting Engineers Limited

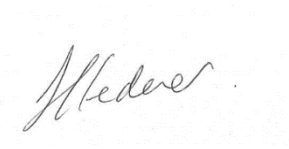
# Chirk Particleboard Facility

**Kronospan**

EP Variation

ENGINEERING CONSULTING

# Document approval

| | Name | Signature | Position | Date |
|---|---|---|---|---|
| Prepared by: | Hannah Lederer |  | Environmental Consultant | 21/06/2023 |
| Checked by: | Rosalind Flavell |  | Senior Consultant | 21/06/2023 |

# Document revision record

| Revision no | Date | Details of revisions | Prepared by | Checked by |
|---|---|---|---|---|
| R0.0 | 20/02/2023 | For Client | HKL | JRS |
| R0.1 | 28/02/2023 | Updated following Client review | HKL | RSF |
| R1.0 | 02/03/2023 | For issue to NRW | HKL | RSF |
| R2 | 21/06/2023 | Updated for typo in section 4.1 | HKL | RSF |

# Non-Technical Summary

Kronospan Limited (Kronospan) has operated a wood-based panels manufacturing facility at its site in Chirk, North Wales (the Facility) since 1971. In October 2022, a consolidated Environmental Permit (EP) (EPR/BW9999IG) was issued, which transferred the regulation of the board manufacturing processes to from Wrexham County Borough Council to Natural Resources Wales (NRW).

This further application is being submitted to apply for further changes to the emissions to air from the following emission sources:

- WESP 21; and
- A5 & A6 re-ducting.

**WESP 21**

The emission limit to air within the EP for emissions of oxides of nitrogen (NOx) from the WESP 21 is 100 mg/Nm$^3$. Kronospan may not be able to comply with the ELV from WESP 21, and understands a variation to the EP would be required to change the ELV from WESP 21. Furthermore, within any application, Kronospan would need to demonstrate that the impacts associated with any proposed ELV would not have a significant effect, alone or in combination, on European designated habitat sites.

**A5 and A6 re-ducting**

Within the Facility, the resin plant manufactures formaldehyde based resins in four reactors. The emissions from these reactors are abated via a wet scrubber, referred to as emission point A5. Emissions from the three VITS paper impregnation lines are also abated through emission point A5 and a second wet scrubber, referred to as A6.

Due to the age of the scrubbers, Kronospan is proposing to replace the NAIRB scrubbers and duct emissions from the resin reactors into WESP 32. Kronospan understands that to change the abatement for the VITS paper impregnation lines and resin reactors (currently emission points A5 and A6), it would need to apply for a variation to the EP, and the application would need to demonstrate that the impacts associated with the changes would not have a significant effect. The emissions monitoring process for A5 and A6 would also be altered, as emissions would be independently monitored from the WESP32 following abatement.

An air quality assessment has been undertaken to assess the environmental impact associated with the proposed changes. The air quality assessment has concluded that:

1. The impact of nitrogen dioxide emissions on human health can be described as not significant.
2. The change in impact of all other emissions on human health can be screened out as ‘insignificant’.
3. With regard to the impact on ecology:
    a. At all European designated sites the change in impact associated with proposals can be screened out as insignificant and the total impact of the Facility operating at the proposed ELVs can be screened out as insignificant.
    b. At River Dee and Bala Lake SAC and SSSI the description of the impact for the Facility operating at the proposed ELVs is the same as that operating at the ELVs set in the existing EP.
    c. At Chirk Castle SSSI the description of the impact for the Facility operating at the proposed ELVs is the same as that operating at the ELVs set in the existing EP.

d. At Nant-y-Belan and Prynella Woods SSSI, the change in impact can be screened out as insignificant with the exception of annual mean NOx impacts. However, the description of the impact for the Facility operating at the proposed ELVs is the same as that operating at the ELVs set in the existing EP.

e. At locally designated sites whilst impacts are high the impact is considered not significant, and the contribution of the Facility is not predicted to exceed the Critical Level when considering the conservatism in the modelling. In addition, the description of the impact for the Facility operating at the proposed ELVs is the same as that operating at the ELVs set in the existing EP.

# Contents

# 1 Introduction

Kronospan Limited (Kronospan) has operated a wood-based panels manufacturing facility at its site in Chirk, North Wales (the Facility) since 1971.

Kronospan is the global leader in the production of wood-based panels with 53 sites globally. Chirk is the sole UK site, primarily focussed on supplying the domestic market with a wide range of locally manufactured raw and added value products. The site has developed so that it is able to derive the benefit of vertical integration with a range of related industrial processes ranging from raw board production to producing laminate flooring for retail sale.

This document and the supporting appendix contain the relevant information for the variation to the Natural Resources Wales (NRW) Environmental Permit (EP). These documents should be read in conjunction with the application forms.

## 1.1 Background

In October 2022, a consolidated EP (EPR/BW9999IG) was issued, which transferred the regulation of the board manufacturing processes from Wrexham County Borough Council to NRW.

This further application is being submitted to apply for further changes to the emissions to air from the following emission sources:

- WESP 21; and
- The resin reactors and paper impregnation lines (currently via sources A5 and A5).

### 1.1.1 WESP 21

The emission limit to air within the EP for emissions of oxides of nitrogen (NOx) from the WESP 21 is 100 mg/Nm$^3$. Kronospan may not be able to comply with the ELV from WESP 21, and understands a variation to the EP would be required to change the ELV from WESP 21. Furthermore, within any application, Kronospan would need to demonstrate that the impacts associated with any proposed ELV would not have a significant effect, alone or in combination, on European designated habitat sites.

### 1.1.2 A5 and A6 re-ducting

Within the Facility, the resin plant manufactures formaldehyde based resins in four reactors. The emissions from these reactors are abated via a wet scrubber, referred to as emission point A5. Emissions from the three VITS paper impregnation lines are also abated through emission point A5 and a second wet scrubber, referred to as A6.

Due to the age of the scrubbers, and increased frequency of preventative maintenance carried out on them, Kronospan is proposing to replace the wet scrubbers, and duct emissions from the resin reactors and paper impregnation lines (which currently emit to atmosphere via emission points A5 and A6) into WESP 32. Kronospan understands that to change the abatement for the VITS paper impregnation and resin reactors, it would need to apply for a variation to the EP, and the application would need to demonstrate that the impacts associated with the changes would not have a significant effect. The emissions monitoring process for resin reactors and paper impregnation lines would also be altered, as emissions would be independently monitored from the WESP 32 following abatement.

## 1.2 Proposed Changes

Kronospan is proposing that the following changes are made to the EP for the Facility:

1. The ELV for NOx from emission point A32 (WESP21) is increased from 100 mg/Nm$^3$ to 200 mg/Nm$^3$.
2. The emissions from the resin reactor and paper impregnation lines (currently from emission points A5 and A6) are ducted to and released from emission point A28 (WESP 32).

No further changes are proposed within this application.

## 1.3 Variation

Article 12(1) of the IPPC Directive requires operators to notify the regulator of any '*change in operation*'. These are referred to as a variation to an EP.

NRW's '*Environmental Permitting Charging Scheme Guide 2021 – 2022*' (referred to as the Charging Scheme Guide) identifies the following types of EP variation:

- Administrative
- Minor technical
- Normal
- Substantial

It is acknowledged that the proposed changes will not comprise an administrative variation.

The Charging Scheme Guide provides an example for a minor technical variation as "*Adding an emission point where we do not have to carry out a technical assessment*". As a detailed air quality assessment is being submitted in support of this application, it is considered that the application does not comprise a minor technical variation, as NRW will be required to audit and carry out a technical assessment of the air quality assessment provided with the application.

NRW Guidance Regulatory Guidance Series, No RGN 8, titled '*Substantial changes in operation at installations, mining waste facilities and other facilities involving solvent and combustion*' identifies a substantial variation as:

> *… a change in operation of installations or mining waste facilities, which in our opinion may have significant negative effects on human beings or the environment. Certain changes are automatically regarded as substantial, namely:*
>
> a. *a change in operation of a Part A installation which in itself meets the thresholds, if any, set out in Part 2 of Schedule 1 EPR 4; or*
> b. *a change in operation of an incineration or co-incineration plant for non-hazardous waste which would involve the incineration or co-incineration of hazardous waste.*

Section A15.4 states:

> *"a change in operation at an installation should be considered substantial if it is likely to give rise to the need to undertake an "appropriate assessment" for the purpose of the Habitats Regulations"*

Section A15.7 states:

> *"In relation to SSSIs any permit for an operation which is likely to damage SSSI features needs to be considered and consulted upon with Natural England / NRW".*

Considering the criteria in RGN 8, the proposed changes:

- will not result in significant negative effects as explained in section 3;
- will not meet the threshold of a Part A installation;
- are not a change in operation of an incineration or co-incineration plant; or
- do not give rise to the need to undertake an appropriate assessment for the purpose of the Habitats Regulations at any European designated site.

However, the change in impact at local SSSIs cannot be screened out as insignificant and as such it is understood that the Natural England / NRW may need to be consulted with.

Therefore, the proposed changes are considered to be a substantial variation to the EP.

# 2 WESP 21 NOx limit

## 2.1 Emission Limits

### 2.1.1 Industrial Emissions Directive & BAT Conclusions

The Industrial Emissions Directive (IED), which was adopted on 7th January 2013, is the key European Directive which covers almost all regulation of industrial processes in the EU. Within the IED, the requirements of the relevant sector BREF become binding as BAT guidance, as follows.

1. Article 15, paragraph 2, of the IED requires that emission limit values are based on best available techniques, referred to as BAT.
2. Article 13 of the IED, requires that 'the Commission' develops BAT guidance documents (referred to as BREF's).
3. Article 21, paragraph 3, of the IED, requires that when updated BAT conclusions are published, the Competent Authority has up to four years to revise permits for facilities covered by that activity to comply with the requirements of the sector specific BREF.

The 'Best Available Techniques (BAT) conclusions for the Production of wood-based panels' (Reference: L 306/31) was published on the 21 November 2015, and the 'BREF for the Production of Wood-based Panels' (Reference: EUR 27732 EN) was finalised in 2016, herein referred to as the Panel board BATc. Therefore, in accordance with the requirements of the IED, the Facility is required to demonstrate compliance with the requirements of the Panel board BATc by 21 November 2018. As all of the documents were agreed prior to the UK leaving the EU, all of these requirements still apply.

Prior to the issue of the current EP consolidation and variation, Kronospan had undertaken a review of its operations against the requirements of the Panel board BATc. This included identification of a limited number of areas in which Kronospan acknowledged that improvements were required to ensure compliance with any outstanding aspects of the Panel board BATc, with timelines for implementation of actions. The review had previously been accepted by Wrexham County Borough Council (WCBC), and was submitted to NRW in May 2018, by Kronospan, as Appendix D of the EP consolidation and variation.

The BAT-associated emission levels (BAT-AELs) for emissions to air from a directly heated dryer are presented in BAT18 of the Panel board BATc. The BAT-AELs have been extracted from the Panel board BATc and are presented in Table 1:

*Table 1 - BAT-AELs for emissions to air from a directly heated dryer*

| Parameter | BAT-AEL |
|---|---|
| NOx | 30–250 mg/Nm$^3$ |

### 2.1.2 Setting ELVs

The Department for Environment, Food and Rural Affairs (Defra) has published guidance, titled '*Industrial Emissions Directive EPR Guidance on Part A installations*', dated February 2013, to set out how the requirements of the Industrial Emissions Directive (IED) should be applied and interpreted. Kronospan understands that the guidance has been adopted by Welsh Government and applies to the Facility.

Paragraph 4.35 of the Defra guidance states:

*The requirements of Article 15(3) apply only where BAT Conclusions have*

*(i) been adopted and published by the European Commission under Articles 13(5) and (6), and*

*(ii) those Conclusions contain BAT-associated emission levels. In such cases, the regulator should then set ELVs such that, under normal operating conditions, emissions do not exceed the relevant BAT-AEL.*

*Where the BAT AELs are expressed as a range, the ELV should be set on the basis of the top of the relevant BAT-AEL range – that is to say, at the highest associated emission level - unless the installation is demonstrably capable of compliance with a substantially lower ELV, based on the BAT proposed by the operator, or exceptional environmental considerations compel a tighter ELV.*

Therefore, in accordance with the Defra guidance, the upper range of the BAT-AEL should be applied if a plant/process is not able to achieve a substantially lower performance, or if, due to the sensitivity of receptors, a lower ELV would be required to ensure that impacts are not 'unacceptable'.

Whilst Kronospan is able to achieve a 'reduced ELV' for NOx, i.e. compared to the upper range of the BAT-AEL, for emissions from MDF 1 and MDF 2, it is not able to achieve the same level of environmental performance for WESP 21. This has been demonstrated by emissions testing for emissions of NOx from WESP 21.

The air quality impact associated with the proposed change in ELV for WESP 21 has been assessed, refer to section 3.

# 3 A5 and A6 re-ducting

## 3.1 Emissions abatement

The emissions from the resin reactors and paper impregnation lines are currently abated via two NAIRB scrubbers and released via emission points A5 and A6.

The WESP 32 is not currently operated as a wet scrubber; however, acts as a higher (65.5 m) dispersion point for the release of emissions from the press abatement system.

Kronospan is proposing to operate the WESP 32 as a scrubber to provide abatement of emission from the resin reactors and paper impregnation lines. Operating WESP 32 as a scrubber will also provide secondary abatement to the emissions from the press abatement system.

The re-ducting of emissions from A5 and A6 will increase the air flow through the WESP 32, which will aid dispersion as the emission will be released at a significantly greater height – 65.5 m compared to 17.5 m (A5) and 16 m (A6). The additional abatement provided to the emissions from the press abatement system will reduce the overall mass release of pollutants from the Facility. This has been modelled and results presented in section 4.1.

## 3.2 Emissions monitoring

The EP implements emission limits and monitoring requirements from the resin reactors and paper impregnation lines (currently at emission points A5 and A6). Currently, monitoring for each emission point is undertaken from sampling points located with the ducts for A5 and A6. The emission limits for the resin and paper impregnation processes are the same.

Due to the combined use of WESP 32 for emissions from the resin reactors, paper impregnation lines, and press abatement system, emissions monitoring will need to be undertaken from a new sampling point following abatement via the WESP 32. In order to undertake monitoring for emissions from the resin and paper impregnation lines, the emissions from the press abatement system would be diverted to the short stack (A31) as currently used for testing purposes.

The WESP 32 was operational up to 2019, and emissions monitoring was undertaken until this time from suitable sample points. The proposed emissions monitoring for the resin reactors and paper impregnation lines will therefore utilise the previously established emission monitoring locations, and infrastructure on the WESP 32.

Emissions from the press abatement system are monitored prior to being ducted to the WESP 32.

All monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme will have either MCERTS certification or MCERTS accreditation (as appropriate), unless otherwise agreed in writing by NRW.

## 3.3 Changes to emission point

Allowing for the removal of emission points A5 and A6 an updated emission point drawing is provided in Appendix A.

# 4 Environmental Impact

The proposed changes to the emission limits will only result in changes to the emissions to air from the Facility. Therefore, this application has only considered the air quality impacts associated with the proposed changes.

## 4.1 Air quality

An air quality assessment has been developed to consider the impact of the change in NOx emissions associated with the proposed change in ELV for A32 (WESP 21) and the impact of re-ducting the process air from the resin reactors and paper impregnation lines to A28 (WESP 32).The assessment has considered the impacts associated with NOx, total dust, volatile organic compounds, and formaldehyde emissions and deposition of nitrogen, including acid deposition.

The assessment has concluded the following:

1. With regard to the impact on human health:
    a. During normal operations, although the predicted change in nitrogen dioxide impacts cannot be screened out as 'insignificant' the total impact of the Facility operating at the proposed ELVs can be described as not significant. The same conclusion can be reached for the identified non-standard operating scenarios.
    b. the change in impact of all other pollutants can be screened out as 'insignificant'.
2. With regard to the impact on ecology, only those operating scenarios which could occur for periods of at least one day have been considered. The results have shown that:
    a. At all European Designated sites the change in impact associated with the proposed variation can be screened out as insignificant and the total impact of the Facility operating at the proposed ELVs can be screened out as insignificant.
    b. At River Dee and Bala Lake SAC and SSSI, whilst the change in impact cannot be screened out as insignificant, the description of the impact for the Facility operating at the proposed ELVs is the same as that operating at the ELVs set in the existing EP.
    c. At Chirk Castle SSSI, whilst the change in impact cannot be screened out as insignificant, the description of the impact for the Facility operating at the proposed ELVs is the same as that operating at the ELVs set in the existing EP.
    d. At Nant-y-Belan and Prynella Woods SSSI, the change in impact can be screened out as insignificant with the exception of annual mean NOx impacts. However, the description of the impact for the Facility operating at the proposed ELVs is the same as that operating at the ELVs set in the existing EP.
    e. At locally designated sites whilst impacts are high the impact is considered not significant, and the contribution of the Facility is not predicted to exceed the Critical Level when considering the conservatism in the modelling. In addition, the description of the impact for the Facility operating at the proposed ELVs is the same as that operating at the ELVs set in the existing EP.
3. Additional consideration has been made to the in-combination impact of emissions. This has shown that the inclusion of other identified sources would not have a significant impact.

# Appendices

# A Updated emissions point plan

## Natural Resources Wales Emission Points

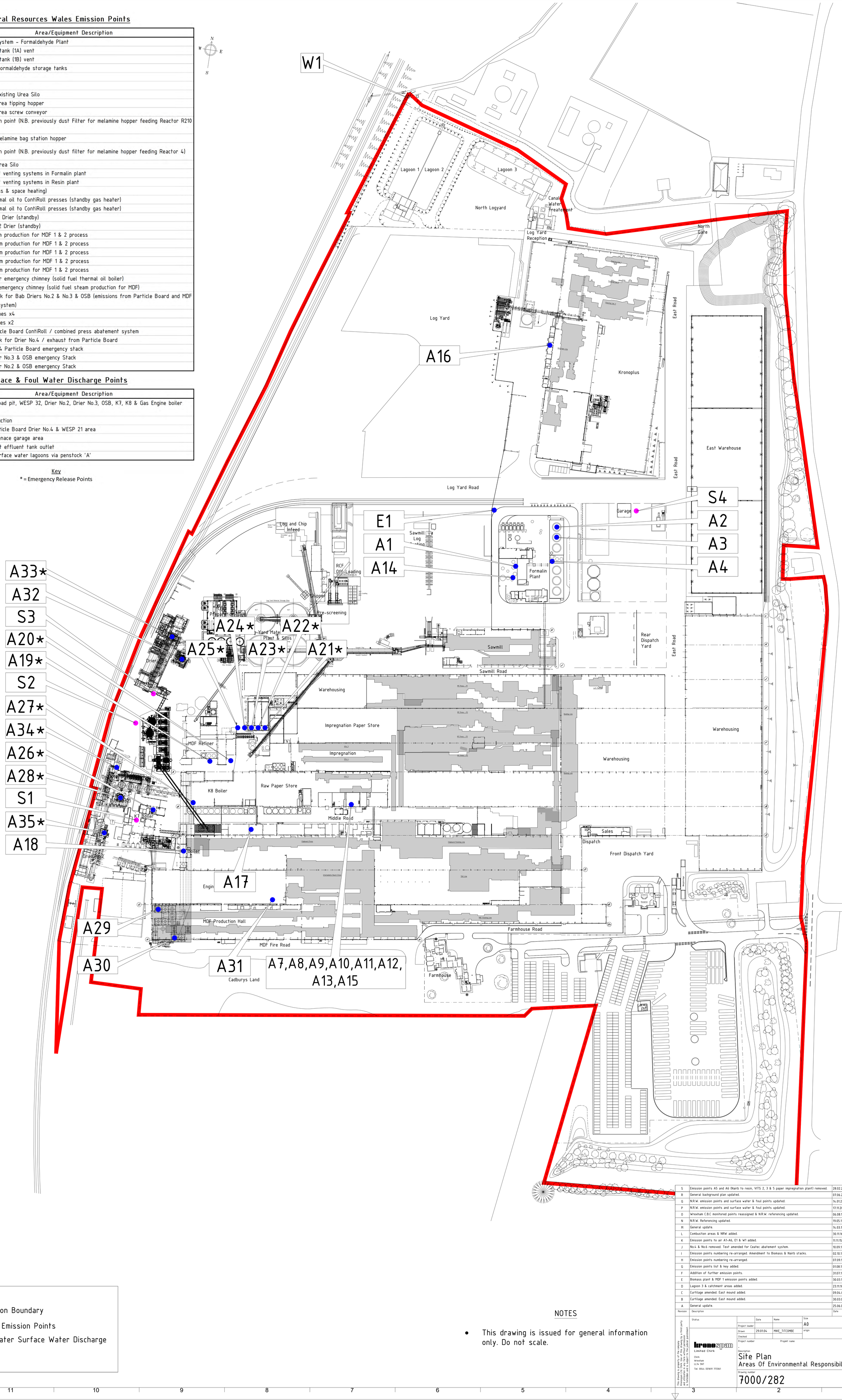
| Ref. | Area/Equipment Description |
|---|---|
| A1 | Emission control system - Formaldehyde Plant |
| A2 | Methanol storage tank (1A) vent |
| A3 | Methanol storage tank (1B) vent |
| A4 | Wet scrubber on formaldehyde storage tanks |
| A5 | Removed |
| A6 | Removed |
| A7 | Exhaust fan for existing Urea Silo |
| A8 | Exhaust fan for urea tipping hopper |
| A9 | Exhaust fan for urea screw conveyor |
| A10 | Redundant emission point (N.B. previously dust Filter for melamine hopper feeding Reactor R210 and R220) |
| A11 | Exhaust fan for melamine bag station hopper |
| A12 | Redundant emission point (N.B. previously dust filter for melamine hopper feeding Reactor 4) |
| A13 | Exhaust fan for Urea Silo |
| A14 | All pressure relief venting systems in Formalin plant |
| A15 | All pressure relief venting systems in Resin plant |
| A16 | K1 Kronoplus (press & space heating) |
| A17 | K5 Rawboard thermal oil to ContiRoll presses (standby gas heater) |
| A18 | K6 Rawboard thermal oil to ContiRoll presses (standby gas heater) |
| A19* | GT1 heat to MDF 1 Drier (standby) |
| A20* | GT2 heat to MDF 2 Drier (standby) |
| A21* | Gas Engine 1 steam production for MDF 1 & 2 process |
| A22* | Gas Engine 2 steam production for MDF 1 & 2 process |
| A23* | Gas Engine 3 steam production for MDF 1 & 2 process |
| A24* | Gas Engine 4 steam production for MDF 1 & 2 process |
| A25* | Gas Engine 5 steam production for MDF 1 & 2 process |
| A26* | K7 solid fuel boiler emergency chimney (solid fuel thermal oil boiler) |
| A27* | K8 biomass plant emergency chimney (solid fuel steam production for MDF) |
| A28 | WESP 32 unit stack for Bab Driers No.2 & No.3 & OSB (emissions from Particle Board and MDF press abatement system) |
| A29 | MDF 2 Drier Cyclones x4 |
| A30 | MDF 1 Drier Cyclones x2 |
| A31 | MDF 1 & 2 & Particle Board ContiRoll / combined press abatement system |
| A32 | WESP 21 unit stack for Drier No.4 / exhaust from Particle Board |
| A33* | WESP 21 Drier No.4 Particle Board emergency stack |
| A34* | WESP 32 Bab Drier No.3 & OSB emergency Stack |
| A35* | WESP 32 Bab Drier No.2 & OSB emergency Stack |

## Surface & Foul Water Discharge Points

| Ref. | Area/Equipment Description |
|---|---|
| S1 | Zone 1 - Middle Road pit, WESP 32, Drier No.2, Drier No.3, OSB, K7, K8 & Gas Engine boiler waters |
| S2 | Zone 2 - Preproduction |
| S3 | Zone 3 - New Particle Board Drier No.4 & WESP 21 area |
| S4 | Site vehicle maintenace garage area |
| E1 | Formaldehyde plant effluent tank outlet |
| W1 | Discharge from surface water lagoons via penstock 'A' |

Key

* = Emergency Release Points




Key:-

- Installation Boundary
- NRW Air Emission Points
- Welsh Water Surface Water Discharge

NOTES

- This drawing is issued for general information only. Do not scale.

| Revision | Description | Date | Name |
|---|---|---|---|
| S | Emission points A5 and A6 (Nairb to resin, VITS 2, 3 & 5 paper impregnation plant) removed. | 28.02.23 | M.W. |
| R | General background plan updated. | 07.06.22 | M.W. |
| Q | N.R.W. emission points and surface water & foul points updated. | 14.01.21 | M.W. |
| P | N.R.W. emission points and surface water & foul points updated. | 17.11.20 | M.W. |
| O | Wrexham C.B.C monitored points reassigned & N.R.W. referencing updated. | 06.08.19 | M.W. |
| N | N.R.W. Referencing updated. | 19.05.17 | M.W. |
| M | General update. | 14.03.17 | M.W. |
| L | Combustion areas & NRW added. | 30.11.16 | C.N. |
| K | Emission points to air A1-A6, E1 & W1 added. | 11.11.15 | M.W. |
| J | No.4 & No.6 removed. Text amended for Ceatec abatement system. | 10.09.14 | M.T. |
| I | Emission points numbering re-arranged. Amendment to Biomass & Nairb stacks. | 02.10.13 | B.H. |
| H | Emission points numbering re-arranged. | 07.09.12 | P.H. |
| G | Emission points list & key added. | 01.08.12 | M.T. |
| F | Addition of further emission points. | 31.07.12 | M.T. |
| E | Biomass plant & MDF 1 emission points added. | 30.03.12 | M.T. |
| D | Lagoon 3 & catchment areas added. | 23.11.10 | M.T. |
| C | Curtilage amended. East mound added. | 09.04.09 | M.T. |
| B | Curtilage amended. East mound added. | 30.03.06 | M.T. |
| A | General update. | 25.06.04 | M.T. |

Status

| | Date | Name |
|---|---|---|
| Project leader | | |
| Drawn | 29.01.04 | MIKE_TITCOMBE |
| Checked | | |

Size A0 | Scale 1:1000 | Norm ISO

Project number . | Projekt name

Description

# Site Plan
## Areas Of Environmental Responsibility

Drawing number 7000/282 | Index S | Sheet/Number 1/1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