

Appendix 6D

Dispersion Modelling Results – Human Health

Prepared for: Kronospan

December 2025

DNS5-4-025

1.0 RESULTS

1.1.1 As detailed in **Appendix 6C**, the following development scenarios have been considered:

- i) Baseline
- ii) Baseline + OSB
- iii) Proposed

1.1.2 For each of the above the following operating scenarios have been considered:

- i) Normal operations
- ii) MDF 2 offline
- iii) MDF 1 offline
- iv) MDF 1 and 2 offline

1.1.3 This Appendix has focussed on the impact of normal operations as this is the intended long-term operating strategy for the Kronospan panel board manufacturing facility. However, due to the differences in air quality impacts associated with the other operating scenarios these have been included as a sensitivity.

1.1.4 The following terms have been used in this Appendix:

- i) AQAL – the air quality assessment level for the protection of human health as set out in **ES Chapter 6.0 (Air Quality and Odour)**;
- ii) PC – the process contribution – i.e. the contribution from the Kronospan Facility; and
- iii) PEC – the predicted environmental concentration – i.e. the process contribution plus the background concentration.

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- 1.1.5 The background concentration used is justified in **Appendix 6B**.
- 1.1.6 The detailed results tables present the maximum impact using the five years of weather data. The results are presented for the maximum outside the installation boundary, the maximum increase in impact at any grid point outside the installation boundary.
- 1.1.7 The modelling assumes each item of plant (including all the dust units) operates at maximum capacity and emissions are at the relevant emission limit values (ELVs) (or guarantee in the case of the dust units), and in the case of particulate matter (PM) impacts the dust only consists of PM₁₀, or PM_{2.5}. As discussed in **Appendix 6C** although the Kronospan Facility operates on a 24-hour basis the operational loading of each process is well below 100%, and each source operates below the ELVs, and in some cases by a significant margin. Therefore, these results are considered to be extremely conservative.
- 1.1.8 The planning application is seeking to install a new CHP Facility which would replace the normal operation of the K7 Biomass Plant and remove the requirement to build two of the gas engines which currently have planning consent and an EP to operate.



2.0 SUMMARY

- 2.1.1 The following sections detail the maximum predicted contribution from the Kronospan Facility outside the installation boundary using each year of meteorological data. This assumes that each item of plant operates at maximum capacity and emissions are at the relevant ELVs. The impacts have been compared to the relevant AQALs. In addition, a summary table is provided which shows the details the maximum impact of the Kronospan Facility for the Baseline, Baseline + OSB, and Proposed scenarios, together with the calculated change in impact and PEC as a percentage of the relevant AQALs. The magnitude of impact is also described applying the methodology set out in **ES Chapter 6.0 (Air Quality and Odour)**.
- 2.1.2 In summary this analysis shows that the maximum impact of those substances which the driers have ELVs for (NO_x, TVOC and PM) the greatest impact is either during normal operations or when the MDF 1 drier is offline. However, for all other substances the maximum impact is predicted to occur when the MDF 2 drier is offline. This is expected as the emissions from the K8 biomass plant and K7 biomass plant or CHP Facility (depending upon the development scenario being considered) are both ducted to the MDF 1 drier which has a lower stack height than the MDF 2 drier.
- i) For normal operations the magnitude of change can be described as negligible for all substances and averaging periods.
 - ii) For the MDF 1 offline scenario the magnitude of change can be described as negligible for all substances and averaging periods.
 - iii) For the MDF 2 offline scenario the magnitude of change can be described as negligible for all substances and averaging periods with the exception of annual mean mercury and daily mean cadmium and copper impacts, for which at the point of maximum impact outside the installation boundary the magnitude of change is described as slight.



With reference to the mercury, cadmium and copper impacts, this conservatively assumes that the K8 biomass plant and CHP Facility operate continually at the ELVs for mercury and total metals and that these are not removed in the dryer process or the cyclone which is specifically designed to remove particulate matter (cadmium and copper would both be in the particulate phase) from the exhaust gases from the MDF driers. As such actual impacts are likely to be lower.



3.0 NORMAL OPERATIONS

- 3.1.1 The following tables provide the maximum contribution from the Kronospan Facility outside the installation boundary using each year of meteorological data. The impacts have been compared to the relevant AQALs. In addition, a summary table is provided which shows the details the maximum impact of the Kronospan Facility for the Baseline, Baseline + OSB, and Proposed scenarios, together with the calculated change in impact and PEC as a percentage of the relevant AQALs. In addition, the magnitude of impact is described applying the methodology set out in **ES Chapter 6.0 (Air Quality and Odour)**.
- 3.1.2 As shown, during normal operations the magnitude of change can be described as negligible for all substances and averaging periods, with the exception of annual mean PM_{2.5} impacts when including all the dust units on site for which the magnitude of change is described as slight adverse.
- 3.1.3 This assumes that all the dust units on site continually operate at the design flow rate and the ELV for total dust, and that all this is in the PM_{2.5} fraction. This is highly unlikely given that the units are not continually operated would operate below the ELVs and not all the dust would be in this fraction Under normal operations there would be no change in the emissions of PM from the site as the exhaust gases from the CHP Facility would be used in the MDF 2 drier. This impact is associated with the additional dust units required for the OBS process.
- 3.1.4 The worst-case process contribution outside the installation boundary is predicted to be 2.46% of the AQAL and the PEC is predicted to be 77.62% of the AQAL. The background PM_{2.5} concentration is the maximum mapped background concentration with 3 km of the Site. As explained in **Appendix 6B**, this also includes a grid average contribution from the Kronospan Facility and as such may be double counting some of the sources modelled. Given the total PEC is close to the 75% and the conservative assumptions in the modelling the likely magnitude of change would be described as negligible.



3.2 Metals

- 3.2.1 The K8 biomass plant has an ELV for total group 3 metals. The proposed CHP Facility will be permitted in the same way with an ELV for total group 3 metals. Group 3 metals consist of a range of metals which each have their own individual AQALs. In order to assess the impact reference has been made to the Environment Agency's metals guidance which provides a breakdown of the speciation of metals from municipal waste incinerators and waste wood co-incinerator. For the purpose of this assessment it has been assumed that the K8 biomass plant and the proposed CHP Facility would perform no worse than the maximum monitored concentration from the Environment Agency's metals guidance as a conservative assumption. This is considered highly conservative given that the monitoring shows that the maximum is an outlier, especially in the case of nickel where the maximum concentration was 0.220 mg/Nm³, the second highest being 0.135 mg/Nm³ (or 61% of the maximum monitored), and the third highest only 0.055 mg/Nm³ (or 25% of the maximum monitored).
- 3.2.2 The impact of the Baseline and the Baseline + OSB scenarios are the same as the OSB application does not change the emissions from the K8 biomass plant or the MDF driers. The summary table details the maximum impact of the Kronospan Facility for the Baseline and the Proposed scenarios, together with the calculated change in impact and PEC for the Proposed scenario as a percentage of the relevant AQALs. In addition, the magnitude of impact is described applying the methodology set out in **ES Chapter 6.0 (Air Quality and Odour)**.
- 3.2.3 As shown, during normal operations the magnitude of change can be described as negligible for all substances and averaging periods.



Table 3.1 – Results – Normal Operations – Maximum Outside Site Boundary – Permitted Facility - Baseline

| Pollutant | Averaging Period | Units | AQAL | Bg. | 2020 | 2021 | 2022 | 2023 | 2024 | Max | Max PC as % of AQAL | PEC | PEC as % of AQAL |
|-------------------|-----------------------------|-------------------|--------|-------|--------|--------|--------|--------|--------|--------|---------------------|--------|------------------|
| Nitrogen dioxide | Annual mean | µg/m ³ | 40 | 8.1 | 6.29 | 5.12 | 4.56 | 5.42 | 5.11 | 6.29 | 15.73% | 14.39 | 35.98% |
| | 99.79%ile of 1-hour means | µg/m ³ | 200 | 16.2 | 44.19 | 44.66 | 47.18 | 43.60 | 44.13 | 47.18 | 23.59% | 63.38 | 31.69% |
| TVOC | Annual mean | µg/m ³ | - | - | 10.51 | 7.51 | 7.58 | 9.10 | 8.55 | 10.51 | - | - | - |
| | Maximum daily mean | µg/m ³ | - | - | 10.63 | 7.63 | 8.18 | 9.57 | 8.73 | 10.63 | - | - | - |
| Sulphur dioxide | 99.18%ile of daily means | µg/m ³ | 125 | 3.0 | 2.07 | 1.80 | 1.78 | 2.02 | 2.30 | 2.30 | 1.84% | 5.30 | 4.24% |
| | 99.73%ile of hourly means | µg/m ³ | 350 | 3.0 | 5.57 | 4.65 | 4.96 | 4.97 | 5.45 | 5.57 | 1.59% | 8.57 | 2.45% |
| | 99.9%ile of 15-minute means | µg/m ³ | 266 | 3.0 | 6.53 | 6.58 | 7.59 | 5.73 | 6.83 | 7.59 | 2.85% | 10.59 | 3.98% |
| Carbon monoxide | Max. 8-hour rolling mean | µg/m ³ | 10,000 | 424.4 | 192.31 | 170.84 | 196.75 | 192.69 | 186.89 | 196.75 | 1.97% | 621.15 | 6.21% |
| | Maximum 1-hour mean | µg/m ³ | 30,000 | 424.4 | 272.43 | 328.43 | 335.94 | 309.60 | 334.57 | 335.94 | 1.12% | 760.34 | 2.53% |
| Hydrogen chloride | Maximum 1-hour mean | µg/m ³ | 750 | 1.5 | 1.40 | 1.71 | 1.75 | 1.60 | 1.74 | 1.75 | 0.23% | 3.27 | 0.44% |
| Hydrogen fluoride | Monthly mean | ng/m ³ | 16,000 | 2.4 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.02% | 2.35 | 14.70% |
| | Maximum 1-hour mean | µg/m ³ | 160 | 4.7 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.05% | 4.78 | 2.99% |
| Ammonia | Annual mean | µg/m ³ | 180 | 2.2 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01% | 2.22 | 1.23% |
| | Maximum 1-hour mean | µg/m ³ | 2,500 | 4.4 | 0.62 | 0.59 | 0.59 | 0.61 | 0.69 | 0.69 | 0.03% | 5.09 | 0.20% |
| Mercury | Annual mean | µg/m ³ | 250 | 5.6 | 0.50 | 0.68 | 0.46 | 0.42 | 0.65 | 0.68 | 1.14% | 6.28 | 10.47% |
| | Maximum 1-hour mean | ng/m ³ | 7,500 | 5.6 | 1.17 | 1.11 | 1.12 | 1.16 | 1.30 | 1.30 | 0.22% | 6.90 | 1.15% |
| Cadmium | Annual mean | ng/m ³ | 5 | 0.2 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.77% | 0.19 | 3.77% |
| | Maximum daily mean | ng/m ³ | 30 | 0.3 | 0.50 | 0.68 | 0.46 | 0.42 | 0.65 | 0.68 | 2.28% | 0.98 | 3.28% |
| Total metals | Annual mean | ng/m ³ | - | - | 0.58 | 0.47 | 0.43 | 0.52 | 0.48 | 0.58 | - | - | - |
| | Maximum daily mean | ng/m ³ | - | - | 7.46 | 10.27 | 6.86 | 6.33 | 9.71 | 10.27 | - | - | - |
| | Maximum 1-hour mean | ng/m ³ | - | - | 17.50 | 16.70 | 16.86 | 17.35 | 19.49 | 19.49 | - | - | - |
| Dioxins and furan | Annual mean | fg/m ³ | - | 33.0 | 0.12 | 0.09 | 0.09 | 0.10 | 0.10 | 0.12 | - | 33.11 | - |
| PCBs | Annual mean | ng/m ³ | 200 | 0.1 | 0.010 | 0.008 | 0.007 | 0.009 | 0.008 | 0.010 | 0.005% | 0.14 | 0.07% |
| | Maximum 1-hour mean | ng/m ³ | 6,000 | 0.3 | 0.29 | 0.28 | 0.28 | 0.29 | 0.32 | 0.32 | 0.01% | 0.58 | 0.01% |



| Pollutant | Averaging Period | Units | AQAL | Bg. | 2020 | 2021 | 2022 | 2023 | 2024 | Max | Max PC as % of AQAL | PEC | PEC as % of AQAL |
|--|--------------------------|-------------------|------|-----|-------|-------|-------|-------|-------|-------|---------------------|-------|------------------|
| Excluding dust units | | | | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 1.65 | 1.17 | 1.20 | 1.46 | 1.37 | 1.65 | 4.12% | 11.25 | 28.12% |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 5.61 | 4.39 | 4.76 | 5.48 | 4.80 | 5.61 | 11.22% | 15.21 | 30.42% |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 1.65 | 1.17 | 1.20 | 1.46 | 1.37 | 1.65 | 6.60 | 7.15 | 35.75% |
| Including dust units | | | | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 9.07 | 8.70 | 9.06 | 9.53 | 8.18 | 9.53 | 23.83% | 19.13 | 47.83% |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 34.95 | 32.01 | 31.30 | 37.29 | 29.36 | 37.29 | 74.58% | 46.89 | 93.78% |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 9.07 | 8.70 | 9.06 | 9.53 | 8.18 | 9.53 | 38.13% | 15.03 | 75.16% |
| Notes: | | | | | | | | | | | | | |
| * Annual mean concentration compared to the monthly mean AQAL. | | | | | | | | | | | | | |

Table 3.2 – Results – Normal Operations – Maximum Outside Site Boundary – Baseline + OSB

| Substance | Averaging Period | Units | AQAL | Bg. | 2020 | 2021 | 2022 | 2023 | 2024 | Max | Max PC as % of AQAL | PEC | PEC as % of AQAL |
|-------------------|-----------------------------|-------------------|--------|-------|--------|--------|--------|--------|--------|--------|---------------------|--------|------------------|
| Nitrogen dioxide | Annual mean | µg/m ³ | 40 | 8.1 | 7.47 | 5.22 | 5.36 | 6.49 | 6.02 | 7.47 | 18.69% | 15.57 | 38.94% |
| | 99.79%ile of 1-hour means | µg/m ³ | 200 | 16.2 | 51.89 | 52.55 | 50.77 | 52.86 | 52.71 | 52.86 | 26.43% | 69.06 | 34.53% |
| TVOC | Annual mean | µg/m ³ | - | - | 13.65 | 9.27 | 9.68 | 11.85 | 10.92 | 13.65 | - | - | - |
| | Maximum daily mean | µg/m ³ | - | - | 13.82 | 9.61 | 10.45 | 12.46 | 11.17 | 13.82 | - | - | - |
| Sulphur dioxide | 99.18%ile of daily means | µg/m ³ | 125 | 3.0 | 2.07 | 1.80 | 1.78 | 2.02 | 2.30 | 2.30 | 1.84% | 5.30 | 4.24% |
| | 99.73%ile of hourly means | µg/m ³ | 350 | 3.0 | 5.57 | 4.65 | 4.96 | 4.97 | 5.45 | 5.57 | 1.59% | 8.57 | 2.45% |
| | 99.9%ile of 15-minute means | µg/m ³ | 266 | 3.0 | 6.53 | 6.58 | 7.59 | 5.73 | 6.83 | 7.59 | 2.85% | 10.59 | 3.98% |
| Carbon monoxide | Max. 8-hour rolling mean | µg/m ³ | 10,000 | 424.4 | 192.31 | 170.84 | 196.75 | 192.69 | 186.89 | 196.75 | 1.97% | 621.15 | 6.21% |
| | Maximum 1-hour mean | µg/m ³ | 30,000 | 424.4 | 272.43 | 328.43 | 335.94 | 309.60 | 334.57 | 335.94 | 1.12% | 760.34 | 2.53% |
| Hydrogen chloride | Maximum 1-hour mean | µg/m ³ | 750 | 1.5 | 1.40 | 1.71 | 1.75 | 1.60 | 1.74 | 1.75 | 0.23% | 3.27 | 0.44% |
| Hydrogen fluoride | Monthly mean* | µg/m ³ | 16 | 2.4 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.02% | 2.35 | 14.70% |
| | Maximum 1-hour mean | µg/m ³ | 160 | 4.7 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.05% | 4.78 | 2.99% |
| Ammonia | Annual mean | µg/m ³ | 180 | 2.2 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01% | 2.22 | 1.23% |
| | Maximum 1-hour mean | µg/m ³ | 2,500 | 4.4 | 0.62 | 0.59 | 0.59 | 0.61 | 0.69 | 0.69 | 0.03% | 5.09 | 0.20% |
| Mercury | Annual mean | ng/m ³ | 250 | 5.6 | 0.50 | 0.68 | 0.46 | 0.42 | 0.65 | 0.68 | 1.14% | 6.28 | 10.47% |
| | Maximum 1-hour mean | ng/m ³ | 7,500 | 5.6 | 1.17 | 1.11 | 1.12 | 1.16 | 1.30 | 1.30 | 0.22% | 6.90 | 1.15% |
| Cadmium | Annual mean | ng/m ³ | 5 | 0.2 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.77% | 0.19 | 3.77% |
| | Maximum daily mean | ng/m ³ | 30 | 0.3 | 0.50 | 0.68 | 0.46 | 0.42 | 0.65 | 0.68 | 2.28% | 0.98 | 3.28% |
| Total metals | Annual mean | ng/m ³ | - | - | 0.58 | 0.47 | 0.43 | 0.52 | 0.48 | 0.58 | - | - | - |
| | Maximum daily mean | ng/m ³ | - | - | 7.46 | 10.27 | 6.86 | 6.33 | 9.71 | 10.27 | - | - | - |
| | Maximum 1-hour mean | ng/m ³ | - | - | 17.50 | 16.70 | 16.86 | 17.35 | 19.49 | 19.49 | - | - | - |
| Dioxins and furan | Annual mean | fg/m ³ | - | 33.0 | 0.12 | 0.09 | 0.09 | 0.10 | 0.10 | 0.12 | - | 33.11 | - |
| PCBs | Annual mean | ng/m ³ | 200 | 0.1 | 0.010 | 0.008 | 0.007 | 0.009 | 0.008 | 0.010 | 0.005% | 0.14 | 0.07% |
| | Maximum 1-hour mean | ng/m ³ | 6,000 | 0.3 | 0.29 | 0.28 | 0.28 | 0.29 | 0.32 | 0.32 | 0.005% | 0.58 | 0.01% |

| Substance | Averaging Period | Units | AQAL | Bg. | 2020 | 2021 | 2022 | 2023 | 2024 | Max | Max PC as % of AQAL | PEC | PEC as % of AQAL |
|--|--------------------------|-------------------|------|-----|-------|-------|-------|-------|-------|-------|---------------------|-------|------------------|
| Excluding dust units | | | | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 1.68 | 1.14 | 1.20 | 1.47 | 1.35 | 1.68 | 4.20% | 11.28 | 28.20% |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 5.85 | 4.54 | 4.70 | 5.80 | 4.84 | 5.85 | 11.70% | 15.45 | 30.90% |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 1.68 | 1.14 | 1.20 | 1.47 | 1.35 | 1.68 | 6.71% | 7.18 | 35.89% |
| Including dust units | | | | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 9.59 | 9.25 | 9.63 | 10.03 | 8.63 | 10.03 | 25.07% | 19.63 | 49.07% |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 36.32 | 32.73 | 32.40 | 39.05 | 31.45 | 39.05 | 78.09% | 48.65 | 97.29% |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 9.59 | 9.25 | 9.63 | 10.03 | 8.63 | 10.03 | 40.11% | 15.53 | 77.64% |
| Notes: | | | | | | | | | | | | | |
| * Annual mean concentration compared to the monthly mean AQAL. | | | | | | | | | | | | | |



Table 3.3 – Results – Normal Operations – Maximum Outside Site Boundary – Proposed

| Substance | Averaging Period | Units | AQAL | Bg. | 2020 | 2021 | 2022 | 2023 | 2024 | Max | Max PC as % of AQAL | PEC | PEC as % of AQAL |
|-------------------|-----------------------------|-------------------|--------|-------|--------|--------|--------|--------|--------|--------|---------------------|--------|------------------|
| Nitrogen dioxide | Annual mean | µg/m ³ | 40 | 8.1 | 7.47 | 5.22 | 5.35 | 6.49 | 6.02 | 7.47 | 18.67% | 15.57 | 38.92% |
| | 99.79%ile of 1-hour means | µg/m ³ | 200 | 16.2 | 62.46 | 59.64 | 50.77 | 56.53 | 52.71 | 62.46 | 31.23% | 78.66 | 39.33% |
| TVOC | Annual mean | µg/m ³ | - | - | 13.64 | 9.25 | 9.67 | 11.85 | 10.91 | 13.64 | - | - | - |
| | Maximum daily mean | µg/m ³ | - | - | 13.81 | 9.59 | 10.43 | 12.46 | 11.15 | 13.81 | - | - | - |
| Sulphur dioxide | 99.18%ile of daily means | µg/m ³ | 125 | 3.0 | 2.62 | 2.16 | 2.16 | 2.53 | 2.83 | 2.83 | 2.26% | 5.83 | 4.66% |
| | 99.73%ile of hourly means | µg/m ³ | 350 | 3.0 | 6.90 | 5.70 | 6.07 | 6.14 | 6.77 | 6.90 | 1.97% | 9.90 | 2.83% |
| | 99.9%ile of 15-minute means | µg/m ³ | 266 | 3.0 | 8.22 | 8.14 | 9.56 | 7.12 | 8.54 | 9.56 | 3.59% | 12.56 | 4.72% |
| Carbon monoxide | Max. 8-hour rolling mean | µg/m ³ | 10,000 | 424.4 | 192.31 | 170.84 | 196.75 | 192.69 | 186.89 | 196.75 | 1.97% | 621.15 | 6.21% |
| | Maximum 1-hour mean | µg/m ³ | 30,000 | 424.4 | 272.43 | 328.43 | 335.94 | 309.60 | 334.57 | 335.94 | 1.12% | 760.34 | 2.53% |
| Hydrogen chloride | Maximum 1-hour mean | µg/m ³ | 750 | 1.5 | 1.94 | 2.41 | 2.49 | 2.22 | 2.47 | 2.49 | 0.33% | 4.01 | 0.53% |
| Hydrogen fluoride | Monthly mean* | µg/m ³ | 16 | 2.4 | 0.010 | 0.007 | 0.007 | 0.010 | 0.008 | 0.010 | 0.06% | 2.36 | 14.75% |
| | Maximum 1-hour mean | µg/m ³ | 160 | 4.7 | 0.29 | 0.36 | 0.38 | 0.33 | 0.37 | 0.38 | 0.24% | 5.08 | 3.17% |
| Ammonia | Annual mean | µg/m ³ | 180 | 2.2 | 0.05 | 0.03 | 0.04 | 0.05 | 0.04 | 0.05 | 0.03% | 2.25 | 1.25% |
| | Maximum 1-hour mean | µg/m ³ | 2,500 | 4.4 | 1.45 | 1.79 | 1.84 | 1.66 | 1.83 | 1.84 | 0.07% | 6.24 | 0.25% |
| Mercury | Annual mean | ng/m ³ | 250 | 5.6 | 1.90 | 2.15 | 1.86 | 1.81 | 2.11 | 2.15 | 3.58% | 7.75 | 12.91% |
| | Maximum 1-hour mean | ng/m ³ | 7,500 | 5.6 | 5.91 | 7.42 | 7.67 | 6.78 | 7.62 | 7.67 | 1.28% | 13.27 | 2.21% |
| Cadmium | Annual mean | ng/m ³ | 5 | 0.2 | 0.21 | 0.14 | 0.15 | 0.20 | 0.17 | 0.21 | 4.27% | 0.36 | 7.27% |
| | Maximum daily mean | ng/m ³ | 30 | 0.3 | 1.90 | 2.15 | 1.86 | 1.81 | 2.11 | 2.15 | 7.16% | 2.45 | 8.16% |
| Total metals | Annual mean | ng/m ³ | - | - | 3.20 | 2.11 | 2.24 | 2.93 | 2.61 | 3.20 | - | - | - |
| | Maximum daily mean | ng/m ³ | - | - | 28.50 | 32.23 | 27.88 | 27.15 | 31.70 | 32.23 | - | - | - |
| | Maximum 1-hour mean | ng/m ³ | - | - | 88.66 | 111.33 | 115.02 | 101.67 | 114.30 | 115.02 | - | - | - |
| Dioxins and furan | Annual mean | fg/m ³ | - | 33.0 | 0.48 | 0.32 | 0.34 | 0.44 | 0.39 | 0.48 | - | 33.47 | - |
| PCBs | Annual mean | ng/m ³ | 200 | 0.1 | 0.053 | 0.035 | 0.037 | 0.049 | 0.044 | 0.053 | 0.03% | 0.18 | 0.09% |
| | Maximum 1-hour mean | ng/m ³ | 6,000 | 0.3 | 1.48 | 1.86 | 1.92 | 1.69 | 1.90 | 1.92 | 0.03% | 2.17 | 0.04% |

| Substance | Averaging Period | Units | AQAL | Bg. | 2020 | 2021 | 2022 | 2023 | 2024 | Max | Max PC as % of AQAL | PEC | PEC as % of AQAL |
|--|--------------------------|-------------------|------|-----|-------|-------|-------|-------|-------|-------|---------------------|-------|------------------|
| Excluding dust units | | | | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 1.68 | 1.14 | 1.19 | 1.47 | 1.35 | 1.68 | 4.19% | 11.28 | 28.19% |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 5.85 | 4.51 | 4.70 | 5.80 | 4.84 | 5.85 | 11.70% | 15.45 | 30.90% |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 1.68 | 1.14 | 1.19 | 1.47 | 1.35 | 1.68 | 6.71% | 7.18 | 35.89% |
| Including dust units | | | | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 9.59 | 9.25 | 9.63 | 10.02 | 8.63 | 10.02 | 25.06% | 19.62 | 49.06% |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 36.32 | 32.72 | 32.40 | 39.05 | 31.45 | 39.05 | 78.09% | 48.65 | 97.29% |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 9.59 | 9.25 | 9.63 | 10.02 | 8.63 | 10.02 | 40.10% | 15.52 | 77.62% |
| Notes: | | | | | | | | | | | | | |
| * Annual mean concentration compared to the monthly mean AQAL. | | | | | | | | | | | | | |



Table 3.4 – Results – Normal Operations – Maximum Outside Site Boundary – Summary

| Substance | Averaging Period | Units | AQAL | Bg. | Permitted | OSB | Proposed | Impact as % of AQAL | PEC as % of AQAL | Magnitude of Change |
|-------------------|-----------------------------|-------------------|--------|-------|-----------|--------|----------|---------------------|------------------|---------------------|
| Nitrogen dioxide | Annual mean | µg/m ³ | 40 | 8.1 | 6.29 | 7.47 | 7.47 | 2.9% | 38.9% | Negligible |
| | 99.79%ile of 1-hour means | µg/m ³ | 200 | 16.2 | 47.18 | 52.86 | 62.46 | 7.6% | 39.3% | Negligible |
| TVOC | Annual mean | µg/m ³ | - | - | 10.51 | 13.65 | 13.64 | - | - | - |
| | Maximum daily mean | µg/m ³ | - | - | 10.63 | 13.82 | 13.81 | - | - | - |
| Sulphur dioxide | 99.18%ile of daily means | µg/m ³ | 125 | 3.0 | 2.30 | 2.30 | 2.83 | 0.4% | 4.7% | Negligible |
| | 99.73%ile of hourly means | µg/m ³ | 350 | 3.0 | 5.57 | 5.57 | 6.90 | 0.4% | 2.8% | Negligible |
| | 99.9%ile of 15-minute means | µg/m ³ | 266 | 3.0 | 7.59 | 7.59 | 9.56 | 0.7% | 4.7% | Negligible |
| Carbon monoxide | Max. 8-hour rolling mean | µg/m ³ | 10,000 | 424.4 | 196.75 | 196.75 | 196.75 | 0.0% | 6.2% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 30,000 | 424.4 | 335.94 | 335.94 | 335.94 | 0.0% | 2.5% | Negligible |
| Hydrogen chloride | Maximum 1-hour mean | µg/m ³ | 750 | 1.5 | 1.75 | 1.75 | 2.49 | 0.1% | 0.5% | Negligible |
| Hydrogen fluoride | Monthly mean* | µg/m ³ | 16 | 2.4 | 0.002 | 0.002 | 0.010 | 0.05% | 14.8% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 160 | 4.7 | 0.08 | 0.08 | 0.38 | 0.2% | 3.2% | Negligible |
| Ammonia | Annual mean | µg/m ³ | 180 | 2.2 | 0.02 | 0.02 | 0.05 | 0.02% | 1.3% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 2,500 | 4.4 | 0.69 | 0.69 | 1.84 | 0.05% | 0.2% | Negligible |
| Mercury | Maximum daily mean | ng/m ³ | 250 | 5.6 | 0.68 | 0.68 | 2.15 | 2.4% | 12.9% | Negligible |
| | Maximum 1-hour mean | ng/m ³ | 7,500 | 5.6 | 1.30 | 1.30 | 7.67 | 1.1% | 2.2% | Negligible |
| Cadmium | Annual mean | ng/m ³ | 5 | 0.2 | 0.04 | 0.04 | 0.21 | 3.5% | 7.3% | Negligible |
| | Maximum daily mean | ng/m ³ | 30 | 0.3 | 0.68 | 0.68 | 2.15 | 4.9% | 8.2% | Negligible |
| Total metals | Annual mean | ng/m ³ | - | - | 0.58 | 0.58 | 3.20 | - | - | - |
| | Maximum daily mean | ng/m ³ | - | - | 10.27 | 10.27 | 32.23 | - | - | - |
| | Maximum 1-hour mean | ng/m ³ | - | - | 19.49 | 19.49 | 115.02 | - | - | - |
| Dioxins and furan | Annual mean | fg/m ³ | - | 33.0 | 0.12 | 0.12 | 0.48 | - | - | - |
| PCBs | Annual mean | ng/m ³ | 200 | 0.1 | 0.01 | 0.01 | 0.05 | 0.02% | 0.09% | Negligible |
| | Maximum 1-hour mean | ng/m ³ | 6,000 | 0.3 | 0.32 | 0.32 | 1.92 | 0.03% | 0.04% | Negligible |

| Substance | Averaging Period | Units | AQAL | Bg. | Permitted | OSB | Proposed | Impact as % of AQAL | PEC as % of AQAL | Magnitude of Change |
|--|--------------------------|-------------------|------|-----|-----------|-------|----------|---------------------|------------------|---------------------|
| Excluding dust units | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 1.65 | 1.68 | 1.68 | 0.07% | 28.19% | Negligible |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 5.61 | 5.85 | 5.85 | 0.48% | 30.90% | Negligible |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 1.65 | 1.68 | 1.68 | 0.14% | 35.89% | Negligible |
| Including dust units | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 9.53 | 10.03 | 10.02 | 1.23% | 49.06% | Negligible |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 37.29 | 39.05 | 39.05 | 3.51% | 97.29% | Negligible |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 9.53 | 10.03 | 10.02 | 2.46% | 77.62% | Slight |
| Notes: | | | | | | | | | | |
| * Annual mean concentration compared to the monthly mean AQAL. | | | | | | | | | | |

Table 3.5 – Results – Normal Operations – Maximum Outside Site Boundary – Metals – Long Term

| Substance | AQAL (ng/m ³) | Background Conc. (ng/m ³) | Emissions as % of ELV | Baseline (ng/m ³) | Proposed (ng/m ³) | Change in Impact (ngm ³) | Change in Impact (as % of AQAL) | Proposed PEC (as % of AQAL) | Magnitude of Impact |
|---------------|---------------------------|---------------------------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------|
| Arsenic | 6 | 0.81 | 8.3% | 0.05 | 0.27 | 0.22 | 3.7% | 18.0% | Negligible |
| Antimony | 5,000 | 1.30 | 3.8% | 0.02 | 0.12 | 0.10 | 0.002% | 0.028% | Negligible |
| Chromium | - | 0.82 | 30.7% | 0.18 | 0.98 | 0.81 | - | - | - |
| Chromium (VI) | 0.25 | 0.16 | 0.04% | 0.0002 | 0.0014 | 0.0011 | 0.5% | 66.2% | Negligible |
| Cobalt | - | 0.06 | 1.9% | 0.01 | 0.06 | 0.05 | - | - | - |
| Copper | - | 4.70 | 9.7% | 0.06 | 0.31 | 0.25 | - | - | - |
| Lead | 250 | 5.70 | 16.8% | 0.10 | 0.54 | 0.44 | 0.2% | 2.5% | Negligible |
| Manganese | 150 | 3.70 | 20.0% | 0.12 | 0.64 | 0.53 | 0.4% | 2.9% | Negligible |
| Nickel | 20 | 0.81 | 12.2% | 0.07 | 0.39 | 0.32 | 1.6% | 6.0% | Negligible |
| Vanadium | - | 1.20 | 2.0% | 0.01 | 0.06 | 0.05 | - | - | Negligible |

Table 3.6 – Results – Normal Operations – Maximum Outside Site Boundary – Metals – Short Term

| Substance | AQAL (ng/m ³) | Background conc. (ng/m ³) | Emissions as % of ELV | Baseline (ng/m ³) | Proposed (ng/m ³) | Change in impact (ngm ³) | Change in impact (as % of AQAL) | Proposed PEC (as % of AQAL) | Magnitude of impact |
|---------------|---------------------------|---------------------------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------|
| Arsenic | - | 1.62 | 8.3% | 1.62 | 2.69 | 1.06 | - | - | - |
| Antimony | 150,000 | 2.60 | 3.8% | 0.75 | 1.24 | 0.49 | 0.0003% | 0.0026% | Negligible |
| Chromium* | 2,000 | 1.64 | 30.7% | 3.15 | 9.89 | 6.74 | 0.3% | 0.6% | Negligible |
| Chromium (VI) | - | 0.33 | 0.0% | 0.01 | 0.01 | 0.01 | - | - | - |
| Cobalt | - | 0.12 | 1.9% | 0.36 | 0.60 | 0.24 | - | - | - |
| Copper* | 50 | 9.40 | 9.7% | 0.99 | 3.12 | 2.12 | 4.2% | 25.0% | Negligible |
| Lead | - | 11.40 | 16.8% | 3.27 | 5.40 | 2.14 | - | - | - |
| Manganese | 1,500,000 | 7.40 | 20.0% | 3.90 | 6.45 | 2.55 | 0.0002% | 0.0009% | Negligible |
| Nickel | 700 | 1.62 | 73.3% | 14.29 | 23.64 | 9.35 | 1.3% | 3.6% | Negligible |
| Vanadium* | 1,000 | 2.40 | 2.0% | 0.21 | 0.64 | 0.44 | 0.04% | 0.30% | Negligible |

Notes:

All impacts maximum 1-hour concentration with the exception of those marked with an * which are the maximum daily mean concentration.

4.0 MDF 1 OFFLINE

- 4.1.1 The following tables provide a summary of the maximum contribution from the Kronospan Facility outside the installation boundary using the five years of meteorological data. The impacts have been compared to the relevant AQALs. In addition, a summary table is provided which shows the details the maximum impact of the Kronospan Facility for the Baseline, Baseline + OSB, and Proposed scenarios, together with the calculated change in impact and PEC as a percentage of the relevant AQALs. In addition, the magnitude of impact is described applying the methodology set out in **ES Chapter 6.0 (Air Quality and Odour)**.
- 4.1.2 As shown, when MDF 1 is offline the magnitude of change can be described as negligible for all substances and averaging periods with the exception of annual mean PM_{2.5} impacts when including all the dust units on site for which the magnitude of change is described as slight adverse.
- 4.1.3 This assumes that all the dust units on site continually operate at the design flow rate and the ELV for total dust, and that all this is in the PM_{2.5} fraction. This is highly unlikely given that the units are not continually operated would operate below the ELVs and not all the dust would be in this fraction Under normal operations there would be no change in the emissions of PM from the site as the exhaust gases from the CHP Facility would be used in the MDF 2 drier. This impact is associated with the additional dust units required for the OBS process.
- 4.1.4 The worst-case process contribution outside the installation boundary is predicted to be 2.46% of the AQAL and the PEC is predicted to be 77.58% of the AQAL. The background PM_{2.5} concentration is the maximum mapped background concentration with 3 km of the Site. As explained in **Appendix 6B**, this also includes a grid average contribution from the Kronospan Facility and as such may be double counting some of the sources modelled. Given the total PEC is close to the 75% and the conservative assumptions in the modelling the likely magnitude of change would be described as negligible.



4.2 Metals

- 4.2.1 The summary table details the maximum impact of the Kronospan Facility for the Baseline and the Proposed scenarios, together with the calculated change in impact and PEC for the Proposed scenario as a percentage of the relevant AQALs. In addition, the magnitude of impact is described applying the methodology set out in **ES Chapter 6.0 (Air Quality and Odour)**.
- 4.2.2 As shown, when MDF 1 is offline the magnitude of change can be described as negligible for all substances and averaging periods.



Table 4.2 – Results – MDF 1 Offline – Maximum Outside Site Boundary – Summary

| Substance | Averaging Period | Units | AQAL | Bg. | Baseline | Baseline + OSB | Proposed | Impact as % of AQAL | PEC as % of AQAL | Magnitude of Change |
|-------------------|-----------------------------|-------------------|--------|-------|----------|----------------|----------|---------------------|------------------|---------------------|
| Nitrogen dioxide | Annual mean | µg/m ³ | 40 | 8.1 | 5.16 | 6.34 | 6.33 | 2.9% | 36.1% | Negligible |
| | 99.79%ile of 1-hour means | µg/m ³ | 200 | 16.2 | 47.18 | 47.18 | 62.46 | 7.6% | 39.3% | Negligible |
| TVOC | Annual mean | µg/m ³ | - | - | 8.56 | 11.70 | 11.69 | - | - | - |
| | Maximum daily mean | µg/m ³ | - | - | 8.67 | 11.86 | 11.85 | - | - | - |
| Sulphur dioxide | 99.18%ile of daily means | µg/m ³ | 125 | 3.0 | 1.80 | 2.08 | 2.36 | 0.4% | 4.3% | Negligible |
| | 99.73%ile of hourly means | µg/m ³ | 350 | 3.0 | 4.41 | 5.09 | 5.77 | 0.4% | 2.5% | Negligible |
| | 99.9%ile of 15-minute means | µg/m ³ | 266 | 3.0 | 6.44 | 7.44 | 8.42 | 0.7% | 4.3% | Negligible |
| Carbon monoxide | Max. 8-hour rolling mean | µg/m ³ | 10,000 | 424.4 | 117.51 | 117.51 | 117.51 | 0.0% | 5.4% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 30,000 | 424.4 | 240.48 | 240.48 | 240.48 | 0.0% | 2.2% | Negligible |
| Hydrogen chloride | Maximum 1-hour mean | µg/m ³ | 750 | 1.5 | 1.59 | 1.87 | 2.32 | 0.1% | 0.5% | Negligible |
| Hydrogen fluoride | Monthly mean* | µg/m ³ | 16 | 2.4 | 0.002 | 0.002 | 0.010 | 0.05% | 14.7% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 160 | 4.7 | 0.06 | 0.08 | 0.37 | 0.2% | 3.2% | Negligible |
| Ammonia | Annual mean | µg/m ³ | 180 | 2.2 | 0.01 | 0.02 | 0.04 | 0.02% | 1.2% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 2,500 | 4.4 | 0.34 | 0.69 | 1.70 | 0.1% | 0.2% | Negligible |
| Mercury | Maximum daily mean | ng/m ³ | 250 | 5.6 | 0.32 | 0.32 | 1.77 | 2.4% | 12.3% | Negligible |
| | Maximum 1-hour mean | ng/m ³ | 7,500 | 5.6 | 1.32 | 1.32 | 7.28 | 1.0% | 2.1% | Negligible |
| Cadmium | Annual mean | ng/m ³ | 5 | 0.2 | 0.04 | 0.04 | 0.19 | 3.2% | 6.9% | Negligible |
| | Maximum daily mean | ng/m ³ | 30 | 0.3 | 0.32 | 0.32 | 1.77 | 4.8% | 6.9% | Negligible |
| Total metals | Annual mean | ng/m ³ | - | - | 0.53 | 0.53 | 2.89 | - | - | - |
| | Maximum daily mean | ng/m ³ | - | - | 4.83 | 4.83 | 26.58 | - | - | - |
| | Maximum 1-hour mean | ng/m ³ | - | - | 19.86 | 19.86 | 109.24 | - | - | - |
| Dioxins and furan | Annual mean | fg/m ³ | - | 33.0 | 0.11 | 0.11 | 0.42 | - | - | - |
| PCBs | Annual mean | ng/m ³ | 200 | 0.1 | 0.009 | 0.009 | 0.048 | 0.02% | 0.09% | Negligible |
| | Maximum 1-hour mean | ng/m ³ | 6,000 | 0.3 | 0.33 | 0.33 | 1.82 | 0.02% | 0.03% | Negligible |

| Substance | Averaging Period | Units | AQAL | Bg. | Baseline | Baseline + OSB | Proposed | Impact as % of AQAL | PEC as % of AQAL | Magnitude of Change |
|--|--------------------------|-------------------|------|-----|----------|-------------------|----------|------------------------|---------------------|------------------------|
| Including dust units | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 1.32 | 1.35 | 1.35 | 0.07% | 27.38% | Negligible |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 4.58 | 4.71 | 4.71 | 0.25% | 28.61% | Negligible |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 1.32 | 1.35 | 1.35 | 0.13% | 34.26% | Negligible |
| Excluding dust units | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 9.52 | 10.02 | 10.02 | 1.23% | 49.04% | Negligible |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 37.29 | 39.05 | 39.05 | 3.51% | 97.29% | Negligible |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 9.52 | 10.02 | 10.02 | 2.46% | 77.58% | Slight |
| Notes: * Annual mean concentration compared to the monthly mean AQAL. | | | | | | | | | | |

Table 4.2 – Results – MDF 1 Offline – Maximum Outside Site Boundary – Metals – Long Term

| Substance | AQAL (ng/m ³) | Background Conc. (ng/m ³) | Emissions as % of ELV | Baseline (ng/m ³) | Proposed (ng/m ³) | Change in Impact (ngm ³) | Change in Impact (as % of AQAL) | Proposed PEC (as % of AQAL) | Magnitude of Impact |
|---------------|---------------------------|---------------------------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------|
| Arsenic | 6 | 0.81 | 8.3% | 0.04 | 0.24 | 0.20 | 3.3% | 17.5% | Negligible |
| Antimony | 5,000 | 1.30 | 3.8% | 0.02 | 0.11 | 0.09 | 0.002% | 0.028% | Negligible |
| Chromium | - | 0.82 | 30.7% | 0.16 | 0.89 | 0.73 | - | - | - |
| Chromium (VI) | 0.25 | 0.16 | 0.04% | 0.0002 | 0.0013 | 0.0010 | 0.4% | 66.1% | Negligible |
| Cobalt | - | 0.06 | 1.9% | 0.01 | 0.05 | 0.04 | - | - | - |
| Copper | - | 4.70 | 9.7% | 0.05 | 0.28 | 0.23 | - | - | - |
| Lead | 250 | 5.70 | 16.8% | 0.09 | 0.48 | 0.40 | 0.2% | 2.5% | Negligible |
| Manganese | 150 | 3.70 | 20.0% | 0.11 | 0.58 | 0.47 | 0.3% | 2.9% | Negligible |
| Nickel | 20 | 0.81 | 12.2% | 0.06 | 0.35 | 0.29 | 1.4% | 5.8% | Negligible |
| Vanadium | - | 1.20 | 2.0% | 0.01 | 0.06 | 0.05 | - | - | - |

Table 3.3 – Results – MDF 1 Offline – Maximum Outside Site Boundary – Metals – Short Term

| Substance | AQAL (ng/m ³) | Background Conc. (ng/m ³) | Emissions as % of ELV | Baseline (ng/m ³) | Proposed (ng/m ³) | Change in Impact (ngm ³) | Change in Impact (as % of AQAL) | Proposed PEC (as % of AQAL) | Magnitude of Impact |
|---------------|---------------------------|---------------------------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------|
| Arsenic | - | 1.62 | 8.3% | 1.66 | 2.22 | 0.56 | - | - | Negligible |
| Antimony | 150,000 | 2.60 | 3.8% | 0.76 | 1.02 | 0.26 | 0.0002% | 0.0024% | Negligible |
| Chromium* | 2,000 | 1.64 | 30.7% | 1.48 | 8.15 | 6.67 | 0.3% | 0.5% | Negligible |
| Chromium (VI) | - | 0.33 | 0.04% | 0.01 | 0.01 | 0.003 | - | - | - |
| Cobalt | - | 0.12 | 1.9% | 0.37 | 0.50 | 0.13 | - | - | - |
| Copper* | 50 | 9.40 | 9.7% | 0.47 | 2.57 | 2.10 | 4.2% | 23.9% | Negligible |
| Lead | - | 11.40 | 16.8% | 3.33 | 4.46 | 1.13 | - | - | - |
| Manganese | 1,500,000 | 7.40 | 20.0% | 3.97 | 5.32 | 1.34 | 0.0001% | 0.0008% | Negligible |
| Nickel | 700 | 1.62 | 73.3% | 14.56 | 19.50 | 4.93 | 0.7% | 3.0% | Negligible |
| Vanadium* | 1,000 | 2.40 | 2.0% | 0.10 | 0.53 | 0.44 | 0.04% | 0.29% | Negligible |

Notes:

All impacts maximum 1-hour concentration with the exception of those marked with an * which are the maximum daily mean concentration.



5.0 MDF 2 OFFLINE

- 5.1.1 As shown, when MDF 2 is offline the magnitude of change can be described as negligible for all substances and averaging periods with the exception of daily mean cadmium impacts, which at the point of maximum impact outside the installation boundary the magnitude of change is described as slight.
- 5.1.2 Using the initial screening assumption that both the K8 biomass plant and the CHP Facility continually operate at the relevant ELV which is expressed as total cadmium and thallium, that the emissions only consist of cadmium, and these vent to atmosphere via the MDF 1 drier, the maximum change impact would be 11.4% of the daily mean AQAL for cadmium and the PEC is predicted to be 14.7% of the AQAL.
- 5.1.3 The CHP Facility would process a similar feedstock to the existing K8 biomass plant. Monitoring from the K8 biomass plant has shown that the concentration of cadmium is typically well below the limit of detection. Since the end of 2020 there have been three of the quarterly monitoring reports which have recorded concentrations greater than the limit of detection, and the maximum of these was 9.2% of the ELV. If it is conservatively assumed that the emissions of cadmium from the K8 biomass plant and the CHP Facility are 50% of the ELV for total cadmium and thallium, the change in impact would be described as negligible.
- 5.1.4 Given the conservatism in the dispersion modelling assumptions, and the fact typically emissions from the CHP Facility would be used in the MDF 2 drier, it is considered that the magnitude of change would be described as negligible, with the exception of annual mean PM_{2.5} impacts when including all the dust units on site for which the magnitude of change is described as slight adverse.
- 5.1.5 This assumes that all the dust units on site continually operate at the design flow rate and the ELV for total dust, and that all this is in the PM_{2.5} fraction. This is highly unlikely given that the units are not continually operated would operate below the ELVs and not all the dust would be in this fraction Under normal operations there would be no change in the emissions of PM from the site as the exhaust gases from the CHP Facility would be used in the MDF 2 drier. This impact is associated with the additional dust units required for the OBS process.

- 5.1.6 The worst-case process contribution outside the installation boundary is predicted to be 2.46% of the AQAL and the PEC is predicted to be 77.60% of the AQAL. The background PM_{2.5} concentration is the maximum mapped background concentration with 3 km of the Site. As explained in **Appendix 6B**, this also includes a grid average contribution from the Kronospan Facility and as such may be double counting some of the sources modelled. Given the total PEC is close to the 75% and the conservative assumptions in the modelling the likely magnitude of change would be described as negligible.

5.2 Metals

- 5.2.1 The summary table details the maximum impact of the Kronospan Facility for the Baseline and the Proposed scenarios, together with the calculated change in impact and PEC for the Proposed scenario as a percentage of the relevant AQALs. In addition, the magnitude of impact is described applying the methodology set out in **ES Chapter 6.0 (Air Quality and Odour)**.
- 5.2.2 As shown, when MDF 2 is offline the magnitude of change can be described as negligible for all substances and averaging periods.

Table 5.3 – Results – MDF 2 Offline – Maximum Outside Site Boundary – Summary

| Substance | Averaging Period | Units | AQAL | Bg. | Baseline | Baseline + OSB | Proposed | Impact as % of AQAL | PEC as % of AQAL | Magnitude of Change |
|-------------------|-----------------------------|-------------------|--------|-------|----------|----------------|----------|---------------------|------------------|---------------------|
| Nitrogen dioxide | Annual mean | µg/m ³ | 40 | 8.1 | 5.52 | 6.15 | 5.37 | -0.4% | 33.7% | Negligible |
| | 99.79%ile of 1-hour means | µg/m ³ | 200 | 16.2 | 47.39 | 47.60 | 62.45 | 7.5% | 39.3% | Negligible |
| TVOC | Annual mean | µg/m ³ | - | - | 7.48 | 10.04 | 10.03 | - | - | - |
| | Maximum daily mean | µg/m ³ | - | - | 7.26 | 10.15 | 10.14 | - | - | - |
| Sulphur dioxide | 99.18%ile of daily means | µg/m ³ | 125 | 3.0 | 3.53 | 3.53 | 4.46 | 0.8% | 6.0% | Negligible |
| | 99.73%ile of hourly means | µg/m ³ | 350 | 3.0 | 7.31 | 7.31 | 9.25 | 0.6% | 3.5% | Negligible |
| | 99.9%ile of 15-minute means | µg/m ³ | 266 | 3.0 | 8.32 | 8.32 | 10.54 | 0.8% | 5.1% | Negligible |
| Carbon monoxide | Max. 8-hour rolling mean | µg/m ³ | 10,000 | 424.4 | 92.62 | 92.62 | 92.62 | 0.0% | 5.2% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 30,000 | 424.4 | 118.40 | 118.40 | 131.12 | 0.0% | 1.9% | Negligible |
| Hydrogen chloride | Maximum 1-hour mean | µg/m ³ | 750 | 1.5 | 1.83 | 1.83 | 2.83 | 0.1% | 0.6% | Negligible |
| Hydrogen fluoride | Monthly mean* | µg/m ³ | 16 | 2.4 | 0.003 | 0.003 | 0.011 | 0.05% | 14.8% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 160 | 4.7 | 0.09 | 0.09 | 0.42 | 0.2% | 3.2% | Negligible |
| Ammonia | Annual mean | µg/m ³ | 180 | 2.2 | 0.02 | 0.02 | 0.06 | 0.02% | 1.3% | Negligible |
| | Maximum 1-hour mean | µg/m ³ | 2,500 | 4.4 | 0.69 | 0.69 | 2.10 | 0.1% | 0.3% | Negligible |
| Mercury | Maximum daily mean | ng/m ³ | 250 | 5.6 | 0.68 | 0.68 | 4.11 | 5.7% | 16.2% | Negligible |
| | Maximum 1-hour mean | ng/m ³ | 7,500 | 5.6 | 1.30 | 1.30 | 8.63 | 1.2% | 2.4% | Negligible |
| Cadmium | Annual mean | ng/m ³ | 5 | 0.2 | 0.04 | 0.04 | 0.23 | 3.8% | 7.6% | Negligible |
| | Maximum daily mean | ng/m ³ | 30 | 0.3 | 0.68 | 0.68 | 4.11 | 11.4% | 14.7% | Slight |
| Total metals | Annual mean | ng/m ³ | - | - | 0.58 | 0.58 | 3.46 | - | - | - |
| | Maximum daily mean | ng/m ³ | - | - | 10.27 | 10.27 | 61.60 | - | - | - |
| | Maximum 1-hour mean | ng/m ³ | - | - | 19.49 | 19.49 | 129.49 | - | - | - |
| Dioxins and furan | Annual mean | fg/m ³ | - | 33.0 | 0.12 | 0.12 | 0.52 | - | - | - |
| PCBs | Annual mean | ng/m ³ | 200 | 0.1 | 0.010 | 0.010 | 0.058 | 0.02% | 0.09% | Negligible |
| | Maximum 1-hour mean | ng/m ³ | 6,000 | 0.3 | 0.32 | 0.32 | 2.16 | 0.03% | 0.04% | Negligible |

| Substance | Averaging Period | Units | AQAL | Bg. | Baseline | Baseline + OSB | Proposed | Impact as % of AQAL | PEC as % of AQAL | Magnitude of Change |
|--|--------------------------|-------------------|------|-----|----------|----------------|----------|---------------------|------------------|---------------------|
| Including dust units | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 1.05 | 1.08 | 1.07 | 0.07% | 26.69% | Negligible |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 5.13 | 3.66 | 3.66 | -2.95% | 26.51% | Negligible |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 1.05 | 1.08 | 1.07 | 0.13% | 32.87% | Negligible |
| Excluding dust units | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 9.53 | 10.02 | 10.02 | 1.23% | 49.05% | Negligible |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 37.29 | 39.05 | 39.05 | 3.51% | 97.29% | Negligible |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 9.53 | 10.02 | 10.02 | 2.46% | 77.60% | Small |
| Notes: | | | | | | | | | | |
| * Annual mean concentration compared to the monthly mean AQAL. | | | | | | | | | | |

Table 5.2 – Results – MDF 2 Offline – Maximum Outside Site Boundary – Metals – Long Term

| Substance | AQAL (ng/m ³) | Background Conc. (ng/m ³) | Emissions as % of ELV | Baseline (ng/m ³) | Proposed (ng/m ³) | Change in Impact (ngm ³) | Change in impact (as % of AQAL) | Proposed PEC (as % of AQAL) | Magnitude of Impact |
|---------------|---------------------------|---------------------------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------|
| Arsenic | 6 | 0.81 | 8.3% | 0.05 | 0.29 | 0.24 | 4.0% | 18.3% | Negligible |
| Antimony | 5,000 | 1.30 | 3.8% | 0.02 | 0.13 | 0.11 | 0.002% | 0.029% | Negligible |
| Chromium | - | 0.82 | 30.7% | 0.18 | 1.06 | 0.88 | - | - | - |
| Chromium (VI) | 0.25 | 0.16 | 0.04% | 0.0002 | 0.0015 | 0.0012 | 0.5% | 66.2% | Negligible |
| Cobalt | - | 0.06 | 1.9% | 0.01 | 0.06 | 0.05 | - | - | - |
| Copper | - | 4.70 | 9.7% | 0.06 | 0.33 | 0.28 | - | - | - |
| Lead | 250 | 5.70 | 16.8% | 0.10 | 0.58 | 0.48 | 0.2% | 2.5% | Negligible |
| Manganese | 150 | 3.70 | 20.0% | 0.12 | 0.69 | 0.58 | 0.4% | 2.9% | Negligible |
| Nickel | 20 | 0.81 | 12.2% | 0.07 | 0.42 | 0.35 | 1.8% | 6.2% | Negligible |
| Vanadium | - | 1.20 | 2.0% | 0.01 | 0.07 | 0.06 | - | - | - |



Table 5.3 – Results – MDF 2 Offline – Maximum Outside Site Boundary – Metals – Short Term

| Substance | AQAL (ng/m ³) | Background Conc. (ng/m ³) | Emissions as % of ELV | Baseline (ng/m ³) | Proposed (ng/m ³) | Change in Impact (ngm ³) | Change in Impact (as % of AQAL) | Proposed PEC (as % of AQAL) | Magnitude of Impact |
|---------------|---------------------------|---------------------------------------|-----------------------|-------------------------------|-------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------|
| Arsenic | - | 1.62 | 8.3% | 1.62 | 5.13 | 3.51 | - | - | - |
| Antimony | 150,000 | 2.60 | 3.8% | 0.75 | 2.36 | 1.61 | 0.0011% | 0.0033% | Negligible |
| Chromium* | 2,000 | 1.64 | 30.7% | 3.15 | 18.89 | 15.74 | 0.8% | 1.0% | Negligible |
| Chromium (VI) | - | 0.33 | 0.0% | 0.01 | 0.03 | 0.018 | - | - | - |
| Cobalt | - | 0.12 | 1.9% | 0.36 | 1.15 | 0.79 | - | - | - |
| Copper* | 50 | 9.40 | 9.7% | 0.99 | 5.95 | 4.96 | 9.9% | 30.7% | Negligible |
| Lead | - | 11.40 | 16.8% | 3.27 | 10.33 | 7.06 | - | - | - |
| Manganese | 1,500,000 | 7.40 | 20.0% | 3.90 | 12.32 | 8.42 | 0.0006% | 0.0013% | Negligible |
| Nickel | 700 | 1.62 | 73.3% | 14.29 | 45.17 | 30.88 | 4.4% | 6.7% | Negligible |
| Vanadium* | 1,000 | 2.40 | 2.0% | 0.21 | 1.23 | 1.03 | 0.10% | 0.36% | Negligible |

Notes:

All impacts maximum 1-hour concentration with the exception of those marked with an * which are the maximum daily mean concentration.

6.0 CHP FACILITY ONLY

- 6.1.1 The following tables provide the maximum contribution from the CHP Facility outside the installation boundary using each year of meteorological data. The impacts have been compared to the relevant AQALs. As shown, if only the CHP Facility is operating and venting via its own stack, the impact of emissions is less than 10% of the short term AQALs and less than 0.5% of the long term AQALs with the exception of annual mean cadmium impacts. The peak annual mean cadmium impact is predicted to be 1.55% of the AQAL, but the total PEC is only predicted to be 5% of the AQAL. Therefore, applying the methodology set out in **ES Chapter 6.0 (Air Quality and Odour)**, the magnitude of impact is described as 'negligible'.

Table 6.4 – Results – CHP Only – Maximum Outside Site Boundary – Summary

| Substance | Averaging Period | Units | AQAL | Bg. | 2020 | 2021 | 2022 | 2023 | 2024 | Max | Max PC as % of AQAL | PEC | PEC as % of AQAL |
|-------------------|-----------------------------|-------------------|--------|-------|-------|-------|-------|-------|-------|-------|---------------------|--------|------------------|
| Nitrogen dioxide | Annual mean | µg/m ³ | 40 | 8.1 | 0.26 | 0.25 | 0.23 | 0.24 | 0.22 | 0.26 | 0.66% | 8.36 | 20.91% |
| | 99.79%ile of 1-hour means | µg/m ³ | 200 | 16.2 | 4.60 | 4.82 | 4.59 | 4.75 | 4.74 | 4.82 | 2.41% | 21.02 | 10.51% |
| TVOC | Annual mean | µg/m ³ | - | - | 0.05 | 0.05 | 0.05 | 0.05 | 0.04 | 0.05 | - | - | - |
| | Maximum daily mean | µg/m ³ | - | - | 0.96 | 1.30 | 0.81 | 0.85 | 1.23 | 1.30 | - | - | - |
| Sulphur dioxide | 99.18%ile of daily means | µg/m ³ | 125 | 3.0 | 2.42 | 2.46 | 1.94 | 2.11 | 2.75 | 2.75 | 2.20% | 5.75 | 4.60% |
| | 99.73%ile of hourly means | µg/m ³ | 350 | 3.0 | 5.49 | 5.71 | 5.50 | 5.72 | 5.68 | 5.72 | 1.64% | 8.72 | 2.49% |
| | 99.9%ile of 15-minute means | µg/m ³ | 266 | 3.0 | 6.51 | 6.65 | 6.21 | 6.66 | 6.34 | 6.66 | 2.51% | 9.66 | 3.63% |
| Carbon monoxide | Max. 8-hour rolling mean | µg/m ³ | 10,000 | 424.4 | 9.15 | 9.43 | 8.29 | 9.67 | 10.31 | 10.31 | 0.10% | 434.71 | 4.35% |
| | Maximum 1-hour mean | µg/m ³ | 30,000 | 424.4 | 12.16 | 11.55 | 11.26 | 11.22 | 11.16 | 12.16 | 0.04% | 436.56 | 1.46% |
| Hydrogen chloride | Maximum 1-hour mean | µg/m ³ | 750 | 1.5 | 1.46 | 1.39 | 1.35 | 1.35 | 1.34 | 1.46 | 0.19% | 2.98 | 0.40% |
| Hydrogen fluoride | Monthly mean* | µg/m ³ | 16 | 2.4 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03% | 2.36 | 14.72% |
| | Maximum 1-hour mean | µg/m ³ | 160 | 4.7 | 0.24 | 0.23 | 0.23 | 0.23 | 0.22 | 0.24 | 0.15% | 4.94 | 3.09% |
| Ammonia | Annual mean | µg/m ³ | 180 | 2.2 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01% | 2.22 | 1.24% |
| | Maximum 1-hour mean | µg/m ³ | 2,500 | 4.4 | 1.05 | 0.99 | 0.97 | 0.97 | 0.96 | 1.05 | 0.04% | 5.45 | 0.22% |
| Mercury | Annual mean | ng/m ³ | 250 | 5.6 | 0.11 | 0.10 | 0.10 | 0.10 | 0.09 | 0.11 | 0.18% | 5.71 | 9.51% |
| | Maximum 1-hour mean | ng/m ³ | 7,500 | 5.6 | 4.87 | 4.62 | 4.50 | 4.49 | 4.47 | 4.87 | 0.81% | 10.47 | 1.74% |
| Cadmium | Annual mean | ng/m ³ | 5 | 0.2 | 0.11 | 0.10 | 0.10 | 0.10 | 0.09 | 0.11 | 2.14% | 0.26 | 5.14% |
| | Maximum daily mean | ng/m ³ | 30 | 0.3 | 1.92 | 2.60 | 1.62 | 1.71 | 2.46 | 2.60 | 8.67% | 2.90 | 9.67% |
| Total metals | Annual mean | ng/m ³ | - | - | 0.11 | 0.10 | 0.10 | 0.10 | 0.09 | 0.11 | - | - | - |
| | Maximum daily mean | ng/m ³ | - | - | 1.92 | 2.60 | 1.62 | 1.71 | 2.46 | 2.60 | - | - | - |
| | Maximum 1-hour mean | ng/m ³ | - | - | 4.87 | 4.62 | 4.50 | 4.49 | 4.47 | 4.87 | - | - | - |
| Dioxins and furan | Annual mean | fg/m ³ | - | 33.0 | 2.14 | 2.02 | 1.90 | 1.93 | 1.77 | 2.14 | - | - | - |
| PCBs | Annual mean | ng/m ³ | 200 | 0.1 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.03 | 0.01% | 0.16 | 0.08% |
| | Maximum 1-hour mean | ng/m ³ | 6,000 | 0.3 | 1.22 | 1.15 | 1.13 | 1.12 | 1.12 | 1.22 | 0.02% | 1.47 | 0.02% |

| Substance | Averaging Period | Units | AQAL | Bg. | 2020 | 2021 | 2022 | 2023 | 2024 | Max | Max PC as % of AQAL | PEC | PEC as % of AQAL |
|--|--------------------------|-------------------|------|-----|------|------|------|------|------|------|------------------------------|------|------------------------|
| Excluding dust units | | | | | | | | | | | | | |
| Total dust (as PM ₁₀) | Annual mean | µg/m ³ | 40 | 9.6 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.03 | 0.07% | 9.63 | 24.07% |
| | 90.4 %ile of daily means | µg/m ³ | 50 | 9.6 | 0.10 | 0.11 | 0.12 | 0.11 | 0.10 | 0.12 | 0.24% | 9.72 | 19.44% |
| Total dust (as PM _{2.5}) | Annual mean | µg/m ³ | 20 | 5.5 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.03 | 0.13% | 5.53 | 27.63% |
| Notes: * Annual mean concentration compared to the monthly mean AQAL. | | | | | | | | | | | | | |

