Annex D7

# Thermal Oxidizer, Landfill Gas Flare and Landfill Gas Generator Stack Emission Monitoring Results

## *Table D7.1 Thermal Oxidiser Stack Emission Monitoring Results*

| Parameters | Monitoring Results |
|---|---|
| $NO_2$ | 0.55 $gs^{-1}$ |
| CO | 0.03 $gs^{-1}$ |
| $SO_2$ | 0.45 $gs^{-1}$ |
| Benzene | <2.0 x $10^{-4}$ $gs^{-1}$ |
| Vinyl chloride | <1.1 x $10^{-4}$ $gs^{-1}$ |
| Non-Methane Organic Carbon | 0.003 $gs^{-1}$ |
| Ammonia | 0.0287 $gs^{-1}$ |
| Exhaust gas velocity | 9.0 $ms^{-1}$ |

## *Table D7.2 Thermal Oxidiser Stack Continuous Monitoring Results*

| Date | Gas Combustion Temperature (°C) | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [(a)] |
|---|---|---|---|
| 1 Nov 23 | 924 | 1196 | |
| 2 Nov 23 | 925 | 1197 | |
| 3 Nov 23 | 927 | 1201 | |
| 4 Nov 23 | 924 | 1201 | |
| 5 Nov 23 | 923 | 1199 | |
| 6 Nov 23 | 926 | 1197 | |
| 7 Nov 23 | 925 | 1196 | |
| 8 Nov 23 | 926 | 1198 | |
| 9 Nov 23 | 925 | 1196 | |
| 10 Nov 23 | 924 | 1199 | |
| 11 Nov 23 | 923 | 1203 | |
| 12 Nov 23 | 925 | 1204 | |
| 13 Nov 23 | 924 | 1201 | |
| 14 Nov 23 | 927 | 1204 | |
| 15 Nov 23 | 925 | 1203 | 9.0 |
| 16 Nov 23 | 922 | 1197 | |
| 17 Nov 23 | 925 | 1198 | |
| 18 Nov 23 | 925 | 1199 | |
| 19 Nov 23 | 925 | 1200 | |
| 20 Nov 23 | 925 | 1204 | |
| 21 Nov 23 | 924 | 1201 | |
| 22 Nov 23 | 924 | 1202 | |
| 23 Nov 23 | 923 | 1198 | |
| 24 Nov 23 | 930 | 1212 | |
| 25 Nov 23 | 926 | 1206 | |
| 26 Nov 23 | 926 | 1204 | |
| 27 Nov 23 | 926 | 1204 | |
| 28 Nov 23 | Under Maintenance | | |
| 29 Nov 23 | 925 | 1197 | |
| 30 Nov 23 | 926 | 1206 | |
| **Average** | 925 | 1201 | - |
| **Min** | 922 | 1196 | - |
| **Max** | 930 | 1212 | - |

**Notes:**

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

## *Table D7.3 Landfill Gas Flare Stack Emission Monitoring Results*

| Parameters | Monitoring Results (Flare 1 – F601) |
|---|---|
| $NO_2$ | 0.02 $gs^{-1}$ |
| CO | 0.032 $gs^{-1}$ |
| $SO_2$ | 0.05 $gs^{-1}$ |
| Benzene | $<8.9 \times 10^{-5}$ $gs^{-1}$ |
| Vinyl chloride | $<7.1 \times 10^{-5}$ $gs^{-1}$ |
| Non-Methane Organic Carbon | 0.004 $gs^{-1}$ |
| Exhaust gas velocity | 6.3 $ms^{-1}$ |

## *Table D7.4 Landfill Gas Flare Stack Continuous Monitoring Results*

| Date | Gas Combustion Temperature (°C) | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [a] | Operation Status |
|---|---|---|---|---|
| **Flare 1 – F601** | | | | |
| 1 Nov 23 | 992 | 1258 | | In Operation |
| 2 Nov 23 | 900 | 1141 | | In Operation |
| 3 Nov 23 | 952 | 1206 | | In Operation |
| 4 Nov 23 | 838 | 1100 | | In Operation |
| 5 Nov 23 | 889 | 1155 | | In Operation |
| 6 Nov 23 | 836 | 1103 | | In Operation |
| 7 Nov 23 | 860 | 1118 | | In Operation |
| 8 Nov 23 | 862 | 1121 | | In Operation |
| 9 Nov 23 | 858 | 1121 | | In Operation |
| 10 Nov 23 | 993 | 1246 | | In Operation |
| 11 Nov 23 | 869 | 1129 | | In Operation |
| 12 Nov 23 | 855 | 1115 | | In Operation |
| 13 Nov 23 | 870 | 1128 | | In Operation |
| 14 Nov 23 | 981 | 1229 | | In Operation |
| 15 Nov 23 | 863 | 1123 | 6.3 | In Operation |
| 16 Nov 23 | 973 | 1239 | | In Operation |
| 17 Nov 23 | 970 | 1209 | | In Operation |
| 18 Nov 23 | 901 | 1137 | | In Operation |
| 19 Nov 23 | 867 | 1105 | | In Operation |
| 20 Nov 23 | 885 | 1129 | | In Operation |
| 21 Nov 23 | 985 | 1229 | | In Operation |
| 22 Nov 23 | 956 | 1212 | | In Operation |
| 23 Nov 23 | 913 | 1148 | | In Operation |
| 24 Nov 23 | 911 | 1161 | | In Operation |
| 25 Nov 23 | 890 | 1144 | | In Operation |
| 26 Nov 23 | 849 | 1107 | | In Operation |
| 27 Nov 23 | 916 | 1164 | | In Operation |
| 28 Nov 23 | 941 | 1170 | | In Operation |
| 29 Nov 23 | 907 | 1148 | | In Operation |
| 30 Nov 23 | 978 | 1170 | | In Operation |
| **Average** | 909 | 1159 | - | |
| **Min** | 836 | 1100 | - | |
| **Max** | 993 | 1258 | - | |
| **Flare 2 – F602** | | | | |
| 1 Nov 23 | 882 | 1101 | | In Operation |
| 2 Nov 23 | 855 | 1045 | | In Operation |
| 3 Nov 23 | 869 | 1023 | | In Operation |
| 4 Nov 23 | 853 | 1063 | | In Operation |
| 5 Nov 23 | 890 | 1107 | | In Operation |

| Date | Gas Combustion Temperature (°C) | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [a] | Operation Status |
|---|---|---|---|---|
| 6 Nov 23 | 973 | 1106 | | In Operation |
| 7 Nov 23 | 840 | 1058 | | In Operation |
| 8 Nov 23 | 863 | 1087 | | In Operation |
| 9 Nov 23 | 876 | 1093 | | In Operation |
| 10 Nov 23 | 828 | 1090 | | In Operation |
| 11 Nov 23 | 841 | 1037 | | In Operation |
| 12 Nov 23 | 855 | 1075 | | In Operation |
| 13 Nov 23 | 860 | 1073 | | In Operation |
| 14 Nov 23 | 900 | 1120 | | In Operation |
| 15 Nov 23 | 889 | 1099 | 6.3 | In Operation |
| 16 Nov 23 | 843 | 1106 | | In Operation |
| 17 Nov 23 | 885 | 1123 | | In Operation |
| 18 Nov 23 | 862 | 1084 | | In Operation |
| 19 Nov 23 | 864 | 1093 | | In Operation |
| 20 Nov 23 | 851 | 1081 | | In Operation |
| 21 Nov 23 | 859 | 1090 | | In Operation |
| 22 Nov 23 | 860 | 1073 | | In Operation |
| 23 Nov 23 | 862 | 1095 | | In Operation |
| 24 Nov 23 | 868 | 1087 | | In Operation |
| 25 Nov 23 | - | - | | Under Maintenance |
| 26 Nov 23 | - | - | | Under Maintenance |
| 27 Nov 23 | 854 | 1110 | | In Operation |
| 28 Nov 23 | 882 | 1147 | | In Operation |
| 29 Nov 23 | 865 | 1098 | | In Operation |
| 30 Nov 23 | 865 | 1119 | | In Operation |
| **Average** | 868 | 1089 | - | |
| **Min** | 828 | 1023 | - | |
| **Max** | 973 | 1147 | - | |

**Notes:**

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

## *Table D7.5 Landfill Gas Generator Stack Emission Monitoring Results*

| Parameters | Monitoring Results |
|---|---|
| $NO_2$ | 0.095 $gs^{-1}$ |
| CO | 1.082 $gs^{-1}$ |
| $SO_2$ | <0.001 $gs^{-1}$ |
| Benzene | 1.01 x $10^{-4}$ $gs^{-1}$ |
| Vinyl chloride | <1.02 x $10^{-5}$ $gs^{-1}$ |
| Non-Methane Organic Carbons | 0.0064 $gs^{-1}$ |
| Exhaust gas velocity | 11.8 $ms^{-1}$ |
| (a) The Landfill Gas Generator was under maintenance in the reporting period. | |

## *Table D7.6 Landfill Gas Generator Stack Continuous Monitoring Results*

| Date | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [(a)] | Operation Status |
|---|---|---|---|
| **ENGA** | | | |
| 1 Nov 23 | 883 | | In Operation |
| 2 Nov 23 | 884 | | In Operation |
| 3 Nov 23 | 885 | | In Operation |
| 4 Nov 23 | - | | Under Maintenance |
| 5 Nov 23 | 873 | | In Operation |
| 6 Nov 23 | 868 | | In Operation |
| 7 Nov 23 | 874 | | In Operation |
| 8 Nov 23 | 875 | | In Operation |
| 9 Nov 23 | 876 | | In Operation |
| 10 Nov 23 | 878 | | In Operation |
| 11 Nov 23 | 877 | | In Operation |
| 12 Nov 23 | 871 | | In Operation |
| 13 Nov 23 | 872 | | In Operation |
| 14 Nov 23 | 873 | | In Operation |
| 15 Nov 23 | 876 | 11.8 | In Operation |
| 16 Nov 23 | 872 | | In Operation |
| 17 Nov 23 | 872 | | In Operation |
| 18 Nov 23 | 875 | | In Operation |
| 19 Nov 23 | 877 | | In Operation |
| 20 Nov 23 | 876 | | In Operation |
| 21 Nov 23 | 878 | | In Operation |
| 22 Nov 23 | 879 | | In Operation |
| 23 Nov 23 | 875 | | In Operation |
| 24 Nov 23 | 874 | | In Operation |
| 25 Nov 23 | 875 | | In Operation |
| 26 Nov 23 | 876 | | In Operation |
| 27 Nov 23 | 858 | | In Operation |
| 28 Nov 23 | - | | Under Maintenance |
| 29 Nov 23 | - | | Under Maintenance |
| 30 Nov 23 | - | | Under Maintenance |
| **Average** | 875 | - | |
| **Min** | 858 | - | |
| **Max** | 885 | - | |
| **ENGB** | | | |
| 1 Nov 23 | - | | Under Maintenance |
| 2 Nov 23 | - | | Under Maintenance |
| 3 Nov 23 | - | | Under Maintenance |
| 4 Nov 23 | - | | Under Maintenance |

| Date | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [(a)] | Operation Status |
|---|---|---|---|
| 5 Nov 23 | - | | Under Maintenance |
| 6 Nov 23 | - | | Under Maintenance |
| 7 Nov 23 | - | | Under Maintenance |
| 8 Nov 23 | - | | Under Maintenance |
| 9 Nov 23 | - | | Under Maintenance |
| 10 Nov 23 | - | | Under Maintenance |
| 11 Nov 23 | - | | Under Maintenance |
| 12 Nov 23 | - | | Under Maintenance |
| 13 Nov 23 | - | | Under Maintenance |
| 14 Nov 23 | - | | Under Maintenance |
| 15 Nov 23 | - | | Under Maintenance |
| 16 Nov 23 | - | 11.8 | Under Maintenance |
| 17 Nov 23 | - | | Under Maintenance |
| 18 Nov 23 | - | | Under Maintenance |
| 19 Nov 23 | - | | Under Maintenance |
| 20 Nov 23 | - | | Under Maintenance |
| 21 Nov 23 | - | | Under Maintenance |
| 22 Nov 23 | - | | Under Maintenance |
| 23 Nov 23 | - | | Under Maintenance |
| 24 Nov 23 | - | | Under Maintenance |
| 25 Nov 23 | - | | Under Maintenance |
| 26 Nov 23 | - | | Under Maintenance |
| 27 Nov 23 | - | | Under Maintenance |
| 28 Nov 23 | - | | Under Maintenance |
| 29 Nov 23 | 868 | | In Operation |
| 30 Nov 23 | 868 | | In Operation |
| **Average** | 868 | - | |
| **Min** | 868 | - | |
| **Max** | 868 | - | |

**Notes:**

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.