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 |
|---|---|
| $NO_2$ | 0.89 $gs^{-1}$ |
| CO | <0.01 $gs^{-1}$ |
| $SO_2$ | <0.01 $gs^{-1}$ |
| Benzene | <2.1 x $10^{-4}$ $gs^{-1}$ |
| Vinyl chloride | <2 x $10^{-5}$ $gs^{-1}$ |
| Exhaust gas velocity | 9.7 $ms^{-1}$ |

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

| Date | Gas Combustion Temperature (°C) | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [(a)] |
|---|---|---|---|
| 1 Jul 22 | 928 | 1168 | |
| 2 Jul 22 | 924 | 1167 | |
| 3 Jul 22 | 923 | 1165 | |
| 4 Jul 22 | 924 | 1171 | |
| 5 Jul 22 | 923 | 1172 | |
| 6 Jul 22 | 928 | 1171 | |
| 7 Jul 22 | 923 | 1170 | |
| 8 Jul 22 | 929 | 1171 | |
| 9 Jul 22 | 920 | 1169 | |
| 10 Jul 22 | 924 | 1172 | |
| 11 Jul 22 | 930 | 1172 | |
| 12 Jul 22 | Under Maintenance | | |
| 13 Jul 22 | Under Maintenance | | |
| 14 Jul 22 | 934 | 1169 | |
| 15 Jul 22 | 926 | 1170 | |
| 16 Jul 22 | 920 | 1168 | 9.7 |
| 17 Jul 22 | 928 | 1171 | |
| 18 Jul 22 | 929 | 1162 | |
| 19 Jul 22 | 918 | 1167 | |
| 20 Jul 22 | 932 | 1175 | |
| 21 Jul 22 | 924 | 1172 | |
| 22 Jul 22 | 918 | 1169 | |
| 23 Jul 22 | 924 | 1173 | |
| 24 Jul 22 | 927 | 1173 | |
| 25 Jul 22 | 925 | 1170 | |
| 26 Jul 22 | 924 | 1168 | |
| 27 Jul 22 | 925 | 1170 | |
| 28 Jul 22 | 930 | 1172 | |
| 29 Jul 22 | 922 | 1168 | |
| 30 Jul 22 | 924 | 1168 | |
| 31 Jul 22 | 927 | 1167 | |
| **Average** | 925 | 1169 | - |
| **Min** | 918 | 1162 | - |
| **Max** | 934 | 1175 | - |

**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 2 – F602) |
|---|---|
| $NO_2$ | <0.01 $gs^{-1}$ |
| CO | 0.53 $gs^{-1}$ |
| $SO_2$ | 0.01 $gs^{-1}$ |
| Benzene | <1.8 x $10^{-5}$ $gs^{-1}$ |
| Vinyl chloride | <1.4 x $10^{-5}$ $gs^{-1}$ |
| Exhaust gas velocity | 6.5 $ms^{-1}$ |

## *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 Jul 22 | 923 | 1029 | | In Operation |
| 2 Jul 22 | 911 | 999 | | In Operation |
| 3 Jul 22 | 891 | 1068 | | In Operation |
| 4 Jul 22 | 899 | 1073 | | In Operation |
| 5 Jul 22 | 902 | 1072 | | In Operation |
| 6 Jul 22 | 822 | 1070 | | In Operation |
| 7 Jul 22 | 947 | 1045 | | In Operation |
| 8 Jul 22 | 894 | 990 | | In Operation |
| 9 Jul 22 | 915 | 1037 | | In Operation |
| 10 Jul 22 | 901 | 1057 | | In Operation |
| 11 Jul 22 | 895 | 1025 | | In Operation |
| 12 Jul 22 | 940 | 1063 | | In Operation |
| 13 Jul 22 | 836 | 1060 | | In Operation |
| 14 Jul 22 | 950 | 1033 | | In Operation |
| 15 Jul 22 | 880 | 973 | | In Operation |
| 16 Jul 22 | 900 | 1013 | 6.5 | In Operation |
| 17 Jul 22 | 885 | 1028 | | In Operation |
| 18 Jul 22 | 920 | 1033 | | In Operation |
| 19 Jul 22 | 950 | 1083 | | In Operation |
| 20 Jul 22 | 920 | 1073 | | In Operation |
| 21 Jul 22 | 890 | 1033 | | In Operation |
| 22 Jul 22 | 880 | 1053 | | In Operation |
| 23 Jul 22 | 920 | 1053 | | In Operation |
| 24 Jul 22 | 900 | 1053 | | In Operation |
| 25 Jul 22 | 890 | 1003 | | In Operation |
| 26 Jul 22 | 955 | 998 | | In Operation |
| 27 Jul 22 | 860 | 1033 | | In Operation |
| 28 Jul 22 | 880 | 1013 | | In Operation |
| 29 Jul 22 | 900 | 963 | | In Operation |
| 30 Jul 22 | 860 | 993 | | In Operation |
| 31 Jul 22 | 920 | 1063 | | In Operation |
| **Average** | 901 | 1035 | - | |
| **Min** | 822 | 963 | - | |
| **Max** | 955 | 1083 | - | |
| **Flare 2 – F602** | | | | |
| 1 Jul 22 | 830 | 1073 | | In Operation |
| 2 Jul 22 | 860 | 1073 | | In Operation |
| 3 Jul 22 | 890 | 1113 | | In Operation |
| 4 Jul 22 | 930 | 1153 | 6.5 | In Operation |
| 5 Jul 22 | 860 | 1103 | | In Operation |
| 6 Jul 22 | 884 | 1109 | | In Operation |
| 7 Jul 22 | 834 | 1068 | | In Operation |

| Date | Gas Combustion Temperature (°C) | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) (a) | Operation Status |
|---|---|---|---|---|
| 8 Jul 22 | 830 | 1083 | | In Operation |
| 9 Jul 22 | 870 | 1093 | | In Operation |
| 10 Jul 22 | 830 | 1063 | | In Operation |
| 11 Jul 22 | 905 | 1163 | | In Operation |
| 12 Jul 22 | 840 | 1093 | | In Operation |
| 13 Jul 22 | 870 | 1113 | | In Operation |
| 14 Jul 22 | 840 | 1083 | | In Operation |
| 15 Jul 22 | 824 | 1067 | | In Operation |
| 16 Jul 22 | 834 | 1093 | | In Operation |
| 17 Jul 22 | 904 | 1143 | | In Operation |
| 18 Jul 22 | 865 | 1096 | | In Operation |
| 19 Jul 22 | 845 | 1083 | | In Operation |
| 20 Jul 22 | 880 | 1118 | | In Operation |
| 21 Jul 22 | 854 | 1089 | | In Operation |
| 22 Jul 22 | 830 | 1078 | | In Operation |
| 23 Jul 22 | 880 | 1083 | | In Operation |
| 24 Jul 22 | 830 | 1063 | | In Operation |
| 25 Jul 22 | 842 | 1077 | | In Operation |
| 26 Jul 22 | 844 | 1097 | | In Operation |
| 27 Jul 22 | 854 | 1061 | | In Operation |
| 28 Jul 22 | 875 | 1063 | | In Operation |
| 29 Jul 22 | 835 | 1091 | | In Operation |
| 30 Jul 22 | 874 | 1101 | | In Operation |
| 31 Jul 22 | 860 | 1093 | | In Operation |
| **Average** | 858 | 1093 | - | |
| **Min** | 824 | 1061 | - | |
| **Max** | 930 | 1163 | - | |

**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 |
|---|---|
| $NO_2$ | 0.01 $gs^{-1}$ |
| CO | 0.28 $gs^{-1}$ |
| $SO_2$ | 0.003 $gs^{-1}$ |
| Benzene | <8.0 x $10^{-6}$ $gs^{-1}$ |
| Vinyl chloride | <1.8 x $10^{-6}$ $gs^{-1}$ |
| Exhaust gas velocity | 11.2 $ms^{-1}$ |

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

| Date | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) (a) | Operation Status (Landfill Gas Generator in Operation) |
|---|---|---|---|
| 1 Jul 22 | 867 | | In Operation (ENGA) |
| 2 Jul 22 | 865 | | In Operation (ENGA) |
| 3 Jul 22 | 869 | | In Operation (ENGA) |
| 4 Jul 22 | 848 | | In Operation (ENGA) |
| 5 Jul 22 | 852 | | In Operation (ENGA) |
| 6 Jul 22 | 851 | | In Operation (ENGA) |
| 7 Jul 22 | 884 | | In Operation (ENGA) |
| 8 Jul 22 | 886 | | In Operation (ENGA) |
| 9 Jul 22 | 887 | | In Operation (ENGA) |
| 10 Jul 22 | 888 | | In Operation (ENGA) |
| 11 Jul 22 | 889 | | In Operation (ENGA) |
| 12 Jul 22 | 880 | | In Operation (ENGA) |
| 13 Jul 22 | 880 | | In Operation (ENGA) |
| 14 Jul 22 | 893 | | In Operation (ENGA) |
| 15 Jul 22 | 871 | | In Operation (ENGB) |
| 16 Jul 22 | 885 | 11.2 | In Operation (ENGA) |
| 17 Jul 22 | 886 | | In Operation (ENGA) |
| 18 Jul 22 | 859 | | In Operation (ENGA) |
| 19 Jul 22 | 866 | | In Operation (ENGA) |
| 20 Jul 22 | 857 | | In Operation (ENGA) |
| 21 Jul 22 | 857 | | In Operation (ENGA) |
| 22 Jul 22 | 859 | | In Operation (ENGA) |
| 23 Jul 22 | 860 | | In Operation (ENGA) |
| 24 Jul 22 | 861 | | In Operation (ENGA) |
| 25 Jul 22 | 863 | | In Operation (ENGA) |
| 26 Jul 22 | 866 | | In Operation (ENGA) |
| 27 Jul 22 | 859 | | In Operation (ENGA) |
| 28 Jul 22 | 861 | | In Operation (ENGA) |
| 29 Jul 22 | 859 | | In Operation (ENGA) |
| 30 Jul 22 | 857 | | In Operation (ENGA) |
| 31 Jul 22 | 860 | | In Operation (ENGA) |
| **Average** | 869 | - | |
| **Min** | 848 | - | |
| **Max** | 893 | - | |

**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.