Government of JERSEY

Summary report for Turnkey Osiris Particle results at Halkett Place and Howard Davis Park Sites in Jersey for 2014-2020

Natural Environment

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Executive Summary

This summary report presents the results for 2014 - 2020, part of an ongoing programme of particle monitoring in Jersey which started in 2002, carried out by Natural Environment which is part of the Department for Infrastructure and the Environment (I&E) within the Government of Jersey. It compares the particle data for Jersey with the relevant World Health Organisation (WHO) guidelines, European Union (EU) and UK air quality limit values, and as well as data from the previous years' monitoring programmes. Jersey's Air Quality Strategy 2013 limits are based on those in the EU Directive limits and UK Air Quality Standards Regulations 2010 but are not legally enforceable.

Clean air is fundamental to our health and air pollution is the largest environmental risk to public health. There is overwhelming evidence that air pollution can affect multiple organ systems in the human body, even at very low exposure concentrations. Indeed, major advances in air pollution research have shown that there is no threshold below which exposure can be regarded as safe. Furthermore, children's lungs are more sensitive and likely to be easily damaged. The main air quality issue in Jersey relates to the impact of traffic on local air quality.

Air quality in Jersey is generally good as it's a windblown island with prevailing westerly winds including north westerlies and south westerlies however elevated levels of localised air pollution do occur for example during periods of traffic congestion particularly in canyon type streets and in the tunnel. Jersey has one of the highest car ownership levels with over 120,000 vehicles registered to a population of approximately 103,000. There is no MOT for cars at present so older more polluting vehicles are still being driven.

Particle monitoring is undertaken to assess air quality in St Helier over time to determine trends. The 2012 States Strategic plan says "It is vital to protect and evaluate Jersey's ecosystem services - clean air and water, good waste management and a healthy working countryside and marine environment - through investment in modern technology, a proportionate regulator regime in line with best practice and global commitments to ensure a healthy local population and environmental quality"[1].

Particle monitoring is undertaken using Turnkey Osiris particle monitors at a roadside site at the Central Market on Halkett Place and at a background site in Howard Davis Park, St Helier. Levels of particles increase during the morning on Halkett Place often due to congestion and delivery vehicles leaving their engines running. Certain vehicles such as refuse and delivery vehicles must run engines to allow bins to be raised and maintaining cold temperatures for food deliveries. Signs are provided on the market railings requesting driver switch engines off. The site at Howard Davis Park is a background site and is less affected by traffic emissions. Windblown sand, salt and biological material such as spores are the dominant sources. The Osiris particle monitors are indicative only as they are not EU type approved and cannot be co located / calibrated against an automatic more accurate particle analyser as none are available on island, so care is needed interpreting the data.

The 2020 COVID-19 pandemic resulted in calibration delays in the UK due to staff shortages which affected data capture rates. Particle levels reduced in the first lock down (March 2020) by up to 30% PM_{10} and up to 13% $PM_{2.5}$ respectively at the central market / Halkett Place site however the reduction was greater in the second lock down (October /November) by up to 67% PM_{10} and up to 72% $PM_{2.5}$.

Particle levels are compared to the limits set out in European Union (EU) and UK legislation and the World Health Organisation (WHO) guidelines. Jersey's Air Quality Strategy 2013 limits are based on those in the UK Air Quality Standards Regulations 2010.

The PM_{10} exceedances of the 24 hour average of 50 $\mu g/m^3$ for the period 2014 – 2020 did not exceed the EU and UK limits at both sites as 35 exceedances per year are allowed. The EU annual health limits of 40 $\mu g/m^3$ for PM_{10} and 20 $\mu g/m^3$ for $PM_{2.5}$ (to be achieved by 2015) were also not exceeded at either site.

The annual mean levels for the Halkett Place /market site did not exceed the WHO Air Quality Guideline for PM_{10} of 20 $\mu g/m^3$.

The annual mean levels for the Halkett Place /market site exceeded the WHO Air Quality Guideline for $PM_{2.5}$ of 10 $\mu g/m^3$ in years 2017,18,19 and 2020.

The annual mean levels for the Howard Davis Park site did not exceed the WHO Air Quality Guidelines for PM_{10} of 20 $\mu g/m^3$ and $PM_{2.5}$ of 10 $\mu g/m^3$ respectively.

The 24 hour mean levels for the Halkett Place /market site exceeded the PM_{10} WHO Air Quality Guideline of 50 $\mu g/m^3$ (which allows 3 exceedances per year) in all years from 2014 – 2020.

The 24 hour mean levels for the Halkett Place /market site exceeded the $PM_{2.5}$ WHO Air Quality Guideline of 25 $\mu g/m^3$ (which allows 3 exceedances per year) in the years 2014, 2017, 2018, and 2019.

The 24 hour mean levels for the Howard Davis Park site exceeded the PM_{10} WHO Air Quality Guideline of 50 $\mu g/m^3$ (which allows 3 exceedances per year) in the years 2014 and 2015.

The 24 hour mean levels for the Howard Davis Park site exceeded the $PM_{2.5}$ WHO Air Quality Guideline of 25 $\mu g/m^3$ (which allows 3 exceedances per year) in the years 2014, 2015, and 2019.

At both sites the number of exceedances has reduced over the period 2014 to 2020 indicating an improvement in air quality however care is needed interpreting these results.

PM_{10} and $PM_{2.5}$ concentrations in Jersey are broadly similar to those found in comparable urban areas in the UK. Levels at the Market/Halkett Pace site are what would be expected at a roadside location in the UK and the Howard Davis Park site levels are typical of an urban background location.

Exceedances tend to occur in the spring, autumn and winter months. The weather at these times is characterised by longer nights, clear skies, low wind speeds, relatively dry air, and conditions which can result in temperature inversions (i.e., an increase in temperature with height), which results in the trapping of moisture and pollutants in the surface air layer.

It is recommended that an EU type approved automatic particle analyser is provided to provide more detailed particle data and allow co location of the Osiris units to determine their accuracy and any bias adjustment figure as Osiris units tend to read low due to the heated inlet removing volatile particles. It is also recommended that further long-term research be carried out to assess levels of $PM_{10}/PM_{2.5}$ in Jersey associated with traffic numbers, its mix, and speed and meteorological conditions to establish trends and assess compliance with EU, UK and WHO levels.

Improvements in air quality are generally made through discussion, advice, and persuasion as there is no specific air quality legislation in Jersey. It is hoped that measures to reduce the effects of climate change will also improve local air quality.

For a copy of the full report please email environment@gov.je or call 01534 441600