

1 Health and Wellbeing

1.1 Summary

- 1.1.1 It is widely perceived that the EfW CHP facility could potentially impact on the health and well-being of local communities, which are directly associated with air quality, noise and traffic.
- 1.2.1 The current body of evidence as reported by the Health Protection Agency in 2010 and by the Department of Environment, Food and Rural Affairs in 2004 demonstrates very clearly that the operation of a modern, well managed EfW facility within any urban centre in the UK is likely to cause a very small, if detectable, effect on the health of those living in the surrounding area.
- 1.3.1 The health and well-being assessment conducted by Scott Wilson for the proposed EfW CHP facility shows that emissions to air would not result in a significant impact at residential properties, schools, hospitals or other locations. The assessment of the effect of the emissions on human health, using the Department of Health Committee on the Medical Effects of Air Pollution (COMEAP) assessment methods, has demonstrated that predicted impacts do not represent a significant health risk to the local population.
- 1.4.1 The construction and operation of the EfW CHP facility also are perceived to have the potential to impact on the social determinants of mental well-being. Various aspects of the proposed development itself and of MVV's ethos seek to have a reassuring impact on well-being. These measures include those to reduce the impact of emissions to air, noise and traffic as far as possible, and the establishment of a Local Liaison Committee.

2.1 Health and Well-being Statement

- 2.1.1 In 2004 the Department for Environment, Food and Rural Affairs (Defra) commissioned a comprehensive review of the information available on the physical environmental and health effects of options, including incineration, for the management of municipal solid wastes and other similar wastes. The report was updated (Defra, 2011) to include an analysis of costs and benefits in monetary terms, but the conclusions with respect to physical effects remain almost unchanged. In his foreword to the 2004 review report (Defra, 2004) the Minister of State, Environment and Agri-environment noted:

“... the report's conclusion that, on the evidence from studies so far, the treatment of municipal solid waste has at most a minor effect on health in this country particularly when compared with other risks associated with ordinary day to day living”

- 2.2.1 This theme was also picked up by Defra's Chief Scientific Advisor in his foreword to the same review report (Defra, 2004), in which he states that:

“The review has concluded that the effects on health from emissions from incineration, largely to air, are likely to be small in relation to other known risks to health. I have confidence in this conclusion, particularly bearing in mind the fact

that the current generation of municipal solid waste incinerators have to comply with much more stringent emission standards than those which formed the basis for the majority of studies of health effects in the literature. This does not mean that we can afford to be complacent; rigorous enforcement will be crucial to ensure that the new emission standards are not exceeded, and that non-standard operating conditions, as noted by the Royal Society, do not lead to levels of emission which would give rise to concern”.

- 2.3.1 In 2010 the Health Protection Agency (HPA) published advice on the impacts on health of emissions to air from municipal waste incinerators (HPA, 2010) and confirmed that the evidence base for the Defra report had not changed significantly since 2004. With respect to planning applications to build EfW facilities or environmental permit applications to operate EfW facilities, *“the HPA’s view is that the study undertaken for Defra by Enviros can be relied on although, like all scientific findings, it may be subject to revision if new data were to emerge”.*
- 2.4.1 Findings of the reviews reported by Defra (Defra, 2004 and 2011) and the HPA (HPA, 2010) of particular relevance to this assessment are that:
- Evidence in the scientific literature relating to the effect of waste incinerators on populations living around them have been based on older plant, operated to emission limits that were higher during the study period than is currently permitted, and these studies reported a low risk to health.
 - The conclusions of studies based at older incinerators in earlier decades can not be directly extrapolated, with any reliability, to calculate the effect of modern plant operating to more stringent emission limits. However, the relative magnitude of impacts from modern EfW facilities on ambient air pollutant concentrations are demonstrably lower.
 - The contributions to air pollutant concentrations made by modern well managed EfW facilities are so small that, if effects on health exist, they are likely to be very small and not detectable.
 - Methods have been developed for the assessment of effects of air pollutants emitted by industrial processes on the health of local populations and so long as the data and associated uncertainties are considered appropriately, then these methods provide useful information. Too much weight should not be put on small differences between already small numbers.
 - Ambient concentrations of air pollutants, including the contribution of emissions from an EfW facility, can be compared against national air quality standards if a standard has been set (H.M. Government, 2000, 2002.) If the standard is not exceeded, it can reasonably be assumed that the additional risk to health imposed by the emissions from the EfW facility would be minimal.
- 2.5.1 The impact of deprivation or life style factors such as smoking, diet or low levels of exercise on life expectancy and people’s functional capacity are greater than the impact of exposure to ambient air pollutants at the range of concentrations currently experienced in the UK’s towns and cities. When considering health effects in areas surrounding single point sources of air pollution, such as EfW facilities, deprivation and life style factors will exert a strong influence on the health outcomes under consideration. It may not be possible to fully control for the uncertainty introduced by these factors within a project specific impact assessment, due to the relatively

small populations, short timescales and small impacts involved (HPA, 2010). To control for uncertainty in the estimates of specific impacts, the adoption of a conservative approach is a common feature of the numerical methods used and as a consequence the reported impacts tend to represent over-estimates of impacts.

2.6.1 The current body of evidence as reported by the Health Protection Agency (HPA, 2010) and by Defra (Defra, 2004) demonstrates very clearly that the operation of a modern, well managed EfW facility within any urban centre in the UK is likely to cause a very small, if detectable, effect on the health of those living in the surrounding area.

2.7.1 The Foresight Review on Mental Capital and Well-being (Foresight, 2009) defined well-being as:

“... a dynamic state, in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community”.

2.8.1 This assessment adopts the above definition of well-being and focuses on those impacts of the proposed development that are directly associated with air quality, acoustics (noise and vibration) or with road vehicle movements, and the potential for the impacts to affect social determinants of well-being.

2.9.1 The spatial scope of the assessment of effects on health and well-being extends to include all communities located close to the proposed facility or significantly affected links on the road network. Consideration of impacts associated with changes in air pollutant concentrations has been given to all communities within 10 km of the proposed chimney location.

2.10.1 The temporal scope of the assessment of effects on health and well-being reflects the nature of the impacts considered, with the proposed year of opening representing the main assessment scenario. For air quality related impacts annual risks and life time risks have been quantified as appropriate.

2.11.1 Emissions to air from the facility and additional road traffic exhaust emissions during both the construction and operational phase have been assessed using a detailed quantitative method. The predicted pollutant concentrations associated with the operation of the EfW CHP facility would not result in a significant effect at any air quality sensitive receptors.

2.12.1 Emissions to air from the facility would not result in a significant impact at air quality sensitive receptors within 10 km of the proposed EfW CHP facility. The assessment of the effect of predicted change in the ambient concentrations of sulphur dioxide (SO₂), nitrogen dioxide (NO₂) and respirable particulate matter (PM₁₀ and PM_{2.5}) on human health has demonstrated that the predicted impacts do not represent a significant effect to the health of the local population as a whole.

2.13.1 In addition the carcinogenic and non-carcinogenic risk to human health from exposure of the local community to emissions of metals (including arsenic, mercury, chromium and cadmium) and organic substances (including dioxins/furans and polycyclic aromatic hydrocarbons) have been quantified using internationally accepted methods. The additional risks to human health associated with the predicted magnitude of additional exposure to these emissions, resulting from the

operation of the ERF CHP facility, have been demonstrated to be so small that they would not represent a significant effect.

- 2.14.1 The effects on human health predicted for the proposed EfW CHP facility, as a result of emissions of pollutants to air, are in keeping with the low level of risk to health that Defra and the Health Protection Agency have identified as being achievable by modern well managed EfW facilities in the UK.
- 2.15.1 The construction and operation of the proposed EfW CHP facility has the potential to impact on the social determinants of mental well-being. The mitigation measures incorporated into the design and operational stages of the proposed EfW CHP facility, including those to reduce the impact of emissions to air, noise and vibration, road traffic and the perceived impact of the facility, seek to have a positive impact on well-being. Other developments within the local area e.g. the delivery of a new district centre at Weston Mill, the Plymouth Life Centre and the housing regeneration project in North Prospect will seek to separately improve the health and well-being of the local population. The cumulative effect of these developments and the incorporated mitigation measures within the design of the proposed EfW CHP facility has the potential to improve the overall health and well-being of the local population.
- 2.16.1 The incorporated mitigation measures within the design of the proposed EfW CHP facility taken together with other developments in the local area can be reasonably considered to be capable of minimising the potential for adverse effects on the core protective factors for mental well-being.
- 2.17.1 Overall the proposed scheme is highly unlikely to interfere with the successful implementation of any of the measures in Plymouth's Health, Social Care and Well-being Strategy that are intended to address priority health and well-being inequalities within Plymouth. Therefore the effect of the scheme (with incorporated mitigation) on health and well-being is considered to be negligible and any fears of potential health and well-being effects are unlikely to be objectively justified.

3.1 References

Defra, 2004, Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes, written by Enviro Consulting Ltd and University of Birmingham with Risk and Policy Analysis Ltd, Open University and Maggie Thurgood, Defra Publications.

Defra, 2011, Update to Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes, written by Enviro Consulting Ltd in conjunction with Economics for the Environment Consultancy (EFTEC), Defra Publications.

Foresight, 2009, Foresight Mental Capital and Wellbeing Project (2008), Final Project report, London: The Government Office for Science.

Health Protection Agency, 2010, The Impact on Health of Emissions to Air from Municipal Waste Incinerators, Health Protection Agency.

H.M. Government, 2000, Air Quality (England) Regulations 2000, Statutory Instrument No 928, The Stationery Office.

H.M. Government, 2002, The Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument No 3043, The Stationery Office.