

The Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and
Procedure) Regulations 2009
Regulation 5(2)(q)

**The Proposed Rookery South (Resource Recovery Facility)
Order**

Health Impact Assessment

4 August 2010

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Glossary

Generic Terminology

Combined Heat and Power/CHP	The simultaneous generation of usable heat and power in a single process.
Conservation Area	A Conservation Area is an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance
Energy from Waste Facility	That physical part of the RRF which is used for power and heat generation, including the tipping hall, bunker, condensers, etc.
Energy from Waste Plant	That part of the EfW which refers to the 'technical' parts of the EfW Facility i.e. coolers, condensers, boilers etc.
Historic Environment Record	Is a record of all known archaeology
Listed Building	Is a building that has been placed on the Statutory List of Buildings of Special Architectural or Historic Interest.
Low Level Restoration Scheme	The proposal by O&H Properties for the restoration of the Rookery South Pit to low-level agricultural use.
Materials Recovery Facility	A post-treatment facility to recover bottom ash and metals.
Municipal Waste	A waste type that includes predominantly household waste (domestic waste) with sometimes the addition of commercial wastes collected by a municipality within a given area. They are in either solid or semisolid form and generally exclude industrial hazardous wastes .
Nationally Significant Infrastructure Project	Large scale projects that support the economy and vital public services, including railways, wind farms, power stations, reservoirs, harbours, airports and sewage treatment works.
Operations Area	That area of Rookery South that includes the RRF (EfW Facility and the MRF).
ROMP Application	The review of old minerals permissions submitted in January 2000; reference number BC/CM/2000/08.
Registered Parks and Gardens	Designated parks and gardens that make a contribution to the richness of the English landscape and cross references listed buildings associated with them.
Scheduled National Monument	Refers to an archaeological site that is recognised as being of national importance and is by definition legally protected and conserved.
Sites of Special Scientific Interest	A conservation designation denoting a protected area in the United Kingdom.
Study Area for the Site Assessment	Includes Central Bedfordshire, Bedford Borough, Luton, Buckinghamshire, Cambridgeshire, Hertfordshire, Northamptonshire, Milton Keynes and The Royal Borough of Windsor and Maidenhead.

HIA Terminology

Ambient Noise	Total encompassing sound in a given situation at a given time, usually composed of sound from many sources far and near.
Background Noise	In BS 4142 this is defined as the A weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval, T (LA90,T).
Dioxins	Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans are a group of chemically-related compounds that are persistent environmental pollutants which are toxic and can therefore affect human health in sufficient concentrations.
Dust	Total airborne particulate matter in all size fractions
Decibel (dB)	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure levels the reference quantity is 20µPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions. [PPG 24]
dB(A), LA	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3dB(A) is the minimum perceptible under normal conditions, and a change of 10dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30dB(A); normal conversation about 60dB(A) at 1m; heavy road traffic about 80 dB(A) at 10m; the level near a pneumatic drill about 100dB(A).
Epidemiology	Medical/ scientific research that studies the factors determining the causes, frequency, and distribution of diseases in a community or population.
Health	"A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" as defined by the WHO.
Health Determinant	Any factor which has the potential to influence the health of an individual or population.
Health Impact Assessment	A combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population
Health Pathway	Any activity that influences a known determinant of health.
Health Protection Agency	UK agency providing an integrated approach to protecting public health through the provision of support and advice to the NHS, local authorities, emergency services, other arms length bodies, the Department of Health and the devolved administrations.

Index of Multiple Deprivation	A combination of a number of indicators, covering a range of economic, social and housing issues, to produce a deprivation score for each small area in England.
Landscape	Primarily the visual appearance of the land, including its shape, form and colours. However, landscape is not purely a visual phenomenon. The landscape relies on a range of other dimensions including geology, landform, soils, ecology, archaeology, landscape history, land use, architecture and cultural associations.
NICE	National Institute for Health and Clinical Excellence (NICE) is an independent organisation responsible for providing national guidance on promoting good health and preventing and treating ill health.
NHS Bedfordshire	The publically funded health care provider responsible for the health and provision of health care for all people living in Bedfordshire.
Particulate matter	Solid particles and liquid droplets found in the air of various sizes.
Preliminary Environmental Report	Report providing preliminary environmental information for the proposed Project in accordance with Regulations 2 and 10 or the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 to enable consultation on the proposals.
Public Health	All organised measures (whether public or private) to prevent disease, promote health, and prolong life among the population as a whole. Its activities aim to provide conditions in which people can be healthy and focus on entire populations, not on individual patients or diseases
Receptors	Group of people are most likely to be impacted by the health outcome that has been identified. Receptors can be people that live or work close to the site or along the proposed transport route.
Social Capital	Describes the pattern and intensity of networks among people and the shared values which arise from those networks. Greater interaction between people generates a greater sense of community spirit and is associated with health benefits.
Vulnerable groups	Those individuals who will be unduly affected by the proposed development and include children, the elderly, the disabled and people of low socio-economic status.
World Health Organisation	Directing and coordinating authority for health within the United Nations system.

Acronyms and Abbreviations

A&E	Accident and Emergency
CHP	Combined Heat and Power Facility
CLP	Community Liaison Panel
DCO	Development Consent Order
HIA	Health Impact Assessment
EA	Environment Agency
EU	European Union
EIA	Environmental Impact Assessment
EfW	Energy from Waste
ES	Environmental Statement
GP	General Practitioner
HGV	Heavy Goods Vehicle
HPA	Health Protection Agency
IMD	Indices of Multiple Deprivation
IPC	Infrastructure Planning Commission
IRAP	Industrial Risk Assessment Programme
LGV	Light Goods Vehicle
LLRS	Low Level Restoration Scheme
MRF	Materials Recovery Facility
NHS	National Health Service
NICE	National Institute for Health and Clinical Excellence
NIRAH	National Institute for Research into Aquatic Habitats
NO ₂	Nitrogen Dioxide
NSIP	Nationally Significant Infrastructure Project
PCT	Primary Care Trust
PER	Preliminary Environmental Statement
PM ₁₀	Particulate Matter less than 10 microns in diameter
PPG	Planning Policy Guidance Note
RoW	Rights of Way
RRF	Resource Recovery Facility
WHO	World Health Organization

1.0 Executive Summary

1.1 Background

1.1.1 Covanta Rookery South Limited (Covanta) is submitting a Development Consent Order (DCO) Application to the Infrastructure Planning Commission (IPC) to construct and operate a Resource Recovery Facility (RRF) at Rookery South Pit near Stewartby.

1.1.2 The RRF has two main elements:

- 1) an Energy from Waste (EfW) Facility exporting enough electricity to meet the needs of approximately 82,500 homes (broadly equivalent to the needs of Bedford and the Marston Vale); and
- 2) a Materials Recovery Facility (MRF) recovering secondary aggregate and metals from the Rookery South EfW process.

1.1.3 The Project includes areas for HGV and staff car parking to service the RRF, a new junction and upgraded road access from Green Lane, as well as an underground connection to the National Grid. 85% of vehicle deliveries will be between 7am and 5pm, with the remainder expected between the hours of 5am and 11pm.

1.1.4 Significant new tree planting is proposed, together with upgrades to local footpaths in the area, both of which will make a meaningful contribution to the Forest of Marston Vale.

1.1.5 There is no statutory requirement to carry out a Health Impact Assessment (HIA) for this Project. This HIA forms part of a suite of documents that comprise the application to the IPC. The HIA should therefore be read alongside the Environmental Statement (ES) accompanying the DCO Application for the Project. The aim in undertaking this work has been to provide all interested parties with an overview of the Project's implications for health.

1.1.6 The HIA has the following aims and objectives:

- 1) to determine the potential health impacts of the proposed RRF on nearby residents, including identifying inequality issues;
- 2) to identify ways to maximise positive and minimise negative impacts; and
- 3) to inform the decision making process and respond to health issues raised through this process.

- 1.1.7 Covanta's response to the findings of the HIA can be found in Annex D of the main HIA report.

1.2 Health Impact Assessment Approach

- 1.2.1 Health, or more importantly what constitutes good health, is difficult to define and measure in all its aspects for a population, not least because perceptions regarding health and expectations of good health vary. Following best practice, this HIA takes the World Health Organization's (WHO) definition, which states that health is

*"a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity"*¹

- 1.2.2 The basis of the HIA is therefore a broad 'socio-economic model' of health taking into account a number of factors, known as determinants of health, including:

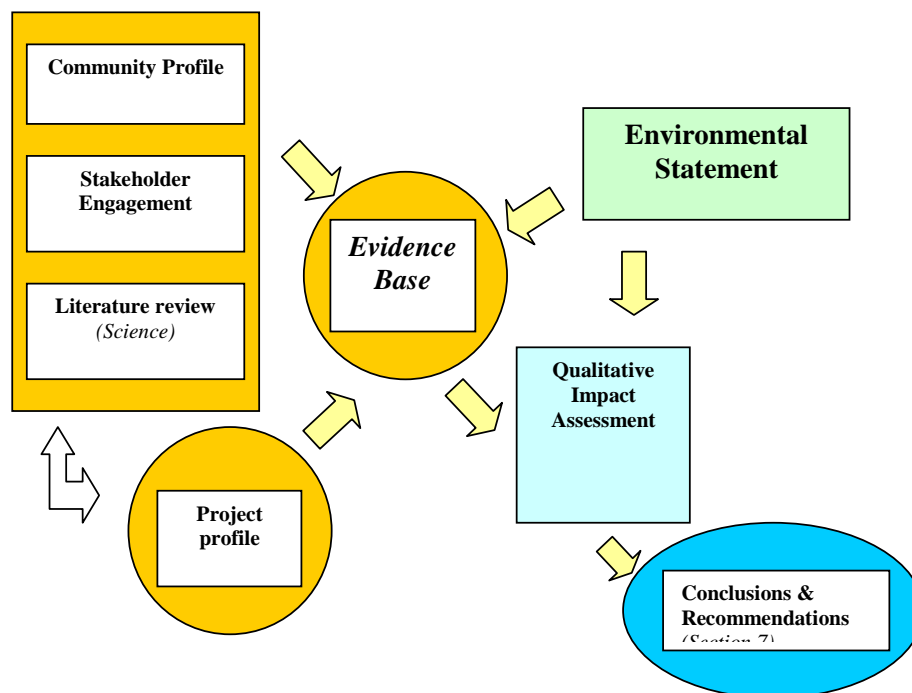
- 1) age and genetics;
- 2) individual life style factors;
- 3) living and working conditions; and
- 4) general socio-economic, cultural and environmental conditions.

- 1.2.3 When conducting the HIA, the effect of the Project on these health determinants is considered via health pathways. A health pathway can be described as any activity that influences a known determinant of health.

1.3 Methodology

- 1.3.1 The overarching methodology applied in this HIA to meet the objectives of the assessment is presented in Figure 1.1.

¹ World Health Organization, (1948), Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946

Figure 1.1 HIA Methodology

- 1.3.2 The Project Profile provides a description of the aspects of the Project that are relevant to health and is used to determine the health 'pathways' which could be impacted by the Project and potential health outcomes.
- 1.3.3 The evidence base is used to inform the assessment of the identified health pathways and is made up of the Community Profile, Literature Review and Stakeholder Engagement.
- 1.3.4 The assessment is the process of discussing the potential health impacts based on data from the ES and information from the evidence base. Potential health outcomes are discussed for the various stages of the Project.
- 1.3.5 This section aims to identify means of avoiding unnecessary damage to a community's health, healthcare services and social services etc and to promote and maximise any benefits associated with the Project.

1.4 Constraints and Limitations of the HIA

- 1.4.1 There were no major constraints in undertaking the HIA, although the following limitations should be noted;
- 1) the community profile information is only available at a ward level; smaller area statistics are not available. In addition, community profile data at ward level are primarily from Census 2001 data which are now nine years old;

- 2) recent changes in the administrative boundaries of the local authorities in Bedfordshire mean that directly comparable area data over recent years were not available for some health indicators; and
- 3) the HIA was commissioned during the latter stages of the pre-application process and has been undertaken within a timeframe defined by the submission date for the Application.

1.5 Summary of Effects

- 1.5.1 Any measurable effects on health as a result of changes to the physical environment (eg changes in air quality or the noise climate) are not expected to occur as a result of the proposed RRF. The evidence from the Environmental Statement is that any such changes would be very small in magnitude and insufficient to cause notable health effects to the local community. This conclusion is contrary to the expectations of the local community, for whom such effects represent a prominent anxiety. Some means of addressing these concerns will be required if and when the Project proceeds.
- 1.5.2 The experience of the former Stewartby brick works' operations provides a point of reference for residents against which to anticipate the future impacts on local air quality. In fact, the emissions to atmosphere of some important pollutants from the RRF will be less than was the case for the brick works and in particular the emissions of sulphur dioxide. The sulphur compounds released by the brick works were responsible for causing local odour problems and ultimately led to the closure of the brick works through the inability to comply with the relevant air quality standard. The RRF will emit a maximum of 59 tonnes per annum of SO₂, as compared with nearly 4,000 tonnes per annum from the former brick works.
- 1.5.3 Another memory of the brick works' operations that has caused anxiety about future emissions from the RRF is the belief that the presence of temperature inversions will inhibit effective dispersion and cause the air quality impacts to be greater than anticipated. Whilst it may be the case that the dispersion of the brick works' plumes were on some occasions influenced by the surface based stable layer underneath a temperature inversion, the dispersion model predictions presented in the ES have taken such meteorological conditions fully into account and can be relied upon with confidence.

- 1.5.4 The evidence base for assessing health effects of emissions to atmosphere is very strong and the analysis presented in the ES provides a clear and quantitative estimate of the consequences of the RRF proposal. When taken in the context of the health status of the surrounding population and background rates of, for example, mortality and hospital admissions, the estimated health effects can justifiably be described as negligible.
- 1.5.5 The ES also considered the long term effects of the additional exposure to dioxins and metals, through both inhalation and ingestion following uptake into the food chain. There is a non zero and quantifiable risk of contracting cancer for a local resident, but this risk is extremely small and well below the level which is generally considered to define tolerability.
- 1.5.6 The treatment and transport of bottom ash and fly ash does not represent a risk to health, because there is no viable pathway of exposure for members of the public.
- 1.5.7 One of the most visible features of the Project will be the increase in HGV vehicles on some of the local roads. Despite community concerns to the contrary, the proposed RRF is not expected to have any more than a minimal impact upon local journey times, road user or pedestrian safety, if the traffic management measures are implemented at all times. However, it is recognised that being passed by a large vehicle may reduce the amenity value of some stretches of road for pedestrians and cyclists.
- 1.5.8 Similar reduced amenity is strongly perceived by local residents to be inevitable on local footpaths and green spaces, principally as a result of the RRF visual impact. This lessened enjoyment may reduce the levels of physical activity of users, if they cease to use the areas as frequently as at present or do not access alternative areas, with possible implications for their physical health.
- 1.5.9 The employment opportunities offered by construction and operation of the RRF are unlikely to have any measurable benefits for health in the local communities. There will be some additional employment and income from the indirect effects of the additional employment.
- 1.5.10 The evidence for an effect on house prices is sparse and partly contradictory. No definitive prediction can be made on the effect that the Project might have on house prices in the short term, although the possibility that prices might be depressed for a period of time is plausible, ie for a number of years. In these circumstances, there could be an effect on the wellbeing of individuals who see a reduction in the price of a property they wish to sell.

- 1.5.11 The most likely adverse effects on health and wellbeing identified are associated with peoples' feelings about the area. Should such feelings about the local environment be widespread and entrenched, then there will be some consequent adverse health effects, in the form of mental health and possibly stress. Such health effects are not possible to define in quantitative terms and are subject to uncertainty. It should be observed that such a response at the community level has not been reported in other host communities in the UK for EfW facilities in the UK or elsewhere and such an outcome here can only be regarded as speculative.
- 1.5.12 The scheme has the potential to bring some health benefits through the provision of an enlarged Public Rights of Way network, provision of community trust funds and limited additional employment opportunities, especially if these are taken up by members of the local community.
- 1.5.13 Finally, it should be noted that this HIA has considered the effects on the host community of a specific Project to treat half a million tonnes of residual waste. Whilst there is a genuine 'do nothing' scenario for the people affected in this case, there is no 'do nothing' scenario for the waste to be treated. Whichever treatment method is adopted, at whatever location or locations, there is an associated health effect.

1.6 Recommendations

- 1.6.1 ERM proposes the following recommendations to minimise the negative impacts to health and maximise the positive impacts. Covanta's response to these recommendations can be found in *Annex D* of the HIA main report.
- 1) ensure that tree planting is carried out in such away as to achieve the maximum and the earliest screening when the RRF is viewed from nearby green space.
 - 2) ensure open communication and sharing of information, including:
- 1.6.2 the display of emissions data on the website and in the visitors centre, in a form that is accessible and as close to real time as possible;
- 1.6.3 the provision of information on Covanta's operations and issues globally (notably in the USA);
- 1.6.4 the production and distribution of regular newsletters describing project progress, highlights, emissions data and any formal breaches of permit etc; and

- 1.6.5 a demonstration that the processes and procedures for dealing with bottom ash and fly ash cannot result in harm, even in the event of road traffic accidents.
- 1) provide transparency around the methodology used to develop community benefits programmes;
 - 2) establish a community complaints procedure in addition to the retention of the Community Liaison Panel; and
 - 3) communicate the plans for responding to accidents within the Operations Area, as contained in the Environmental Permit application for example.

Construction Recommendations

- 1.6.6 The following measures specific to construction should be adopted:
- 1) ensure contractors are signed up to the Considerate Constructors Scheme and that they operate best practice in this regard;
 - 2) Communicate information regarding construction activities throughout the construction period to the most local communities; and
 - 3) Ensure that the construction site area is secure and not vulnerable to trespass.

Operation Recommendations

- 1.6.7 The following measures specific to operation should be adopted throughout the lifetime of the Project.
- 1) implementation of effective maintenance and upgrading of facility as appropriate, including fitting of best practice technology when available, as directed by the Environment Agency as part of the Environmental Permit review; and
 - 2) appropriate and sensible procedures should be put in place to prevent inappropriate waste being put in the furnace and these procedures should be explained to the Community Liaison Panel.

2.0 Introduction

2.1 Background

- 2.1.1 Covanta Rookery South Limited (Covanta) is submitting a Development Consent Order (DCO) Application to the Infrastructure Planning Commission (IPC) to construct and operate a Resource Recovery Facility (RRF) at Rookery South Pit near Stewartby.
- 2.1.2 The Rookery South RRF has two main elements:
- 1) an Energy from Waste (EfW) Facility exporting enough electricity to meet the needs of approximately 82,500 homes (broadly equivalent to the needs of Bedford and the Marston Vale); and
 - 2) a Materials Recovery Facility (MRF) recovering secondary aggregate and metals from the Rookery South EfW process.
- 2.1.3 The Project includes areas for HGV and staff car parking to service the RRF, a new junction and upgraded road access from Green Lane, as well as an underground connection to the National Grid. 85% of vehicle deliveries will be between 7am and 5pm, with the remainder expected between the hours of 5am and 11pm.
- 2.1.4 Significant new tree planting is proposed, together with upgrades to local footpaths in the area, both of which will make a meaningful contribution to the Forest of Marston Vale.
- 2.1.5 There is no statutory requirement to carry out a Health Impact Assessment (HIA) for this Project. However, responses to the Preliminary Environmental Report (PER) published in February 2010 indicated that human health issues were a concern for some stakeholders, including NHS Bedfordshire and the Health Protection Agency (HPA). As such, Covanta commissioned an independent HIA.
- 2.1.6 This HIA forms part of a suite of documents that comprise the Application to the IPC. Therefore, the document needs to be read alongside the Environmental Statement (ES) accompanying the Application for the Project. The aim in undertaking this work has been to provide all interested parties with an overview of the Project's implications for health, drawing on the work undertaken for the ES.

2.2 Defining Health And Health Impact Assessment

What is 'Health'?

Definition

2.2.1 Health, or more importantly what constitutes good health, is difficult to define and to measure in all its aspects for a population, not least because perceptions regarding health and expectations of good health vary. Following best practice, this HIA takes the World Health Organization's (WHO) definition, which states that health is

"a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity"².

2.2.2 The use of this definition influences the scope and nature of the HIA.

A Socioeconomic Model of Health

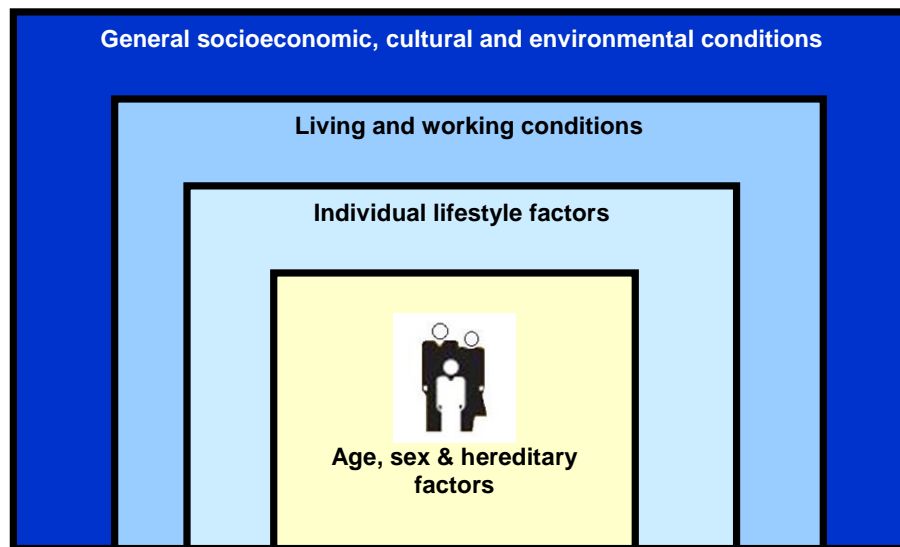
2.2.3 The WHO definition of health requires that a broad socio-economic model of health is used in this HIA.

2.2.4 For any individual, health is determined by a multitude of factors including:

- 1) age and genetics, which cannot be changed for that individual;
- 2) individual lifestyle factors with regard to choices over level of physical exercise, alcohol consumption, tobacco smoking, etc; and
- 3) external factors reflecting the wider environment and the socio-economic context in people live and work.

2.2.5 A common way of summarising these factors is shown in Figure 2.1, which illustrates a model of the so-called 'determinants of health'. These determinants can be related to the individual and the wider environment.

² World Health Organization, (1948), Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946

Figure 2.1 Socio-economic Model of Health³

- 2.2.6 Subsequent to lifestyle factors, social and community networks are considered to be important for a person's health and wellbeing. If these networks are strong, evidence suggests that health is improved. Isolated individuals, on the other hand, have poorer health (see Annex A).
- 2.2.7 The outer layer in the diagram represents the socio-economic, cultural and environmental background, including the physical environment (eg air quality), good quality housing, access to medical services, transport, and employment, which are also important in determining health.
- 2.2.8 The level of understanding of how each of these determinants affect health varies but can be defined with some confidence, although no list can be completely comprehensive, especially where the definition of health includes wellbeing, as in this HIA.
- 2.2.9 In conducting an HIA, the effect of the Project under consideration on these determinants has to be considered. This is done by defining health 'pathways'. A health pathway can be described as any activity that influences a known determinant of health. These pathways are discussed further in Section 3.

³ Modified from Dahlgren, G. and M. Whitehead. (1995). Tackling Inequalities: A Review of Policy Initiatives. In Tackling Inequalities in Health: An Agenda for Action, eds. M. Benzeval, K. Judge, and M. Whitehead. London: Kings Fund Institute

Models for HIA

- 2.2.10 HIA is a developing field, but there is an extensive and growing body of knowledge and guidance. However, no statutory guidance exists and HIA tend to employ different methods, to meet individual project requirements.
- 2.2.11 This HIA employs guidance and methods set by the National Institute of Clinical Excellence (NICE), formerly the NHS Health Development Agency, and the World Health Organization.
- 2.2.12 As outlined in the guidance according to the Gothenburg consensus (a consensus paper developed by amongst others the WHO, the Nordic School of Public Health and the European Commission which is designed to provide a common understanding and approach to undertaking HIA) HIA is
- ...a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population⁴.*

2.3 Aims and Objectives of the HIA

- 1) to determine the potential health impacts of the proposed RRF on nearby residents, including identifying inequality issues.
- 2) to identify ways to maximise positive and minimise negative impacts.
- 3) to inform the decision making process and to respond to health issues raised through this process.

2.4 Scope and Structure of the HIA

- 2.4.1 The scope of the HIA is dictated by the aims and objectives listed above, along with the method adopted and the geographical area.
- 2.4.2 The remainder of this report is structured as follows:
- 1) Section 2: Method;
 - 2) Section 3: Project profile;
 - 3) Section 4: Community profile;
 - 4) Section 5: Stakeholder engagement;
 - 5) Section 6: Literature review;

⁴ World Health Organization (1999) Health impact assessment: Main concepts and suggested approach. Copenhagen: World Health Organization.

- 6) Section 7: Impact assessment; and
- 7) Section 8: Recommendations.
- 8) Annex A: Evidence base;
- 9) Annex B: Community profile;
- 10) Annex C: Stakeholder Engagement; and
- 11) Annex D: Covanta's Response to the HIA.

3.0 Method

3.1 Screening

3.1.1 The need for the HIA was identified as a result of responses to the PER, and in order to meet the requirements of the IPC that all documents be submitted 'upfront'.

3.2 Scoping

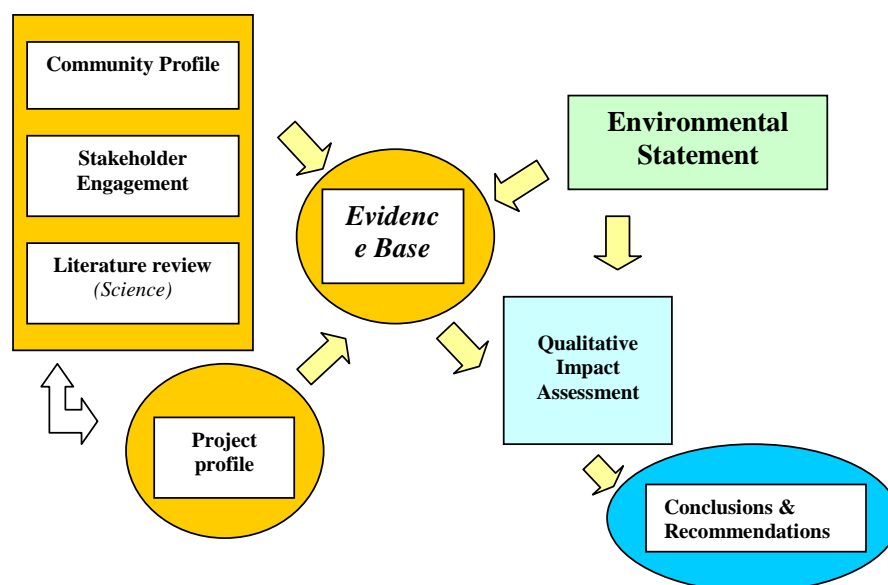
3.2.1 NHS Bedfordshire was consulted on the extent and scope of the HIA required. Based on this input, responses to the PER, the known vulnerabilities of the local population and the likely health impacts from the Project based on previous HIA undertaken for similar projects, it was determined that a full HIA, including a programme of stakeholder engagement, would be most appropriate.

3.3 The Assessment

3.3.1 The overarching method applied includes the compilation of an evidence base consisting of a community profile; findings from stakeholder engagement and evidence from published literature, as well as the results of the ES, which are used as the basis for assessing the likely health impacts of the Project.

3.3.2 The method used is represented in Figure 3.1.

Figure 3.1 HIA Method



Project Profile

- 3.3.3 The project profile investigates the various stages and processes involved during construction and operation of the Project. It defines the footprint of the Project, the extent of activities that may result in potential health outcomes, and the influence they may have upon a range of determinants of health. In this way, the project profile identifies the potential health pathways.
- 3.3.4 Once activities and their associated impacts have been outlined, they can be applied to the community profile. This will determine how such pathways might act on the relative susceptibilities of communities, using the HIA evidence base to identify a range of possible social, physical, mental and community health outcomes.
- 3.3.5 The purpose of the project profile is to identify those relevant features associated with the Project that are potential influences on the determinants of health, introduced in Section 2.2, such as:
- 1) the physical environment (eg noise, air quality and visual factors);
 - 2) employment and income;
 - 3) education;
 - 4) housing;
 - 5) lifestyle;
 - 6) physical activity;
 - 7) access to services, amenities and social networks;
 - 8) community severance or cohesion;
 - 9) transport;
 - 10) social networks and connectivity;
 - 11) community identity; and
 - 12) access and accessibility.
- 3.3.6 The potential of these determinants to be influenced by the Project has been considered by the ERM team, using the knowledge provided by the evidence base, ie the literature review, the community profile and the views of stakeholders.

Community Profile

- 3.3.7 The community profile has been developed through the application of national statistics such as the National Census 2001 and the Indices of Multiple Deprivation (IMD) 2007. Data have been collected at the smallest (most local) area possible. However, the amount of small area data available on health is restricted.

- 3.3.8 The combination of statistics and available survey information develops a picture of existing community susceptibilities and inequalities, including pockets of relative deprivation or affluence, which is used to inform the assessment and to identify vulnerable groups.

Stakeholder Engagement

- 3.3.9 Stakeholder engagement is a key stage and an inherent principle within HIA, as associated health outcomes are largely dependent on the particular circumstances of communities, lifestyle, inequality and subsequent relative susceptibility. Although national statistics can be applied to profile community health and susceptibility, they will not uncover the concerns, perceptions and circumstances that are needed to assess all the potential health impacts.
- 3.3.10 Therefore, engagement is crucial in gaining local knowledge and insight, alongside the particular concerns of actual, perceived health impacts and benefits, assisting in more health conscious decision-making.
- 3.3.11 The methods and process of stakeholder engagement are described further in Section 5, along with the links with the wider consultation that was undertaken for the Project.

Literature Review

- 3.3.12 A literature review has been performed to collect evidence on the potential health impacts associated with the Project. This was based on reviews of the literature on health effects associated with the various elements of the RRF and included a review of completed HIA on EfW Facilities, Waste Management Policies and Position Papers by various groups and authorities. The effects on health of the following topic areas were considered:
- 1) air quality;
 - 2) transport;
 - 3) noise;
 - 4) visual environment;
 - 5) socioeconomics; and
 - 6) social capital.

- 3.3.13 The literature review is not a systematic review of all the available literature on these topics, but is based on literature that is nationally or internationally recognised, peer reviewed and which draws on a variety of sources of evidence and is generally considered to be the strongest available evidence. Almost all the literature included in the review is publicly available. The literature reviews also includes other published HIA (apart from those undertaken previously by ERM) on a similar or related issue.
- 3.3.14 These criteria provide a strong, defensible scientific evidence base on which to undertake the impact assessment.

Analysis

- 3.3.15 The analysis stage investigates and appraises potential outcomes and benefits, incorporating environmental and health data to identify populations at risk. It assesses the maximum theoretical impacts with a view to developing recommendations that reduce or avoid negative impacts/inequalities and enhances opportunities to improve health.
- 3.3.16 This has been achieved by identifying activities with identifiable health pathways and outcomes and applying them to the community profile to express exposure and sensitivity.
- 3.3.17 Potential impacts were identified based on the findings of the ES, the evidence base (including a review of previous HIA assessments) and the findings of the stakeholder engagement process, including the local community's views.
- 3.3.18 The analysis also provides a qualitative judgment as to the likelihood and magnitude of the potential health outcomes.

Recommendations

- 3.3.19 This section aims to identify means of avoiding unnecessary damage to a community's health, healthcare services and social services etc and to promote and to maximise any benefits associated with the Project. Thus, recommendations are developed to avoid, minimise, reduce or remedy the negative impacts identified, and to create or to enhance health benefits.
- 3.3.20 Recommendations made in the HIA are subject to review and scrutiny by participants in the IPC process. They may be considered for inclusion in any requirements included within any DCO or accompanying legal undertaking such as a Development Consent Obligation. In addition, they could be taken up by Covanta in the interests of promoting good relations with the host community.

3.3.21 Recommendations (sometimes referred to as mitigation) are also an outcome of the ES and many of these will have benefits for health. Therefore, the HIA does not repeat these measures. However, for the reader's convenience, mitigation measures from the ES that will influence health impacts are presented.

3.4 Governance of the HIA

3.4.1 In the early part of the HIA, ERM met with Dr Fiona Head of NHS Bedfordshire to discuss the scope of the HIA and the approach to stakeholder engagement. In addition, the HIA process was explained to the Community Liaison Panel (CLP) established for the Project.

3.4.2 This HIA was written by Environmental Resources Management (ERM) an independent consultancy. The findings of the HIA have not been influenced by Covanta. The HIA findings are based on the scientific literature, the findings from the stakeholder engagement and the judgement of the assessors at ERM who do not have a stake in the outcome of the Application

3.4.3 No written Terms of Reference exist for this HIA, as is common in the commercial sector, so none can be presented here. As a result, the geographical, temporal and population scope evolved through the assessment process.

3.5 Constraints and limitations of the HIA

3.5.1 There were no major constraints in undertaking the HIA, although the following limitations should be noted;

- 1) The community profile information is only available at a ward level; smaller area statistics are not available. In addition, community profile data at ward level are primarily from Census 2001 data which are now nine years old.
- 2) Recent changes in the administrative boundaries of the local authorities in Bedfordshire mean that directly comparable area data over recent years were not available for some health indicators.
- 3) The HIA was commissioned during the latter stages of the pre-application process and has been undertaken within a timeframe defined by the submission date for the DCO Application.

4.0 Project Profile

4.1 The Project

Introduction

- 4.1.1 This section provides a description of the Project, from the perspective of its implications for determinants of health. A full description of the Project can be found in Chapter 3 of the ES accompanying the Application. Full versions of the figures within this report can be found in the Plans that accompany the Application.

The Site

- 4.1.2 The Application Site, shown in Figure 4.1 below, is for the most part, located within The Rookery Pits, between Milton Keynes and Bedford. Bedford town centre is situated approximately 9km north east of The Rookery, whilst Ampthill, a local market town, lies approximately 3km south east of The Rookery. The existing A421 is approximately 2km to the west of The Rookery Pits and the B530 lies to the east of the Application Site, running north-south between Bedford and Ampthill.
- 4.1.3 The Rookery Pits comprise two large former clay pits, Rookery North and Rookery South, separated by an east-west spine of unexcavated clay, together covering an area of approximately 210ha. The pits, now disused, supplied Oxford Clay for brick manufacture at the London Brick Company works at Stewartby and are typical remnants of past industrial land uses within Marston Vale. The existing features of the Application Site are shown in Figure 4.2.

Figure 4.1 Site Location

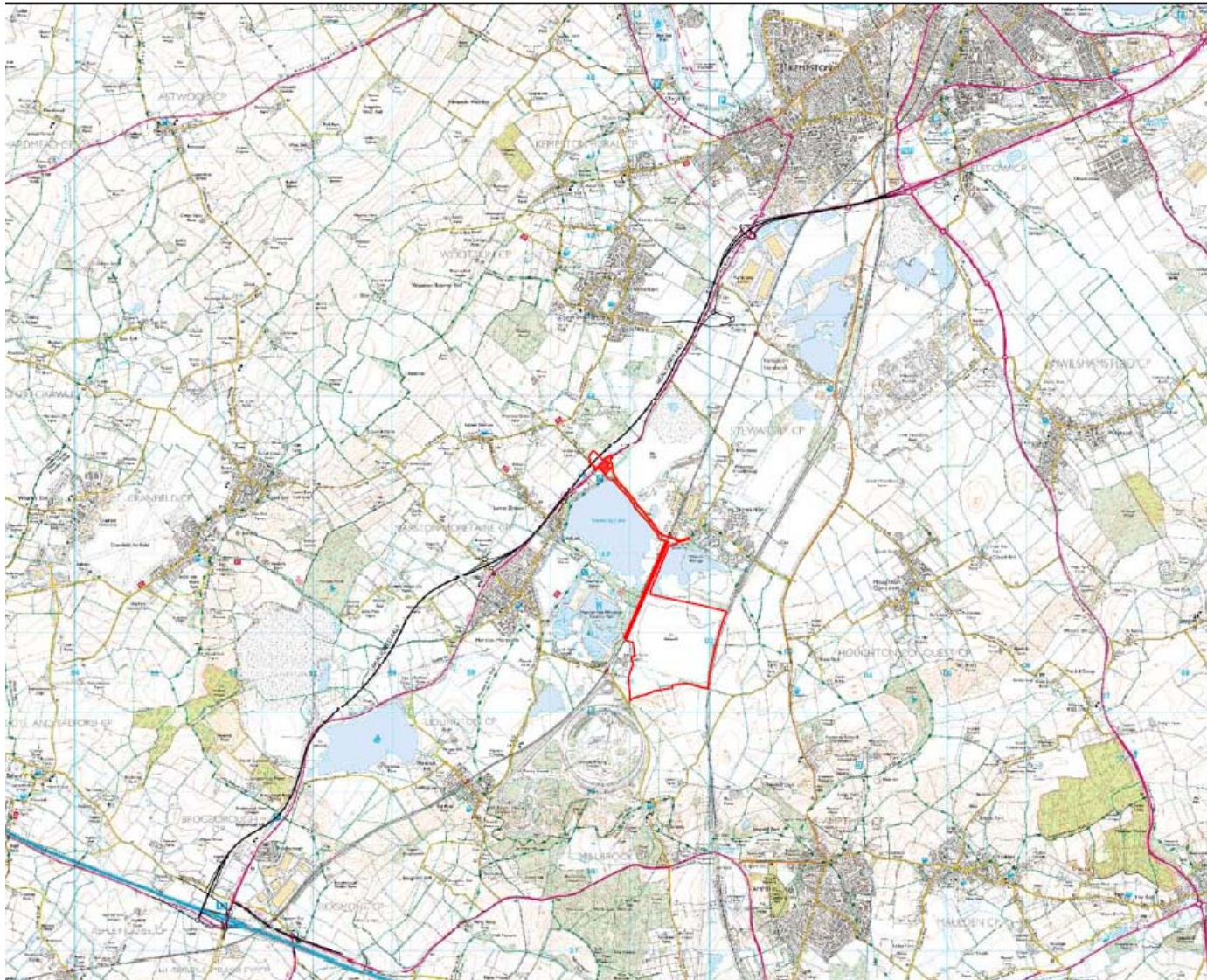
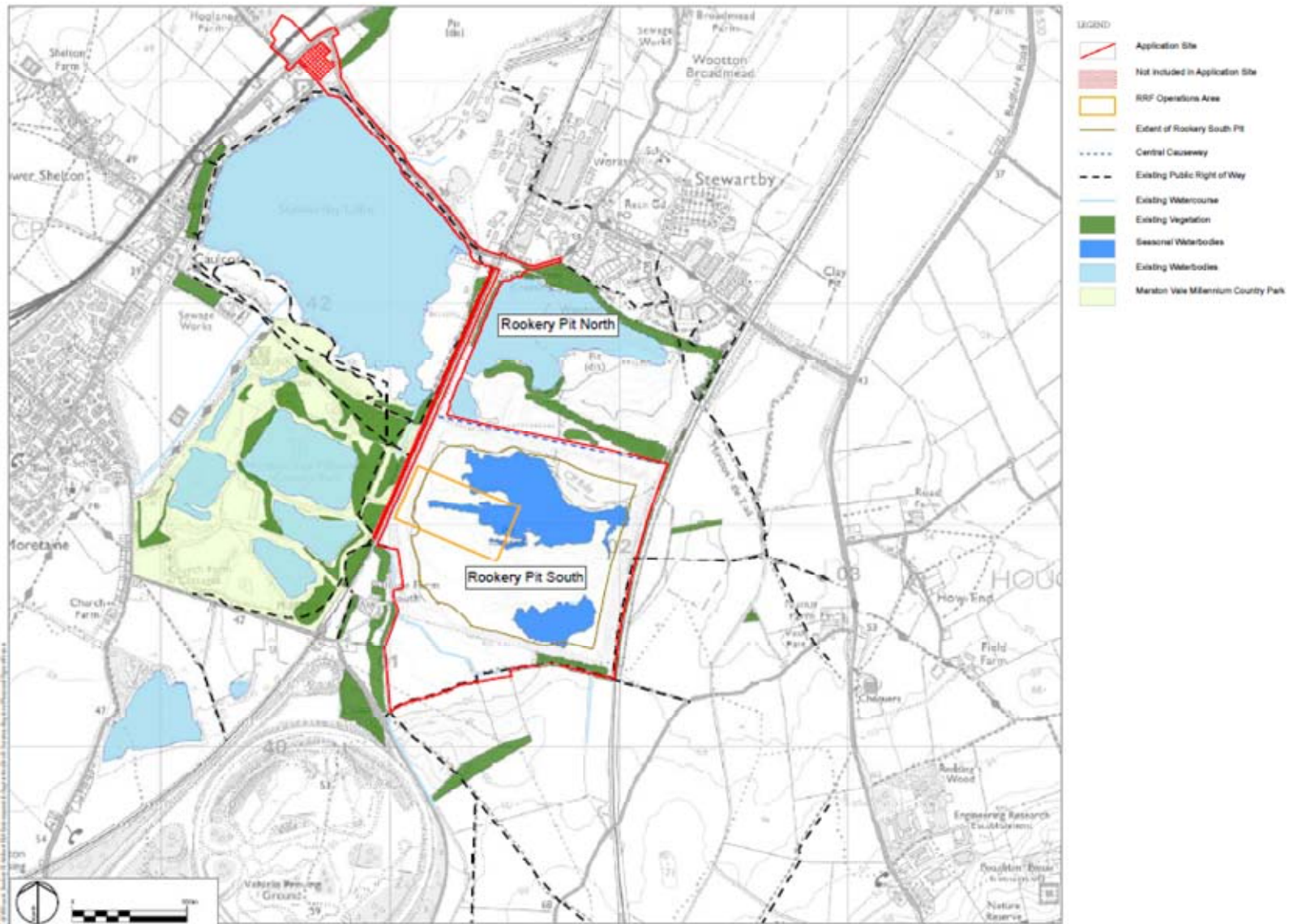


Figure 4.2 The Application Site (existing features)



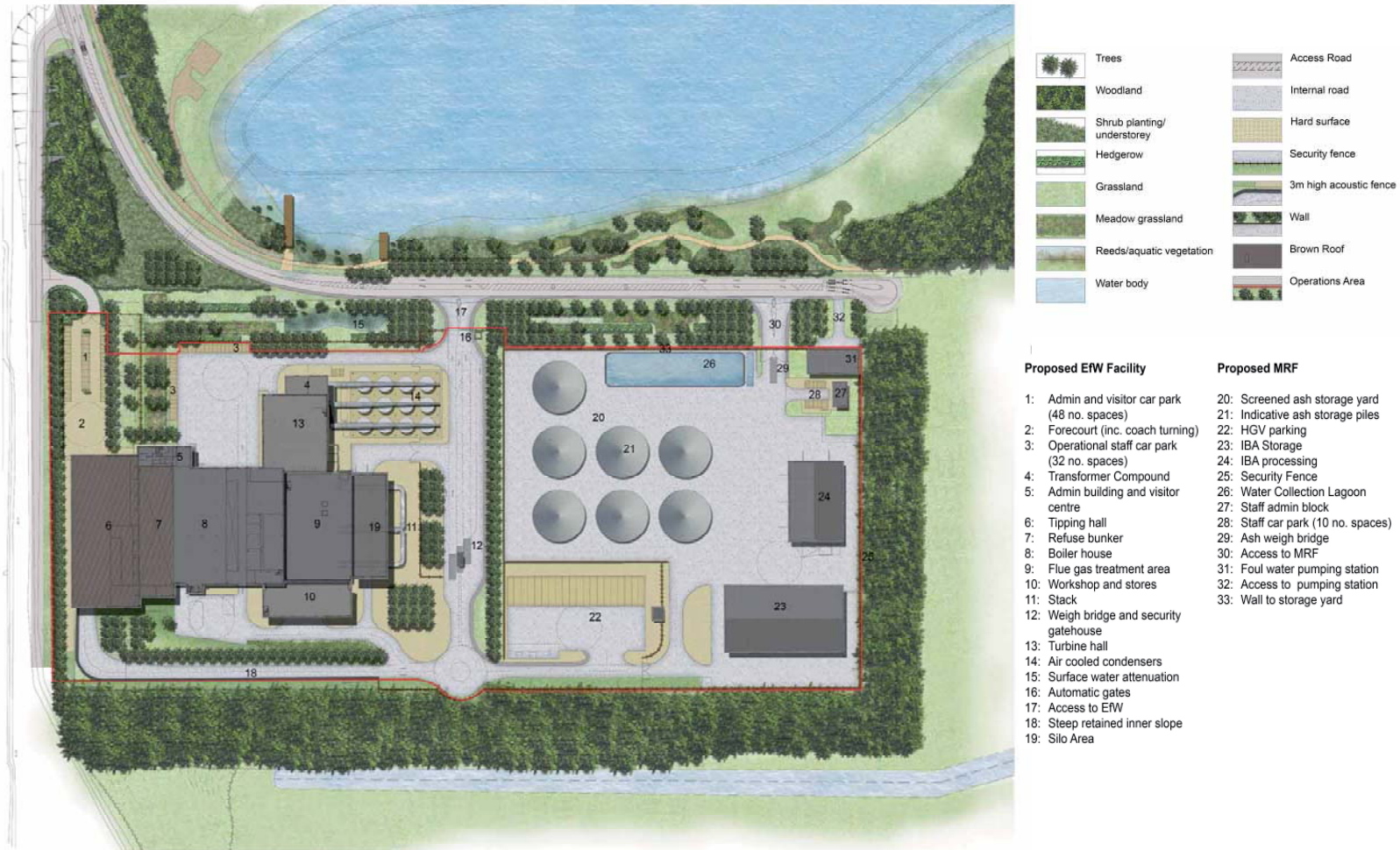
4.2 The Resource Recovery Facility (RRF)

Overview

4.2.1 The key components of the Project, as described in the ES and shown in Figure 4.3, are:

- 1) **an Operations Area:** this contains the RRF, and includes the EfW Facility; the MRF; weighbridges; a security gatehouse internal site roads and hard standing areas; parking provision for cars, light goods vehicles (LGV) and heavy goods vehicles (HGV); boundary fencing;
- 2) **the EfW Facility:** access ramp; tipping hall; refuse bunker; boiler house; flue stack and Flue Gas Treatment area; CHP provision; administration offices; visitor centre / educational facility; turbine hall; workshop and stores; air cooled condensers and transformer compound;
- 3) **the Post Treatment MRF:** ash storage yard and water collection lagoon, buildings for untreated ash/ash processing;; staff administration block; weighbridge, pump house;
- 4) **transport infrastructure:** site access arrangement and level crossing improvements.
- 5) **connection to utilities:** including water, foul drainage and electrical grid connection, for export of generated power;
- 6) **a landscape strategy:** woodland planting, earth bunding, wetland area and use of green walls and brown roofs on the EfW Facility;
- 7) **rights of way strategy:** upgrading existing paths, to dedicated routes, with cycle uses and providing interpretation facilities; creation of second formal access into the Country Park;
- 8) **a lighting strategy:** enhance Green Lane lighting and level crossing lighting; lighting the Operations Area and the stack - the access road is not to be lit: and
- 9) **a surface water drainage strategy:** use of the Rookery South attenuation pond; provision of a swale; and localised alignment of a drainage ditch.

Figure 4.3 Operations Area



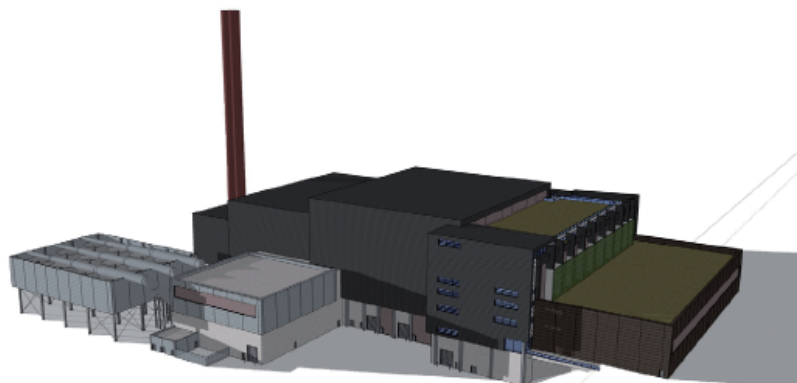
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Key Aspects of the Project

The EfW Facility

- 4.2.2 The EfW Facility is the largest structure within the RRF, comprising a reception hall and tipping apron, a bunker into which the waste is tipped, a boiler house, an ash collection bunker, a flue gas treatment area, and staff welfare and administration offices. Additionally, the Facility includes a number of ancillary buildings connected to the main building, including the turbine hall, workshop and stores as shown in Figure 4.4.
- 4.2.3 The EfW Facility is a 3-stream plant and thus requires 3 separate flues, which are formed into a single stack.
- 4.2.4 Key dimensions of the EfW Facility are as follows:
- 1) stack height (top of stack): 105m;
 - 2) maximum roof height of facility: 43m; and
 - 3) total area of main plant buildings: 15,800m².
- 4.2.5 The refuse bunker will have an approximate storage capacity of four days' waste supply to the EfW Facility. Consequently, even complete, short-term, plant shutdown would not prevent vehicles continuing to deliver waste.
- 4.2.6 A visitor centre/educational facility will also be located within the EfW Facility, providing a resource available to organised parties wishing to visit and to understand how the EfW Facility operates and its role within the overall waste management system. The visitor centre/educational facility will incorporate meeting rooms, amenity facilities, disabled access, multi-media equipment and display facilities. It will be designed to be flexible so that its use can accommodate a range of age groups and interests.

Figure 4.4 The EfW Facility



The MRF

- 4.2.7 The MRF comprises two steel-clad buildings adjoining a screened concreted yard to store untreated ash and house the ash screening operations. The buildings are a maximum of 13m high. The ash will be stored to a maximum height of 10m and the yard is surrounded by a 3m high wall that contains and defines the screen ash storage yard.
- 4.2.8 The Project will also have the capability for Combined Heat and Power facility ('CHP') for off-site users of process or space heating.

Hours of Operation

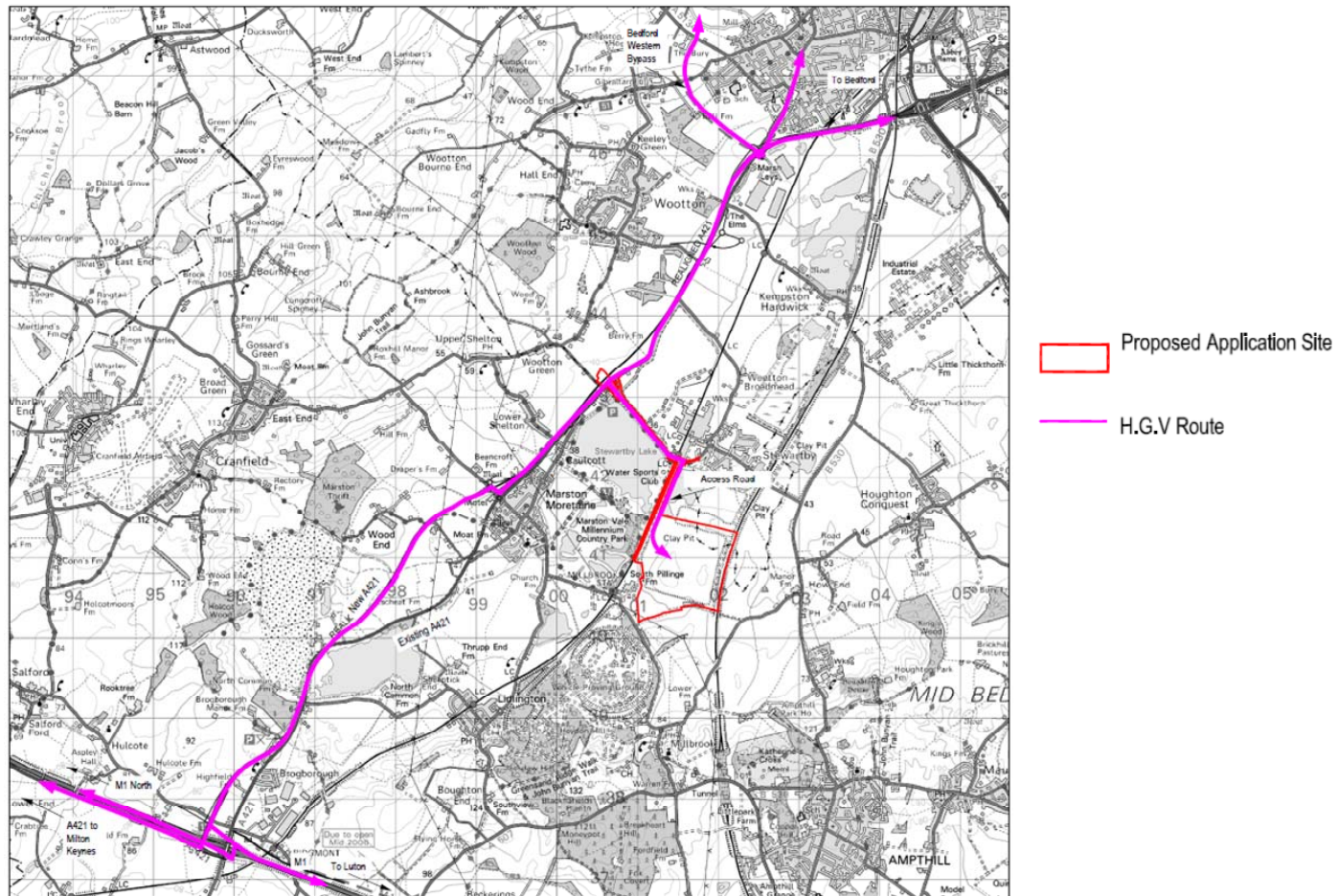
- 4.2.9 The EfW Facility will be operational for 24 hours per day, 365 days per year. Deliveries of residual waste will be restricted to between 05.00 and 23.00. No waste will be accepted on Sundays, Christmas Day, New Year's Day or Easter Day, except under exceptional or emergency circumstances.
- 4.2.10 The normal operational hours of the MRF will be:
- 1) Monday to Friday: 7.00 to 18.00; and
 - 2) Saturday: 7.00 to 14.00, with no operations outside of these times except under exceptional or emergency circumstances.

Vehicular Movements and Site Access

Movements

- 4.2.11 Material will be supplied to the RRF by road, generating a total of 530 daily trip movements per day (265 trips in and 265 trips out).
- 4.2.12 Whilst the EfW Facility will be operational for 24 hrs a day, 365 days a year, the hours of waste delivery will be limited to between 05.00 and 23.00. 85-90% of the vehicle movements generated will be undertaken between 07.00 and 17.00 hours. Of the remaining 10-15% of vehicle movements, the majority (up to 12%) of movements will be in the period between 05.00 and 07.00 and will be exiting the site, whilst access between 17.00 and 23.00 is primarily to allow vehicles to return to the site for overnight storage and the volume of movements at this time will be very low.
- 4.2.13 HGV will follow the approach routes shown in Figure 4.5 into the RRF.

Figure 4.5 HGV Approach Route



- 4.2.14 To allow for the necessary staff, visitor and delivery parking, a dedicated forecourt will be provided to the north of the EfW Facility with 48 staff car parking spaces, 20 covered cycle parking spaces and an allocated space for one 53-seater coach. An overnight parking area for approximately 20 HGV (waste delivery vehicles) is located to the south west corner of the area dedicated to the MRF. This will ensure that the vehicles can be parked in a secure and appropriate location. A third vehicle lane on approach to the Security Gatehouse will allow operational vehicles to park without causing congestion at the site entrance.

Pedestrian/Footpath Access Road

- 4.2.15 A road will be constructed to allow vehicular access into the site. A centre island is proposed to provide pedestrians with a safe waiting point when crossing this access road. Along the eastern side of the access road, a footway/ cycleway is to be provided which will cross the access road approximately 70m south of its junction with Green Lane, using a 'centre refuge island'. The access road has been designed to adoptable standards and will not be lit.
- 4.2.16 A pedestrian/cycle route will be constructed linking the access road to the west of the site access. This route will provide an improved link for pedestrians/cyclists joining the public highway, accessing the station and will provide improved access to the Millennium Country Park.

Security

- 4.2.17 The EfW Facility entrance will have automated gates that are remotely controlled from the self-contained security gatehouse which will be provided. A 3m high security fence will be erected around the periphery of the Operations Area.

Hazardous Waste

- 4.2.18 Where hazardous wastes such as cement bonded asbestos, car batteries or fluorescent tubes are delivered to the RRF and identified, these will be segregated and sent for treatment/disposal at a suitably licensed waste management facility.

Employment

4.2.19 The workforce for the construction of the development will average around 320 employees over the anticipated 39 months construction period, with a peak of around 640 employees. The operation of the Project will generate approximately 80 permanent jobs on site: 68 employees in the EfW and 7 operating the MRF. In addition, there will be a transport manager and 11 HGV drivers based at the RRF, although the drivers will be off-site collecting waste for the majority of the time. . Further details are provided within Chapter 16 of the ES.

Landscaping

Landscape Strategy

4.2.20 A landscape strategy has been developed for the Project, setting out a number of additional works, including:

- 1) the retention, management and inter-planting of existing areas of woodland within Rookery North and Rookery South and to the west of the Marston Vale railway line to provide continued and enhanced screening over time. This will form part of a future agreed Landscape and Ecological Management Plan;
- 2) earth bunding and associated woodland planting extending around the southern and eastern sides of the Operations Area providing screening of the lower level buildings and operational activities such as vehicle movements;
- 3) additional perimeter woodland planting on the eastern and southern edge of the Rookery South Pit providing better connectivity with other woodland areas and to support compliance with the Marston Forest policy of 30% tree cover;
- 4) the establishment of an informal wetland setting to the Operations Area in views from the north with enhancements to the southern edge of the low level restoration scheme (LLRS) attenuation pond providing planting to the wetland margins;
- 5) the establishment of a new woodland and tree screen planting setting to Green Lane in the vicinity of the proposed vehicular entrance to the RRF and in land west of the Marston Vale line adjoining the Marston Vale Millennium Country Park, forming an additional entrance to the Country Park from the north;

- 6) formal planting within the Operations Area and in areas north of the Operations Area comprising tree lines and tree blocks which contrast with the more informal peripheral woodland fringe described above; and
- 7) the establishment of green walls and brown roofs on the western portion of the EfW Facility, responding to the Marston Vale Millennium Country Park setting. Green walls provide a means of integrating the building in views from the more immediate landscape of the Forest of Marston Vale and Marston Moretaine.

Rights of Way Strategy

4.2.21 The Project will establish a comprehensive upgrading of the existing and approved rights of way network across Rookery North Pit and Rookery South Pit as part of a LLRS. New rights of way links will also be established, connecting existing rights of way and footways to the east and west of the The Rookery Pits. The ROW strategy is outlined in more detail in Chapter 8 of the ES, and includes:

- 1) upgrading the dedicated circular footpath around Rookery North;
- 2) upgrading the dedicated footpath formed under the LLRS adjacent to the Midland Mainline to include dedicated cycle rights;
- 3) a new dedicated footpath with cycle rights between the circular footpath around Rookery North Pit and the Green Lane level crossing/footway to the west;
- 4) a new dedicated footpath between Green Lane and the circular path around the edge of Stewartby Lake, improving access to the Millennium County Park from Green Lane and Stewartby railway station.

4.3 Interaction with other proposals

4.3.1 A wide range of proposals exist for the areas surrounding the Application Site. Figure 4.6 below illustrates the location of these. The viability of the proposed RRF is not dependent upon any of these proposals.

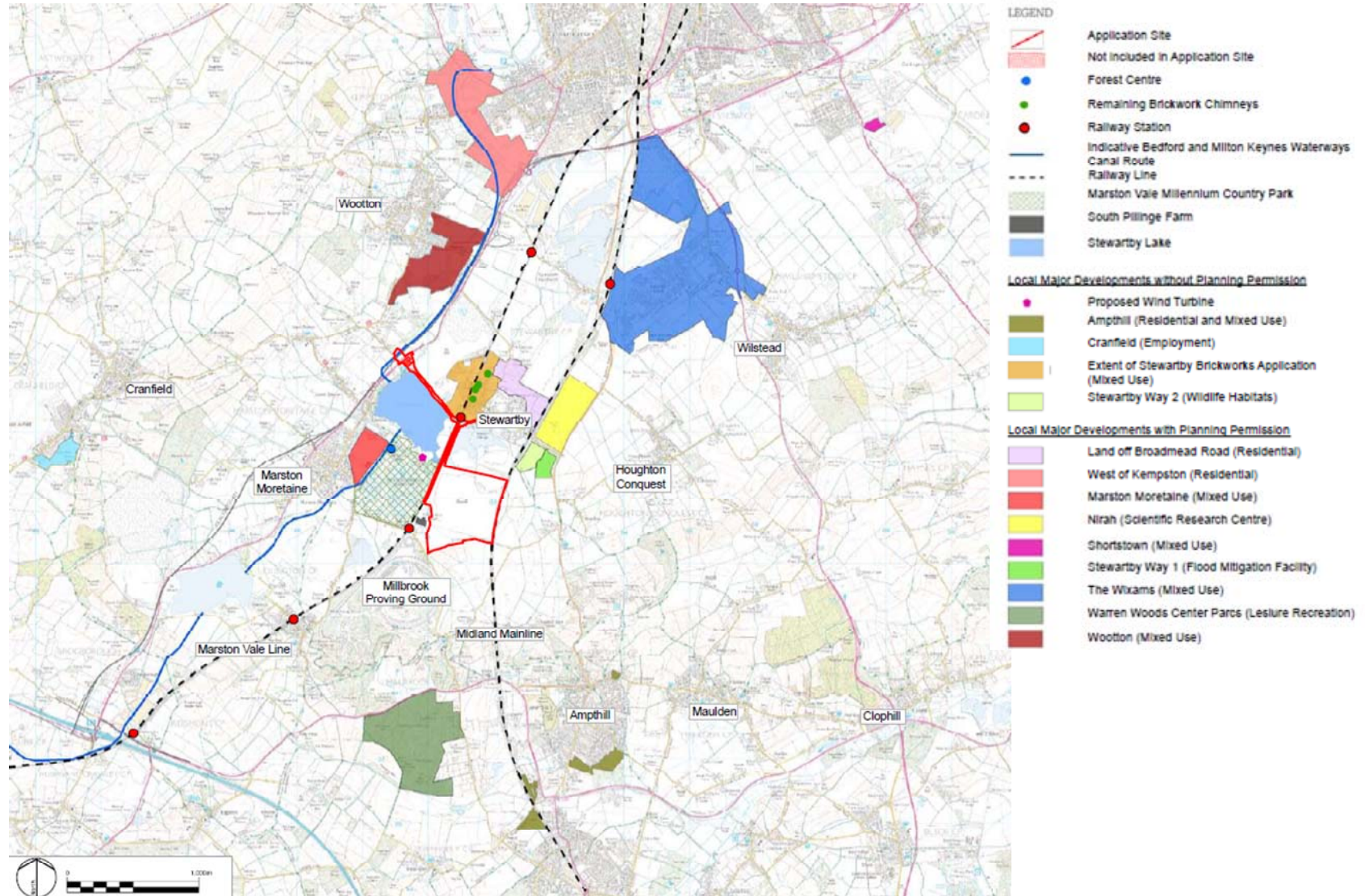
4.3.2 These include, notably the following.

- 1) **National Institute for Research into Aquatic Habitats (Nirah)** –a research facility, tourist attraction (including a tropical biotope, a Water Adventure Park, spa, hotels, a conference and exhibition centre) and associated uses including a dedicated Park and Ride; covering over 40ha. Full planning permission was granted in Autumn 2009; the construction timetable is unknown.
- 2) **Wind Turbine** - construction of a single turbine with a maximum overall height of 120.50m in Marston Vale Country Park. The total construction area for the works would be less than 0.55ha. The construction works would be for a 3 month period; the wind turbine will have an operational life of 25 years after which the turbine will be dismantled and the site reinstated.
- 3) **The Wixams** – building and engineering works for a mixed use development of residential (4500 houses), employment, retail, leisure and community uses, open space and associated uses, together with supporting infrastructure. The construction expected to last for the next 15 years.
- 4) **Center Parcs** - development and use of land as a forest holiday village including 700 villa, 75 bedroom hotel, 12 bedroom spa accommodation, central buildings and facilities, staff accommodation, 1400 space car park. main access onto Ford Field Road, engineering operations and lakes, hard and soft landscaping and forest management works together with associated works and activities (all matters reserved except means of access). Construction is expected to commence in 2010 and last for 1-2 years.

4.3.3 However, the ES identifies that there will be no major cumulative and direct health impacts from the RRF and these proposals should they be realised. The recent closure of the Stewartby Brickworks, and the cessation of its unpopular sulphur pollution, has encouraged members of the local population to believe that the locality would not have any further ‘intrusions’ into their landscape that might be viewed negatively. The possible realisation of several new developments in a relatively small area could thus have a cumulative effect on the wellbeing of some in the community, arising from a feeling of having to bear an ‘unfair burden’.

- 4.3.4 The Rookery South Pit also falls within the Northern Marston Vale Strategic Area, which is allocated in the Development Plan for significant housing, employment and regeneration uses. The RRF will contribute to the built infrastructure necessary to deliver sustainable communities, including the delivery of green infrastructure through both enhanced public access within the Marston Vale and the Community Forest and significant landscaping provision.

Figure 4.6 proposals in the vicinity of the proposed RRF



4.4 Defining the Project Profile

Function of a Project Profile

- 4.4.1 The purpose of the project profile is to identify key features associated with the Project which may potentially influence health⁵ and not to describe the RRF in detail. It is not the aim of the project profile to replicate or to reassess the findings of the EIA, but rather to take relevant information and data for consideration in this HIA.
- 4.4.2 The profile outlines potential health effects by identifying aspects of the Project which may have a health effect (project features) and then outlining the 'health pathway' affected. This allows for identification of the 'health determinant' affected and therefore an indication of the 'health outcome' and the aspects of the community that are likely to be affected.

Health Pathways

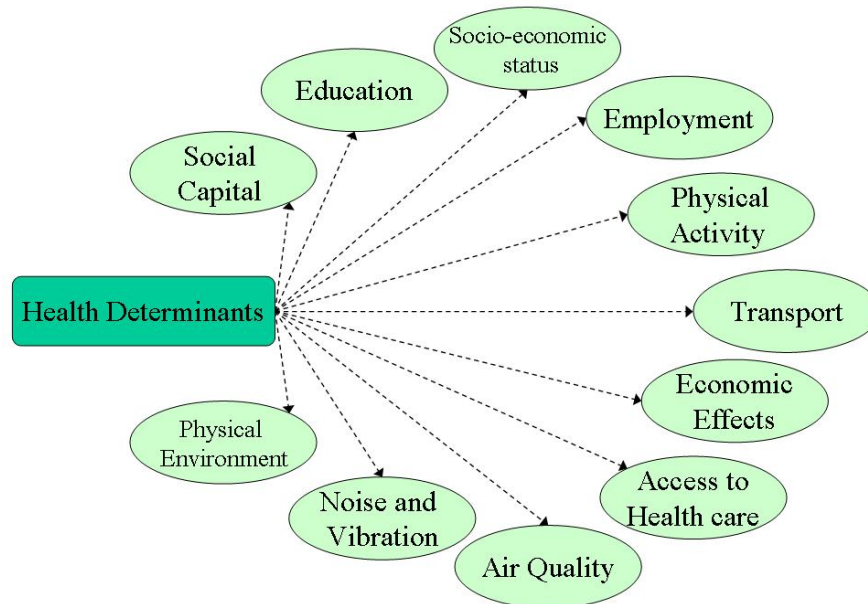
- 4.4.3 The Project may exert an influence on health determinants via what are described in this HIA as 'health pathways', which arise from consequences of the project features. Any judgement on the capacity of the Project to influence health pathways has to consider both the levels of exposure in the absence of the Project and the potential for a change in exposure.
- 4.4.4 Examples of health pathways include:
- 1) employment opportunities, with implications for improved socio-economic status, reductions in unemployment and the potential for local procurement policies and skills development;
 - 2) increased traffic, with implications for increased noise, community severance potentially affecting wellbeing and accidents resulting in injury etc; and
 - 3) changes to the visual landscape with implications for the communities sense of place and wellbeing as well as providing a focus for other concerns such as air quality.

5 World Health Organization's (WHO) definition states that health is "a state of complete physical, mental and social well being and not merely the absence of disease or infirmity."

Health Determinants

- 4.4.5 A health determinant can be any factor which has the potential to influence the health of an individual or population. Health determinants are categorised in Figure 4.7⁶:

Figure 4.7 Health Determinants



Health Outcomes

- 4.4.6 Once health pathways and their related health determinants have been identified, the effect the Project might have on them can be evaluated, to consider the effect, in turn, they may have on related health outcomes.
- 4.4.7 The definition of health is a broad one and whilst the most serious outcomes may be recorded in the health system or be recognisable in hospital outpatient or primary health care activity, many others will be more subtle and result in no contact with health or other services. These outcomes could be described as 'sub-clinical' and may also relate to the wellbeing of some parts of the community.

⁶ Europa DG Health and Consumer Protection available at http://ec.europa.eu/health/ph_determinants/healthdeterminants_en.htm

Receptor

- 4.4.8 The receptor states which group of people are most likely to be impacted by the health outcome that has been identified. Receptors can be people that live or work close to the site or along the proposed transport route.
- 4.4.9 In addition to receptors, vulnerable people will be identified. Vulnerable receptors are those individuals who will be unduly affected by the proposed development and include children, the elderly, the disabled and people of low socio-economic status.

4.5 The Project Profile

- 4.5.1 A summary of the features of the Project and its possible influence on health determinants is presented in Table 4.1 below.
- 4.5.2 A number of potential health issues have already been considered in other assessments that accompany the DCO Application or that are unlikely to pose any health risk to the community. These have not been taken forward in this assessment and include the following.
- 1) Operational site safety – the proposed workforce is minimal. Any on-site injuries which may occur to individual staff are unlikely to impact upon the local population's access to healthcare.
 - 2) Odour – due to the measures included in the design of the EfW Facility, notably the slight negative internal pressure difference, to ensure no emissions of odour from the RRF, this has been evaluated as being extremely unlikely to have an impact on the local community.
 - 3) Population growth - an increase in resident numbers will not, in itself, increase the health impact of the Project upon individuals in the local community.

Table 4.1 Project Profile via the Health Pathways

Project Feature	Possible Health Pathway	Health Determinant	Potential Health Outcome or Impact
Construction			
Noise	Noise from on-site vehicles and equipment	Physical environment	Annoyance and sleep disturbance Decreased wellbeing Decreased quality of life
Emissions to Air	Decreased air quality from road traffic emissions	Physical environment	Increased respiratory diseases short and long term Increased cardio-vascular diseases
	Dust from construction activity	Physical Environment	Nuisance and annoyance due to dust deposition Decreased satisfaction with area
Delivery of construction material	HGV movements	Physical Environment Transport	Accidents and injury Death Increase in air quality related health outcomes
Site Safety	Trespass onto site	Safety	Accidents and injury Death
Visual impacts	Visual intrusion upon landscape, from structures	Physical Environment	Decreased wellbeing

Project Feature	Possible Health Pathway	Health Determinant	Potential Health Outcome or Impact
Access and use of green space	Severed footpaths Decreased value of area Physical activity Reduced visual enjoyment	Physical environment	Decreased use of Green Space Increased incidence of health conditions related to reduction in physical activity. Decreased mental health/wellbeing
Workforce	Opportunities Migrant Workforce	Income Employment	Increased sales to local businesses Increased income to employees Employment
Visible presence of the project	Trust Quality of life Control over own environment	Social capital	Mental health/stress
	Prices and quality of housing	Housing	Mental health/stress
Operation			
Delivery of waste and removal of fly ash	Transportation of waste	Physical Environment	Annoyance and sleep disturbance Accidents and injury Death Increased respiratory diseases short and long term Increased cardio-vascular diseases
	Worker movements.	Transport	Increased risk of accidents Decreased air quality Damage to road network
Workforce	Site Security and illegal access to site	Physical Environment	Accidents and injury Death

Project Feature	Possible Health Pathway	Health Determinant	Potential Health Outcome or Impact
	Employment opportunities both direct and indirect and procurement of goods and services.	Employment	Improved incomes Improved quality of life Long term health benefits associated with life expectancy and decreased morbidity
Presence of the RRF	Associated reduction in housing value	Housing	Stress Anxiety
	Major accident occurrence	Access to health care Physical Environment	Accidents and injury Death
	Lighting regime	Physical Environment	Annoyance and sleep disturbance
Emissions to air	Decreased air quality due to stack emissions	Physical Environment	Respiratory/cardiovascular disease Chronic effects through ingested or inhaled pollutants
Visitor Centre/Educational Facility	Educational trips for local schools/colleges	Education	Provision of interactive learning opportunity
Social Capital	Trust Quality of life Control over own environment	Sense of community Sense of self-determination	Mental health/stress
Decommissioning			
Decommissioning of the proposed RRF may have an impact upon several attributes of health, but is beyond the scope of this assessment. The exact identity and nature of any such impacts can only be accurately identified nearer to the time of such a decommissioning, when appropriate plans and local context are apparent. Such a study is covered by a requirement of the DCO.			

5.0 Community Profile

5.1 Overview

- 5.1.1 A community profile is an integral part of an HIA because evidence suggests that different communities have varying susceptibilities to health impacts and benefits as a result of ethnicity, social and demographic structure and relative deprivation. The community profile therefore provides an insight to how potential impacts might act disproportionately upon some communities and sensitive people. The aim of this profile is to understand the differing susceptibilities to health impacts and receiving of benefits as a result of variations in social and demographic status and relative deprivation in the communities profiled.
- 5.1.2 The profile is based primarily on information obtained for the four within 5km of the proposed site, listed below;
- 1) Marston;
 - 2) Wootton;
 - 3) Ampthill; and
 - 4) Maulden and Houghton Conquest.
- 5.1.3 The areas of Central Bedfordshire Local Authority (LA) and Bedford Borough more broadly have also been investigated.
- 5.1.4 This section summarises the key points of the community profiling data presented in Annex B. This is based on the existing communities in the area. However, further developments in the vicinity, are likely to result in an increase in the population in the area and people arriving from other communities in other places, evidence for this can be found in the revoked Milton Keynes and South Midlands Sub Regional Strategy whose evidence base remains valid. A large proportion of the data presented is based on the last census, which was undertaken in 2001. While the census was undertaken some nine years ago, it remains the single best source of information for individual communities and comparison purposes.

5.2 Population

Population Density

- 5.2.1 Marston ward is far less densely populated than the regional and national averages. Ampthill ward, conversely, is much more densely populated than the average density and almost three times that of neighbouring Marston Ward.

Age

- 5.2.2 The age structure of the population in the Central Bedfordshire and Bedford administrative areas and all the wards around Rookery Pit is very similar to that of England as a whole. All four wards appear to have a higher percentage of people within the 0-14 age range compared to the Central Bedfordshire and Bedford administrative areas that they lie within.

Gender

- 5.2.3 Central Bedfordshire and Bedford administrative areas and the four wards mirror the gender ratio in England, with a slightly higher percentage of females than males in all areas.

Ethnicity

- 5.2.4 The population around the Application Site is dominated by white people with, on average, less than four percent of the population being black or from another ethnic minority.

Religion

- 5.2.5 The significant majority of the population is Christian in all cases, with the second highest majority stating no religion. The four wards generally reflect the religious composition of Central Bedfordshire closely. However, Wootton has a notably higher proportion of Sikhs than the surrounding areas and the national average.

5.3 Education, Skills and Training

- 5.3.1 All wards and the local authorities that they lie within show a lower proportion of their population having no qualifications than across England as a whole. This is particularly true of Ampthill ward, where only 19% of the population has no formal qualifications, compared to 29% across England. The ward of Ampthill further deviates from this profile by showing a much higher proportion of people with the highest level of qualifications than in the other wards and Central Bedfordshire that it lies in or England as a whole.

5.4 Employment

- 5.4.1 On average, all four wards have higher levels of full time and part time employment than the nation as a whole and lower levels of unemployment, although this is increasing.

5.5 Transport

- 5.5.1 The level of car ownership in all wards is significantly higher than the national average. This is reflected strongly in the ward of Maulden and Houghton Conquest, where over 50% of households have two or more cars.

5.6 Housing

Housing Tenure

- 5.6.1 The percentage of people that own their home outright or with a mortgage is far higher than the national average in all of the wards, as well as being higher than Central Bedfordshire and Bedford administrative areas.

Housing Type

- 5.6.2 The predominant housing in the wards is either detached or semi-detached accommodation. All the wards have a low percentage of flats, maisonettes or apartments compared England as a whole, with Marston ward having the lowest percentage (1.7%).

5.7 Crime

- 5.7.1 All four wards are classified as amongst the 50% least deprived areas in the country with regards to crime, and can be categorised as not being subjected to poor health due to crime.

5.8 Community Infrastructure

Open/Green Space

- 5.8.1 The Application Site is located within the Forest of Marston Vale. One of 12 Community Forest projects in the UK, it is aimed at restoring the countryside following over a century of industrial development in the area. This community forest area covers 61 square miles between Bedford in the north and the M1 near Milton Keynes, in the south, 75% of which is used for agriculture, and is home to approximately 25,000 people.

- 5.8.2 The principal public open space is the Forest of Marston Vale Millennium Country Park, situated in close proximity to the Application Site. Covering approximately 1 mile², this is an important green space for local communities and the wider area. The park features lakes, wetlands, woodlands, leisure facilities, cycle paths, horse trails and walking routes attracts over 350,000 visitors each year⁷.

Industrial Heritage

- 5.8.3 The area surrounding the Application Site has been host to the former Stewartby brickworks (shown in Figure 5.1) over a period of many years and this activity has in the past provided employment for many residents. Whilst only four of its chimneys remain, the brickworks, and the strong recollection of its associated operational impact (sulphur dioxide emissions etc), inevitably influence perception of any future development in the area.

Figure 5.1 Stewartby Brickworks



Stewartby Brickworks prior to closure

5.9 Health of the Community

Self-rated Health

- 5.9.1 A higher proportion of local residents in the four wards consider their health as 'good' compared to the averages for England and, less notably, Central Bedfordshire and Bedford administrative areas. All four wards show a similar profile, including lower proportion of people in 'Not Good Health' or suffering limiting long term illness.

⁷ <http://www.marstonvale.org/countrypark/information.html>

Life expectancy

- 5.9.2 Both Central Bedfordshire and Bedford administrative areas have a significantly higher life expectancy for males than the national average, approximately 1 year longer. Similarly both administrative areas have an average female life expectancy of a few months longer than across England as a whole.

Key indicator Diseases and Behaviours

- 5.9.3 Both administrative areas experience significantly less deaths from smoking or incidents of drug misuse than England as a whole. However, incidence of smoking in pregnancy is much higher in both these areas than nationally.
- 5.9.4 Central Bedfordshire administrative area has a much lower level of life lost to coronary heart disease than Bedford administrative area; both are below the national level. Early deaths from cancer are also lower in these areas than across England as a whole

Road Traffic

- 5.9.5 Deaths and injuries as a result of road traffic activity are marginally higher than the national average in both Bedford and Central Bedfordshire administrative areas.

Mental Health

- 5.9.6 Both Bedford and Central Bedfordshire administrative areas have significantly lower proportions of the population claiming mental incapacity benefits than across England as a whole.

5.10 Healthcare Facilities

GP Access

- 5.10.1 Twenty seven GP practices are located in proximity to the Application Site (ie within 5 miles of Stewartby, the nearest significant settlement). All of these are currently accepting new patients.

Hospital facilities

- 5.10.2 Seventeen hospital facilities are located within 20 miles of the Stewartby. Of those, the Bedford Hospital South wing (4 miles), Milton Keynes Hospital (10 miles) and Luton and Dunstable Hospital (13 miles) all have NHS A&E departments on-site.

5.10.3 The Health Profiles for 2009 generated by the NHS for Bedford and Central Bedfordshire administrative areas are presented in Figure 5.2 and Figure 5.3. The red circles indicate the area is performing significantly worse than the England average, yellow indicates no significant difference and green indicates the area is performing significantly better. White circles are shown where no significance can be calculated.

Figure 5.2 Health Profile for Bedford Administrative Area

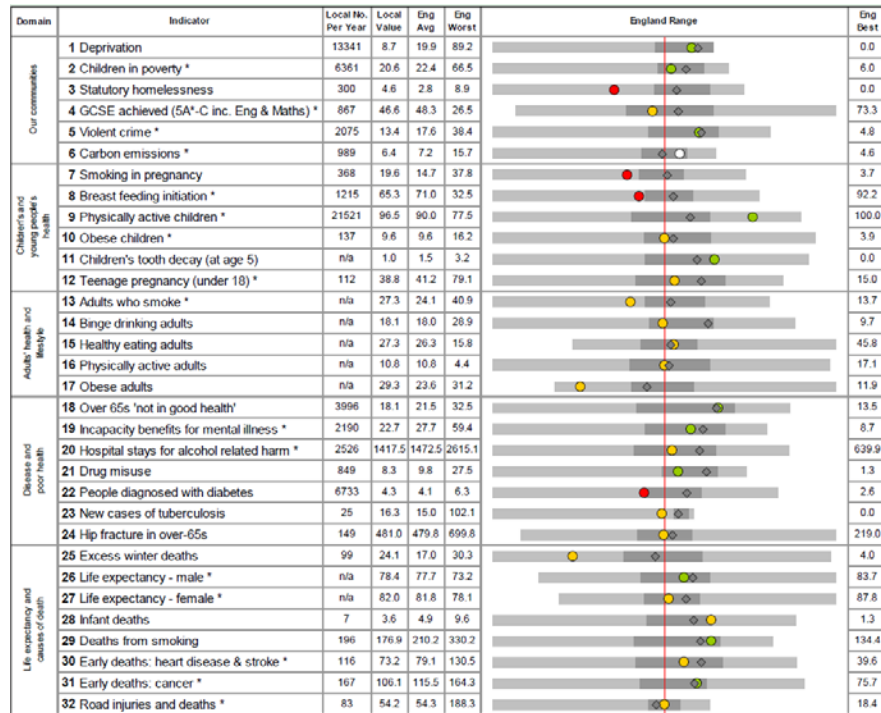
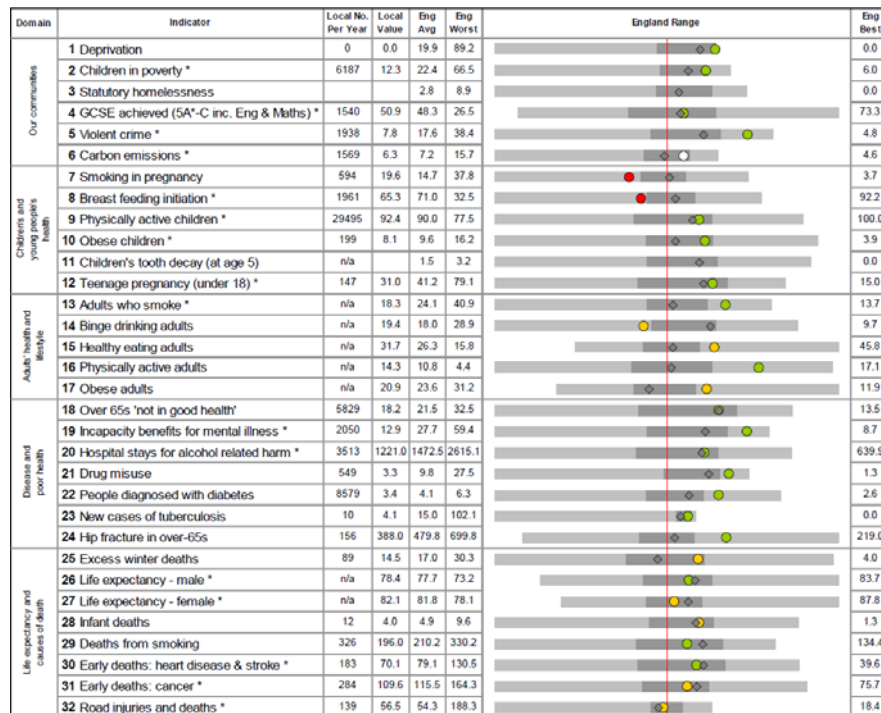


Figure 5.3 Health Profile for Central Bedfordshire Administrative Area



5.10.4 Based on these profiles, the health of the people close to the Application Site is similar to or better than that for England, although Central Bedfordshire administrative area performs better than Bedford administrative area overall.

6.0 Stakeholder Engagement

6.1 Introduction

- 6.1.1 The stakeholder engagement programme for this HIA was undertaken in May and June 2010. The stakeholder engagement programme for the HIA was designed to gather information on local sensitivities and identify potential health effects of the Project that would not be apparent from the published literature or using scientific research.
- 6.1.2 The word 'perceived' is sometimes used throughout this chapter to describe issues and concerns, as voiced by stakeholders in relation to the Project and potential future effects. It is not intended in any way to denigrate the legitimacy or value of stakeholder perspectives, but rather as a means of distinguishing between effects anticipated by stakeholders and those reported by the ES accompanying the DCO Application.
- 6.1.3 This chapter describes the nature and findings of the stakeholder engagement process undertaken for the HIA of the Project. The purpose of this chapter is to enable the reader to understand the stakeholder engagement programme, the analysis of the findings and their contribution to the wider HIA process. It is important to highlight that, in undertaking this engagement programme, the engagement team strove to retain the role of independent facilitator. ERM thanks all those who participated in the stakeholder engagement for the HIA.
- 6.1.4 Covanta has undertaken a wider programme of stakeholder engagement to support the Infrastructure Planning Committee (IPC) application starting in the summer of 2009. Covanta established a Community Liaison Panel (CLP) in September 2009 to provide representatives of local organisations and the community with a forum to find out more about the Project and to provide feedback on the issues most important to the local community.
- 6.1.5 The wider consultation included holding six exhibitions in July and August of 2009 and a further five interactive exhibitions in March 2010, which attracted over 550 local people to discover more about the proposals and to give their feedback.
- 6.1.6 The public exhibitions used materials such as exhibition boards and more interactive elements, including bottom ash samples, tutorials on how the proposed technology would work, a map presenting proposed traffic routes, feedback forms and a DVD with sections on Covanta's worldwide experience, the waste hierarchy and EfW and health issues.

6.1.7 During the wider programme of stakeholder engagement, Covanta received a request from NHS Bedfordshire and the Health Protection Agency (HPA) that a full Health Impact Assessment (HIA) is undertaken. Furthermore, a number of people wrote to Covanta or completed feedback forms outlining their concerns regarding the proposal's potential impacts on the health of the local community.

6.2 Objectives of the Process and Key Principles

Overview

6.2.1 The information that the engagement programme provides derives from stakeholders potentially affected by the Project. The programme asked stakeholders to consider and to comment upon the potential health effects related to the Project. In so doing, the engagement programme sought to capture a 'snapshot' of stakeholder opinion with which to inform the evidence base for the HIA.

6.2.2 The HIA stakeholder engagement did not set out to solicit the views of large numbers of people, but rather to talk interactively with a cross section of the community and stakeholders about potential health impacts. The primary mechanism for this interaction was a series of workshops. ERM's experience in HIA is that this format is the optimal one for gathering evidence of this highest quality. It is superior, for example, to a 'mailshot' questionnaire, in which the return rate is likely to be low.

Key Objectives

6.2.3 The key objectives of the HIA stakeholder engagement process were as follows:

- 1) to give voice to those whose health may be affected by the Project and to provide an opportunity for stakeholders to outline their opinions, views and concerns;
- 2) to ensure that potential health effects are identified and recorded which reflect local experience and knowledge that might not otherwise have been considered;
- 3) to ensure that local needs and considerations are taken into account in formulating recommendations;
- 4) to establish the transparency of the process; and
- 5) to manage expectations and perceptions regarding the stakeholder engagement programme and what the proposals can deliver.

6.3 Stakeholder Engagement Methodology

Stakeholder Mapping and Identification

6.3.1 Stakeholder mapping is a process that identifies the key stakeholders for any given project and provides the means by which they can be most appropriately engaged. This process provides a proactive approach to ensuring that all those who should be engaged or involved are considered. Recognising who should be considered enables suitable mechanisms for engagement to be selected and implemented.

Geographic Area of Engagement

6.3.2 The first step in stakeholder mapping was to establish the geographic boundaries of the engagement process. This was necessary to define the limits of engagement, whilst also ensuring the relevance of target engagement areas.

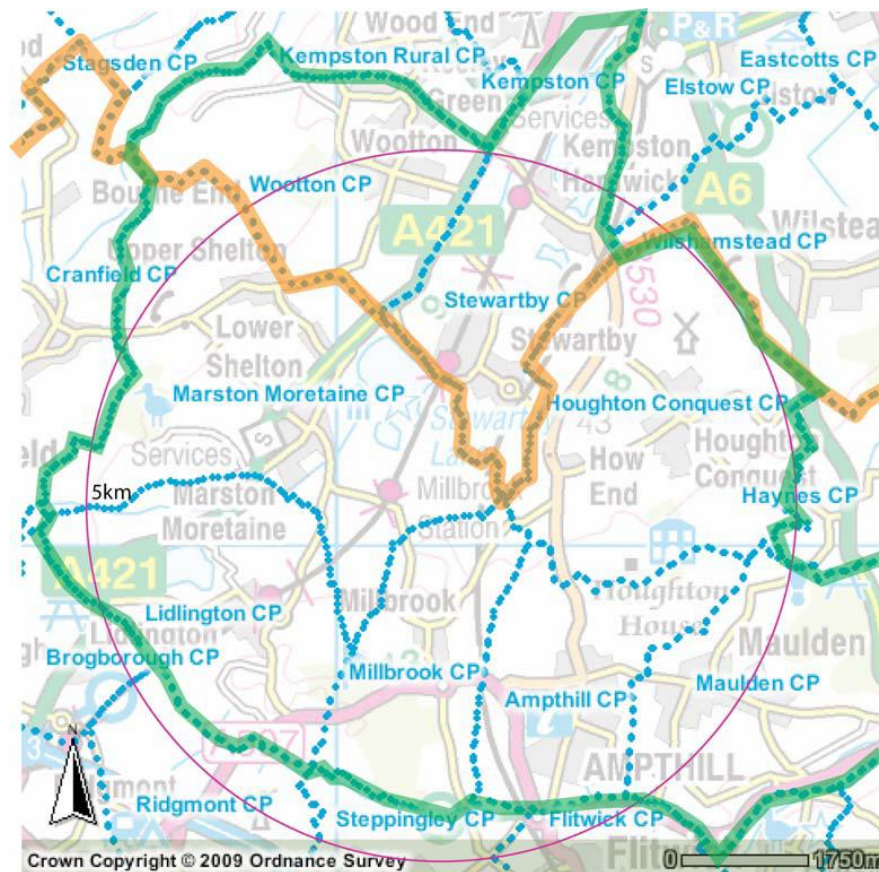
6.3.3 An engagement 'footprint' of 5km from the Application Site (see Figure 6.1), adjusted to reflect parish council boundaries, has been used for the wider stakeholder consultation activity and also the HIA stakeholder engagement. This footprint has been chosen to accommodate existing parish councils and to avoid splitting villages or local areas along artificial boundaries. The 5km footprint is also deemed to be appropriate in the context of near neighbour issues.

6.3.4 The choice of parish council divisions also relates to stakeholder engagement by ensuring that parish/ town councils, the lowest level of local representation, are consulted as a minimum.

6.3.5 The main focus was on the areas closest to the site, including the following communities:

- 1) Ampthill;
- 2) Houghton Conquest;
- 3) Lidlington
- 4) Marston Moretaine;
- 5) Millbrook;
- 6) Stewartby; and
- 7) Wootton.

6.3.6 These communities lie within the Central Bedfordshire Local Authority and Bedford Borough Council.

Figure 6.1 Engagement 'Footprint' of 5 km radius

Orange line = Central Bedfordshire and Bedford Borough boundary

Green Line = Consultation area along parish council boundaries

Identifying Stakeholders

6.3.7 The key stakeholder groups to be targeted for the engagement programme were identified. The list of stakeholders reflects those that may have an interest in the Project or in the general health of the population within the immediate area. The stakeholders identified include:

- 1) regional groups;
- 2) Central Bedfordshire Unitary Authority;
- 3) Bedfordshire Borough Council;
- 4) Bedfordshire PCT;
- 5) Community Liaison Panel (CLP) as established by Covanta and ran throughout the planning process;
- 6) head/ deputy head teachers;
- 7) GPs;
- 8) parish councillors;
- 9) local action group representatives;

- 10) local community group leaders or representatives (eg Women's Institute, youth groups); and
- 11) members of the community (in particular those who have expressed concerns around health issues at previous events).

Methods

Introduction

- 6.3.8 The stakeholder engagement aspect of the HIA invited named individuals and or groups to attend the workshops and to discuss the potential health impacts both positive and negative of the Project. Those invited were people who had previously expressed concern about health issues to maintain focus on health issues rather than the project in general. Key individuals who were unable to attend the events were invited to participate either in writing or through telephone interviews.
- 6.3.9 The approach to stakeholder engagement took into consideration the high level of consultation on the Project that had been undertaken prior to HIA stakeholder engagement and therefore the potential for consultation fatigue, the geographical distribution of the potentially affected population, the 'times' when different groups are most likely to attend meetings and the location of the Project.
- 6.3.10 The programme of stakeholder engagement was discussed and agreed with Bedfordshire PCT, prior to its initiation.

Stage One – Community Liaison Panel Meeting

- 6.3.11 A meeting was held with the Community Liaison Panel (CLP) to discuss and to explain the HIA process, who should be invited to attend HIA engagement events and to discuss potential health impacts as a result of the Project with this group.

Stage Two - 'Strategic Stakeholder' Event.

- 6.3.12 To inform the HIA, an event aimed at stakeholders such as local authority representatives, regional groups, the PCT, head/ deputy head teachers etc was held on 25th May at the Forest Centre in Marston Moretaine. The meeting was held during normal working hours (13.30 - 16.00).
- 6.3.13 People were invited to the event by invitation letter and asked to respond as to whether they or anyone else in their organisation would like to attend. Information about the Project and the HIA process was also included in the invitation letter that was sent to people.

- 6.3.14 It is recognised that it is difficult for head/deputy head teachers to leave school during normal office hours and for GPs to leave their surgeries during normal surgery hours for such events. Therefore, these groups were also invited, as an alternative, to attend the open community workshops.
- 6.3.15 At the 'strategic stakeholder' event participants were given a brief presentation about the Project, using supporting materials such as maps. An explanation of the HIA process and the reasons for ERM's presence was also given. Questions and answers were taken before open discussions with the group. All materials used during the meeting are presented in Annex C.
- 6.3.16 24 people were invited to the event, although only four people attended. Such levels of attendance are not unusual for such HIA events with professionals due to the many competing pressures on their time and the fact that HIA is not within their scope of work. Furthermore, due to the timing of the HIA stakeholder programme, it is possible that many individuals had taken the opportunity to express their concerns and views either in response to the PER or as part of the wider stakeholder engagement programme.

Stage Three - Community Based Events

- 6.3.17 Two open community based HIA events were organised and held on 5th June at Stewartby Village Hall (13.30- 16.00pm) and 8th June at the Forest Centre in Marston Moretaine (18.30 – 21.00pm).
- 6.3.18 As with the 'Strategic Stakeholder' event, people were invited to the event by invitation letter and asked to indicate if they planned to attend. Information about the Project and the HIA process was also included in the invitation letter. Contact details were sourced from records kept from the wider engagement process. Members of the CLP were also asked to invite additional people to the meetings if they felt this would be appropriate.
- 6.3.19 The community based events aimed to target parish councillors, local action group representatives, local community group leaders or representatives (eg Women's Institute, youth groups) and members of the community (in particular those who have expressed concerns around health issues at previous events).
- 6.3.20 As with the 'strategic stakeholder' event participants were given a brief presentation about the Project, using supporting material such as maps. An explanation of the HIA process and the reasons for ERM's presence was also given. Questions and answers were taken before open discussions with the group. All materials used during the meeting are presented in Annex C.

- 6.3.21 Ninety seven people were invited to the community based events. Fourteen people attended the event on 5th June in Stewartby and 22 attended on the 8th June at the Forest Centre.

Stage Four – Key Informant Interviews

- 6.3.22 Key informant interviews were attempted with individuals who were unable to attend the events listed above, but who the ERM team believed it was important to speak with. For example, local health practitioners were contacted separately by phone, but only one interview was possible. This was with a member of NHS Bedfordshire.

6.4 Key Issues and Impacts (From All Engagement Mechanisms)

Introduction

- 6.4.1 This Section collates the issues raised during the stakeholder engagement process and presents the views of stakeholders about anticipated effects. Notes and outputs from the individual health specific events can be found in Annex C.

Emissions and Air Quality

Issues

- 6.4.2 There is a lot of concern amongst stakeholders about emissions from the EfW Facility, such as nanoparticles and dioxins, along with a perception that the exact levels and types of pollutants which will come out of the stack are not fully understood by Covanta or specialists. Concerns around air quality, apart from emissions from the stack, mainly related to the emissions from increased vehicles associated with the Project.
- 6.4.3 **Emissions:** concerns over emissions of pollutants, including dioxins and particles, the distance these emissions will travel and emissions limits being exceeded.
- 6.4.4 **Traffic:** concern over an increase in HGV traffic, congestion and associated air pollution.
- 6.4.5 **Pollutants:** concern that pollutants coming from the EfW Facility will enter the food chain, as they fall on nearby fields, allotments and vegetable patches.
- 6.4.6 **Cumulative Emissions:** concern regarding the cumulative impact of developments in the area and their combined impact on emissions (eg the new A421).

Effects

- 6.4.7 There is anxiety over the perceived link between emissions from the EfW Facility and health impacts, such as increased levels of asthma, links with cancer and pollutants entering the food chain. There was also significant concern regarding accidents occurring at the site and the impacts these might have on local people's health – including a perceived danger from radioactive or otherwise hazardous material such as asbestos, being incinerated at the site.
- 6.4.8 It was reported at one workshop that, since the brick works in the area closed down, those people who suffered from asthma have had reduced symptoms and they are now concerned the proposed RRF will aggravate their asthma again.

Vulnerable groups

- 6.4.9 Stakeholder concerns in terms of health impacts associated with emissions were mainly in relation to the young and those with pre-existing respiratory conditions, such as asthma.

Road Traffic*Issues*

- 6.4.10 Concern was expressed by some stakeholders over the potential for increased road traffic on the new A421 as a result of large amounts of waste being transported by road.
- 6.4.11 **Road Capacity:** the new road infrastructure and its capacity to facilitate further traffic was an issue for stakeholders. People felt that the new A421 will be a busy road and not able to accommodate vehicles associated with the Project and that the increase in traffic on the A421 would lead to increased delays both on the A421 and other local roads.
- 6.4.12 **Road Safety:** stakeholders raised concerns over the potential for greater road accidents in the area as a result of increased traffic.
- 6.4.13 **Litter:** fears around increased littering in the area from additional lorries on the roads which was reported to happen when Brogborough Landfill was in operation.

Effects

- 6.4.14 Stakeholders felt that the perceived increase in congestion and littering by lorry drivers would cause annoyance. There was also some concern over the potential for increased accidents, especially for motorcyclists, horse-riders and pedestrians. Stakeholder concern was also expressed with regard to the perceived increase in vehicular noise events arising from the Project.

Vulnerable groups

- 6.4.15 Stakeholders identified motorcyclists and residents close to the A421 as being more vulnerable to road traffic accidents associated with higher vehicles movements on the A421 and local roads.

Noise*Issues*

- 6.4.16 Local people expressed concern over increased noise in the area as a result of traffic associated with the Project on the local road network. There was concern over the impact that this would have on the quality of life of residents in rural locations. It was also mentioned that noise levels in the area have dropped since the closure of the Brogborough Landfill and there is concern that noise levels will increase again when the Project is operational.

Effects

- 6.4.17 It was reported that concern over perceived increases in noise levels will impact the quality of life of local residents, their sense of well-being and stress levels.
- 6.4.18 Concern was also expressed regarding increased noise from HGV movements in the early hours of the morning and in the late evening, resulting in sleep disturbance and annoyance.

Vulnerable groups

- 6.4.19 No specific vulnerable groups were identified in relation to noise impacts by stakeholders, although it was recognised that this would mainly be an issue for residents living in more rural locations or close to the road network, particularly those properties near the existing A421.

Visual Environment*Issue*

- 6.4.20 Concern was expressed by some stakeholders over the negative effect the Project would have on the visual environment. People felt that the design of the building is ugly and would detract from the area. Some stakeholders were particularly concerned about the cumulative visual impact if other developments in the area got planning permission, such as a proposed wind farm.

Effect

- 6.4.21 Any deterioration in the visual environment was considered by stakeholders to have a negative impact on quality of life and satisfaction with the area they live. In addition, it was thought that the presence of the site alone would cause anxiety which may enhance perceived negative health impacts.

Vulnerable groups

- 6.4.22 No specific vulnerable groups were identified in relation to visual intrusion by stakeholders, although it was recognised that any impacts would be felt more strongly by those residents living in locations where the site is particularly visible.

Green Space and Recreation*Issue*

- 6.4.23 Concern was expressed that the presence of the Project would inhibit the use of green space for recreational purposes, such as the Forest Centre. In addition, there is a fear that tourists coming to the area to use green space will be negatively impacted.
- 6.4.24 Visual intrusion as a result of the scale of the building was also mentioned as a potential key contributor to decreasing the value of green space, along with fears about emissions.

Effect

- 6.4.25 Some participants were concerned that people discouraged from using the green space close to the site would result in a decrease in the quality of life for those individuals.

Vulnerable Groups

- 6.4.26 No specific vulnerable groups were identified in relation to green space.

Employment*Issues*

- 6.4.27 **Employment opportunities:** construction of the Project will create employment (as would later phases of the Project) and there will also be some secondary employment in the area as a result of services and procurement of goods.

- 6.4.28 **Migrant Labour:** stakeholders were not concerned about the potential influx of workers into the area as there is already a construction workforce associated with building the new A421 present in the area, which has not caused any problems. It was felt that the workforce would be so small it would not be noticed by local people.
- 6.4.29 **Local Employment:** jobs are perceived to be either manual labour or specialist jobs and therefore would not go to local people. However, stakeholders indicated that many people in the area commute to work (in London), as there are few jobs in the local area and, as such, they were not concerned about getting local jobs.

Effects

- 6.4.30 Participants felt that any benefits from employment for local people would be minimal, as local residents would not be interested in the jobs available and the numbers involved were too small. Stakeholders were more concerned about health and safety standards for employees working at the proposed RRF due to articles they had read on the internet regarding Covanta's health and safety record, mainly in The United States of America.

Vulnerable group

- 6.4.31 No specific vulnerable groups were identified in relation to employment, due to the fact there are high employment levels in the area.

Trust

Issue

- 6.4.32 One of the main issues raised by stakeholders throughout all the events held was their lack of trust both in Covanta and the Environment Agency (EA).
- 6.4.33 Reported reasons for the lack of trust in Covanta include the perceived poor health and safety records in their facilities in USA and breaches of emission standards there. These perceptions have developed by local residents doing extensive internet searches on Covanta company history and management of incinerators.
- 6.4.34 In addition, stakeholders were concerned that in the future the composition of waste that will be burnt in the RRF will change (in particular to include hazardous and/or medical waste).

- 6.4.35 The lack of trust in the EA is primarily based on local experiences from when the brick works and Brogborough Landfill were both operational. It was reported that emissions limits at the brick works were regularly breached, resulting in its eventual closure by the EA and that Brogborough Landfill operated for longer than its original permit allowed with the tacit approval of the EA.
- 6.4.36 Stakeholders are concerned that the EA will not monitor emissions sufficiently and that they will not be monitoring all pollutants, just those specified by the legislation. They are also concerned that the EA will not enforce or remove licences if air quality emissions limits are breached. There is also local perception that Covanta will become friendly with the EA and will therefore be allowed to breach air quality limits.
- 6.4.37 Finally, there is overall mistrust in the current understanding of the science of how emissions will affect the health of residents. Stakeholders feel that in 10 years time there will be a greater understanding of the types of emissions that will be produced from the RRF and a better understanding of the health impacts associated with these. Therefore, stakeholders are concerned that the local community are being put at risk.

Effect

- 6.4.38 Stakeholders feel their lack of trust in both Covanta and the EA will affect their wellbeing and in particular the mental health of the local population.

Further Issues

- 6.4.39 Other key issues mentioned in the engagement workshops include the following topics:
- 1) concern over increased stress for residents as they will not be able to sell their homes due to the proximity to the Project and the public fear of emissions;
 - 2) perceived odour issues from the RRF;
 - 3) potential impacts to health associated with the fly ash produced by the EfW Facility and the perception this may be toxic or even radioactive and that the transport of this ash may not be safe;
 - 4) the feeling that waste should be disposed of as close to where it is produced as possible; stakeholders expressed dissatisfaction that the Project is being built to deal with waste from other counties;
 - 5) concern that people will develop mental and physiological health impacts as a consequence of the stress induced by the presence of the Project;

- 6) concern that as people recycle more there will not be enough waste from Buckinghamshire to keep the RRF operational and waste will be trucked in from further afield, or other types of waste will be burnt;
- 7) the feeling that the community fund is a 'bribe' and 10% cheaper electricity that is being offered to some residents is an 'insult'; and
- 8) people will no longer use the Forest Centre as they are considered as being in Covanta's 'pockets'. One participant reported that their voluntary services had been withdrawn from the Forest Centre because of the proposal.

6.5 Underlying Issues

- 6.5.1 A sub-set of issues underlies the direct issues and concerns raised during the HIA engagement process; these centre on factors which heighten concern and anxiety amongst stakeholders, leading to a negative effect upon health.
- 6.5.2 This subset comprises issues implicitly or explicitly raised during the engagement programme. In highlighting these issues, it is recognised that, whilst these may be underlying factors which influence stakeholder perception, they are nonetheless both relevant and important to the consideration of effects, with respect to stakeholder opinion.
- 6.5.3 It is clear from the stakeholder input to this programme that the majority of participants who participated are against the Project. The main major negative health concerns focussed on increased stress levels associated with the proposed RRF being located close to them and the fear of the health impacts associated with emissions. However, there are a wider set of issues that would also appear to be important and contribute to the negative attitude of stakeholders to the proposals, including:
 - 1) the perception that the project will not provide any benefits for the local community, whereas the previous industrial activities in the area, such as the brick works in Stewartby, served a social purpose;
 - 2) knowledge and experience of previous industries in the area, such as the brick works and landfill sites, and the perceived negative impact these had on the area, people's well being and quality of life; and
 - 3) the area being seen as a 'dumping ground' for other counties' waste.

6.6 Stakeholder Recommendations

Introduction

- 6.6.1 The following section outlines suggested recommendations focussing on issues raised explicitly and implicitly by stakeholders during the engagement programme and more broadly the process of stakeholder engagement per se.
- 6.6.2 The number of recommendations is limited reflecting the fact the participants felt many of the impacts could not be mitigated successfully or meaningfully and the expressed opposition to the Project as a whole. The recommendations are presented in Table 6.9.

Table 6.9 Stakeholder Recommendations

Determinant	Stakeholder Recommendations – Arising from Engagement Programme
Air Quality and Emissions	The emissions monitoring data that Covanta submit to the Environment Agency (EA) should also be publicly available.
	Covanta needs to find a way of proving emissions are not harmful to the public.
	Emissions data could be available in the visitors centre to help to increase trust of Covanta.
	Ongoing investment by Covanta in technology to lower emissions.
	Monitoring measures put in place to detect metals and radioactive material.
	Real time emissions data published on the web.
Visual	The RRF could be designed to be more attractive and 'cutting edge', eg a grassed roof.
	The RRF could be 25% of the proposed size.
Road Traffic	Rail or barges should be used to bring in waste in instead of using lorries.
	A code of conduct for lorry drivers could be enforced, eg lorries not being allowed to enter the site before 7am.
	Sealable trucks should do round trips, bringing in waste and taking away fly ash, to reduce HGV numbers.

Determinant	Stakeholder Recommendations – Arising from Engagement Programme
Other	The visitor centre should be open for school trips and other interested groups so they are able to learn about what happens at the RRF.
	The visitor centre could be used like the Forest Centre as a community facility and hold functions etc.
	Funding by Covanta for medical research into the health impacts on the local communities.
	Communication of a 'disaster' management plan.
	A swimming pool for the community could be provided by Covanta which is heated by waste energy produced.
	The community fund should be £50 million pounds to ensure the community does benefit.

6.6.3 These recommendations originate from the stakeholder engagement process and are considered further within the context of the wider HIA assessment. The recommendations of the HIA assessment are presented in Section 9.

6.7 Informing the HIA

Introduction

6.7.1 The stakeholder engagement programme was undertaken with the primary objective of informing the HIA and, specifically, contributing to the evidence base used for the assessment. Therefore, it incorporates stakeholder views in the assessment. The methods employed sought to provide a direct means of engagement and effective capacity to capture the perspectives of the local stakeholders.

Using the Evidence Base

6.7.2 The stakeholder engagement programme aimed to elicit specific opinions and to explore the reasons why participants hold these opinions.

6.7.3 The information derived from the programme and the analysis of this information is primarily qualitative in nature, in that it is not reducible to numbers and it is indicative of, rather than representative of the views held by the community as a whole and all stakeholders.

- 6.7.4 It should also be noted that no random sampling mechanism was used to identify members of the local communities and stakeholders and therefore participants in this process, in particular the open community sessions, were self selected.
- 6.7.5 Stakeholder opinions expressed are taken forward into the assessment phase for consideration alongside the findings of the EIA and the evidence from the community profile and the literature review.

7.0 Literature Review

7.1 Introduction

7.1.1 This section summarises the information contained within the literature review, which forms the evidence base for research relating to changes in health determinants and consequent health effects. Further detail and complete references for all information can be found in Annex A.

7.1.2 Evidence of how health can be impacted by different determinants and pathways is described below under the following headings:

- 1) air quality;
- 2) incineration and public health;
- 3) transport;
- 4) noise;
- 5) visual environment;
- 6) employment and socioeconomics; and
- 7) social capital.

7.2 Air Quality

7.2.1 Exposure to outdoor air pollution is associated with both acute and chronic health affects. Particulate matter (PM), mainly generated from engine emissions and construction activities, can adversely affect human health in varying degrees depending on its size, composition, origin and the length of exposure. The public health implications of the long-term effects of exposure to PM are an order of magnitude greater than those of the short-term effects, as measured by life years lost, although it is difficult to disentangle the two entirely. A strong body of epidemiological evidence provides compelling evidence of the association between long-term exposure to PM_{2.5} and cardiovascular disease, with consequent implications for mortality. The RRF will emit a quantity of particles and these will tend to be mostly in the size range 0.5 – 3µm.

7.2.2 Exposure to nitrogen dioxide (NO₂) and PM₁₀ at sufficiently high concentrations causes inflammation to airways and long term exposure can increase the probability of respiratory symptoms and problems with lung function in some people.

7.2.3 Groups that are particularly vulnerable to exposure from air pollution include foetuses, young children, the elderly and those with cardio-respiratory disease, as well as the social-economically deprived.

- 7.2.4 Dust emissions and subsequent deposition arising from construction activities can cause annoyance. Dust can also irritate the eyes and aggravate pre-existing respiratory problems, such as asthma.

7.3 Incineration and Public Health

- 7.3.1 A great many studies have sought to investigate a variety of diseases in populations around waste incinerators. None have convincingly been able to detect any such influence, although some of the earlier studies on very old and badly performing incinerators can be interpreted as showing an effect, if a partial view of the results is taken.
- 7.3.2 Measurements of dioxin concentrations in the environment around waste incinerators that are performing to current EU emission standards are unable to distinguish any influence from the incinerators, as compared with control populations. Such studies have examined the presence of dioxins and similar 'marker' substances in soils and also the blood of people in exposed populations in order to reach the conclusion that there is no effect of incineration.
- 7.3.3 Any health effects from exposure to persistent pollutants, such as dioxins, would be through prolonged exposure and manifest themselves as chronic effects. Some of the substances are carcinogens and a fear commonly expressed is that the incidence of cancer will increase. No statistically significant increase in any particular type of cancer has been identified in studies to date.
- 7.3.4 A dominant concern and anxiety within host communities where a new EfW plant is proposed relates to the emissions to atmosphere of a number of substances, one of which is very fine particles. There is nothing unique about particles generated by incineration relative to other combustion processes and every reason to suppose that the effect of such particles on human health at the population level is entirely similar to that observed in the large scale epidemiological studies. Studies that examine particles and incineration specifically cannot be undertaken, as there are too many other sources of particles in the atmosphere.

7.4 Transport

- 7.4.1 Transport plays a vital role in promoting health and well being. It does this directly by providing communities with access to a range of services and amenities required to treat ill-health and to manage and promote healthy living. It does so indirectly through achieving and maintaining social and family networks and accessing employment opportunities.

7.4.2 Transport can have a negative impact on health due to injuries and death through accidents. In addition, transport can lead to increased noise and air pollution resulting in respiratory and cardiovascular problems. Congestion constrains movement and leads to increased stress and frustration, and aggression, which in turn can lead to increased likelihood of a crash or accident⁸. Traffic noise can also cause nervousness, depression, sleeplessness and irritability.

7.5 Noise

7.5.1 Noise has the potential to affect health in a variety of ways. Some effects can be auditory (damage to the ear) and occur as a direct impact of noise (at levels higher than considered here and in excess of statutory acoustic limiting values) whilst others are non auditory; such as annoyance, night time effects and mental health impacts and may be associated with exposure to environmental noise.

7.5.2 Annoyance is the most reported non auditory health effect associated with noise. Vibration can also cause annoyance to those experiencing it. Sleep disturbance associated with noise is also a major issue with certain vulnerable groups more likely to be affected. It has been shown that noise levels that are sufficiently high can induce cardiovascular effects at the population level, including acute myocardial infarction.

7.6 Visual Environment

7.6.1 People attach considerable importance to the quality of their surroundings and the prosperity of an area can be influenced to a considerable degree by its image. The visual presence of an industry is also linked to the level of risk that people perceive and such disturbances can become a focus for concern and anxiety.

7.6.2 The built environment can impact on public health and the way that people use their environment, influencing physical activity and the health impacts associated with this. The natural environment is known to have a restorative function in that it reduces stress and anxiety levels. There is a strong link between the visual environment and people's mental and physical health.

8 World Health Organization. (2000) Transport, environment and health. WHO Regional Publications, European Series. No.89

7.7 Employment and Socioeconomics

- 7.7.1 Employment and income are regarded as the key determinants of health, influencing where an individual lives, the education received, access to healthcare and even lifestyle and behaviour.
- 7.7.2 Ethnic minorities, young people and the disabled generally face the highest levels of unemployment. These groups are likely to be found in more insecure employment and be poorly paid, therefore having low socio economic status.
- 7.7.3 Unemployment is directly linked with poorer health (and vice versa). Unemployed individuals are more likely to report illness and injury as well as psychological symptoms such as demoralisation. Health outcomes associated with unemployment include physical health effects, mental health effects, suicide, well being, role functioning, poor self reported health and increased mortality.
- 7.7.4 Increased employment opportunities can have a positive influence on health through increasing social contact, involvement in a collective effort or activity and by forming social relationships. All of these contribute to well being. In addition, those in insecure employment are likely to have poorer mental health than those in secure employment.
- 7.7.5 Employment and income together contribute to a person's socio economic status. In broad terms, the greater the income, the better the health. However, this relationship is not strictly linear. Above a certain amount, higher income is less proportionally related to improved health across a population.
- 7.7.6 The issue of house prices was raised during the stakeholder engagement workshops. The evidence base for this topic is not extensive and consists of one research study in Massachusetts, some work done by Defra on the related issue of landfill and several submissions to planning inquiries. This body of work is also discussed at length in the Economic Statement accompanying the DCO Application.
- 7.7.7 The value of a house is determined by its characteristics, including the area in which it is sited. How pleasant a place is to live in should therefore be reflected in the prices of houses in that place. If undesirable facilities are located nearby, it would be expected that this might be reflected in the price of houses close to those facilities. Any reductions in house prices would indicate that an area has become a less desirable place to live. The main effect of reductions in house prices is a loss of equity for existing owners, although there could be accompanying emotional feelings.

7.7.8 The very limited evidence from the US study would suggest that EfW proposals could affect house prices and this has plausibility, but there is no evidence for causality and this narrow evidence base should be used to draw conclusions with caution. Indeed, this evidence is contradicted by the evidence gathered to support the application for an EfW facility in Newhaven, in which actual prices within a mile of the proposal site were shown to have increased in line with the wider market.

7.8 Social Capital

7.8.1 The current body of research tentatively suggests that there is a link between social capital and health both physical and mental health. However, the existence of a causal relation between enhancement or erosion of social capital and health outcomes is contested, and there is no consensus that particular social capital indicators can be linked to particular health outcomes.

8.0 Impact Assessment

8.1 Air Quality

- 1) **Health Pathway:** inhalation and ingestion of airborne pollutants
- 2) **Health Determinant:** physical environment
- 3) **Receptors:** local residents
- 4) **Vulnerable Groups:** the elderly, children

Baseline Summary

- 8.1.1 The existing air quality in the vicinity of Rookery Pit and in mid Bedfordshire generally is good by reference to air quality standards and air quality in the rest of the UK. For example, the ES reports that long term average concentrations of PM₁₀ are 15µg m⁻³ or less, whereas the relevant air quality standard is 40µg m⁻³.
- 8.1.2 Air quality in the area was not so good when the brick works were operating and the landfills were responsible for causing considerable odour nuisance. The brickworks at Stewartby were responsible for emitting in excess of 3,000 tonnes of SO₂ annually. Not only did the emission of SO₂ in this quantity constitute an air quality management problem in terms of compliance with the short term air quality standard, but it contributed in no small way to the odour nuisance experienced by local residents.
- 8.1.3 It is evident from listening to members of the local community describing their experience of the brick works' impact on local air quality that their expectation of future air quality with the EfW Facility in operation is strongly influenced by this experience.

Potential Impacts during Construction and Operation

Construction

- 8.1.4 Construction will have minimal impact on local air quality and can be neglected as a source of health impacts as a consequence of emission to atmosphere. The only potential pathways are construction dust causing nuisance and emissions from construction vehicles. The impacts of both of these are not significant in the context of either air quality or health effects.

Operational Aspects for Consideration

- 8.1.5 In the event of the Project becoming operational, there are potentially three aspects that require examination in the context of human health, as follows:

- 1) emissions from the chimney stack;
- 2) emissions from the vehicles entering and leaving the RRF; and
- 3) the handling and treatment of ash.

8.1.6 These are considered below in reverse order.

Residual Ash Treatment and Disposal

- 8.1.7 This aspect of the EfW Facility's operations is the cause of some anxiety for the participants in the open community workshops. The knowledge that some ash contains substances that can be described as toxic leads some people immediately to the view that that there is a risk to health. In fact, the handling and treatment of ash is such that human exposure to this material is so limited as to be effectively zero.
- 8.1.8 There are two types of ash to consider. Firstly, there is the Incinerator Bottom Ash (IBA) that is the direct residue left in the furnace following combustion. This constitutes approximately 25% of the original mass of the incoming waste, with 5% of this being in the form of metals. Secondly, approximately 5% of the incoming waste will be left as 'fly ash' - a residue after flue gas treatment, ie as a consequence of the filtration of flue gases to remove almost all of the particulate matter.
- 8.1.9 Bottom ash is not considered to be a hazardous material, for human health, and can be used safely as aggregate material in construction, eg road building. Thus, there is some potential human exposure to the material through its end use. However, there are no health implications, since the ash contains substances such as metals in relatively low concentrations and any such substances are not released to atmosphere or water for human exposure via inhalation or ingestion.

- 8.1.10 The fly ash contains metals at higher concentrations than the IBA, plus dioxins which form in the flue gases post combustion. Consequently, the fly ash is classified by the Environment Agency as hazardous and is ultimately disposed of in a landfill licensed for this purpose. For the fly ash to cause a health effect for members of the public, there must be a mechanism for human exposure over a prolonged period. The substances in the ash that could be regarded as hazardous would cause harm if ingested or inhaled over a long period (measured in years) in sufficiently large doses. For this to occur, there has to be a realistic pathway that links the source (the fly ash) and a receptor (a member of the public). The procedures for handling the fly ash are such that it is stored initially in a silo and then removed from Rookery Pit in a sealed container for transport to the landfill site. At no point in this process is the ash able to escape to the environment and so the exposure of the public to the potentially harmful substances it contains is zero.
- 8.1.11 During the stakeholder engagement workshops, the question was raised as to what would happen if there was a road traffic accident involving a container and some of the fly ash was able to escape from the sealed container as a result. In terms of human health, such a scenario is not of concern. This is because there is still no plausible pathway for inhalation or ingestion of the fly ash or the metals it contains. The material would have to have a means of entering the food chain, thereby providing long term exposure to humans through uptake into plants and animals consumed for food. Even if such a scenario were possible, the additional dose of metals ingested by a member of the public would be negligible in the context of total exposure through the normal diet.

Road Traffic Emissions

- 8.1.12 Operation of the RRF would result in 171 HGV leaving or entering the site daily, along with a smaller number of cars and light goods vehicles. These vehicle movements would result in some emission to atmosphere, affecting air quality alongside roads used for access. The most notable of these is Green Lane, along which the vehicles would have to travel from the A421 to the operations area.
- 8.1.13 In terms of the total mass of pollutants released to atmosphere, these vehicles account for a very small fraction of the total emissions. However, the release is at ground level and so the potential exists for an air quality impact at the roadside and for any residents in close proximity to the roads. The ES has provided a prediction of the air quality impacts for the roadside at Green Lane. This point represents the location most affected by the vehicle emissions. At the roadside along the existing A421, an increase in concentrations would be lower, as the additional traffic flow diverges at this junction. At locations further away from the roadside, the additional concentrations diminish rapidly with distance from the road.

8.1.14 The ES predicts the additional concentrations for NO_x and PM₁₀, the pollutants most identified with vehicle emissions. Relative to the case of there being no development, operation of the whole facility would result in an increase of approximately 1.5µgm⁻³ of NO_x and 0.5µgm⁻³ PM₁₀ as annual average concentrations along Green Lane at the roadside. These are small increases in the context of human health and especially so in this case for actual human exposure. The increases will be substantially lower at the properties in the vicinity of the existing A421 and there will be negligible health effects as a consequence. Beyond 150 - 200m from the road, the vehicle emissions will have no discernible influence relative to the background concentrations.

Emissions from the EfW Facility's Stack

8.1.15 This is undoubtedly the most prominent issue that concerned the participants attending the engagement workshops. In part, this concern is heightened by the experiences of the brick works' emissions.

8.1.16 The ES has reported in quantitative terms the air quality impacts and also contains a quantitative assessment of health outcomes for the exposure to additional concentrations of PM_{2.5}, PM₁₀, NO₂ and SO₂. In addition, there is a risk assessment of the additional exposure to metals and dioxins for a number of hypothetical receptors in the vicinity. Therefore, this particular impact on health is one that is well defined and, in comparison with many of the other pathways considered in the appraisal, relatively free from uncertainty.

8.1.17 The assessment presented in the ES (Technical Appendix 8.3) for the effects of the additional exposure to NO₂, PM_{2.5}, PM₁₀ and SO₂ considers a number of associated health outcomes for which there are established exposure-response relationships. These relationships have been derived from epidemiological studies conducted at the population level and have been widely used to quantify effects of air pollution. Whilst some caution must be exercised in applying the results of studies that have examined the effects of air pollution deriving from multiple sources to a single source, the evidence for the effects on health outcomes for specific pollutants is compelling and there is a high degree of confidence in the quantification, at least to within an order of magnitude.

8.1.18 The results of the assessment can be summarised as follows in Tables 8.1-8.3, with the exception of mortality resulting from PM_{2.5}, which is dealt with separately. The health outcomes referred to are the classifications used by the NHS and for which there are accessible data on background rates. These estimated outcomes apply to the exposed population, which is approximately 26,000.

Table 8.1 Health Effects of Additional Exposure to PM₁₀.

Disease State	Extra Cases per annum	Extra Cases in 30 year period	Years of operation needed for one case
Chronic Bronchitis	0.0074	0.2222	135
Cardiovascular Hospital Admissions	0.0011	0.0333	900
Respiratory Hospital Admissions	0.0012	0.0353	850
GP Consultation Asthma	0.0212	0.6363	47
LRS Children	0.0002	0.0052	5815
LRS Adults	0.0005	0.0138	2175

Note: LRS = Lower Respiratory System

Table 8.2 Health Effects of Additional Exposure to NO₂

Disease State	Extra Cases per annum	Extra Cases in 30 year period	Years of operation needed for one case
Cardiovascular Hospital admissions	0.0588	1.7639	17
Respiratory hospital admissions	0.0096	0.2873	104
Deaths (non traumatic) brought forward	0.0087	0.2609	115

Table 8.3 Health Effects of Additional Exposure to SO₂

Disease State	Extra Cases per annum	Extra Cases in 30 year period	Years of operation needed for one case
Respiratory Hospital Admissions	0.0019	0.0577	520
Deaths (non traumatic)	0.0016	0.0487	615

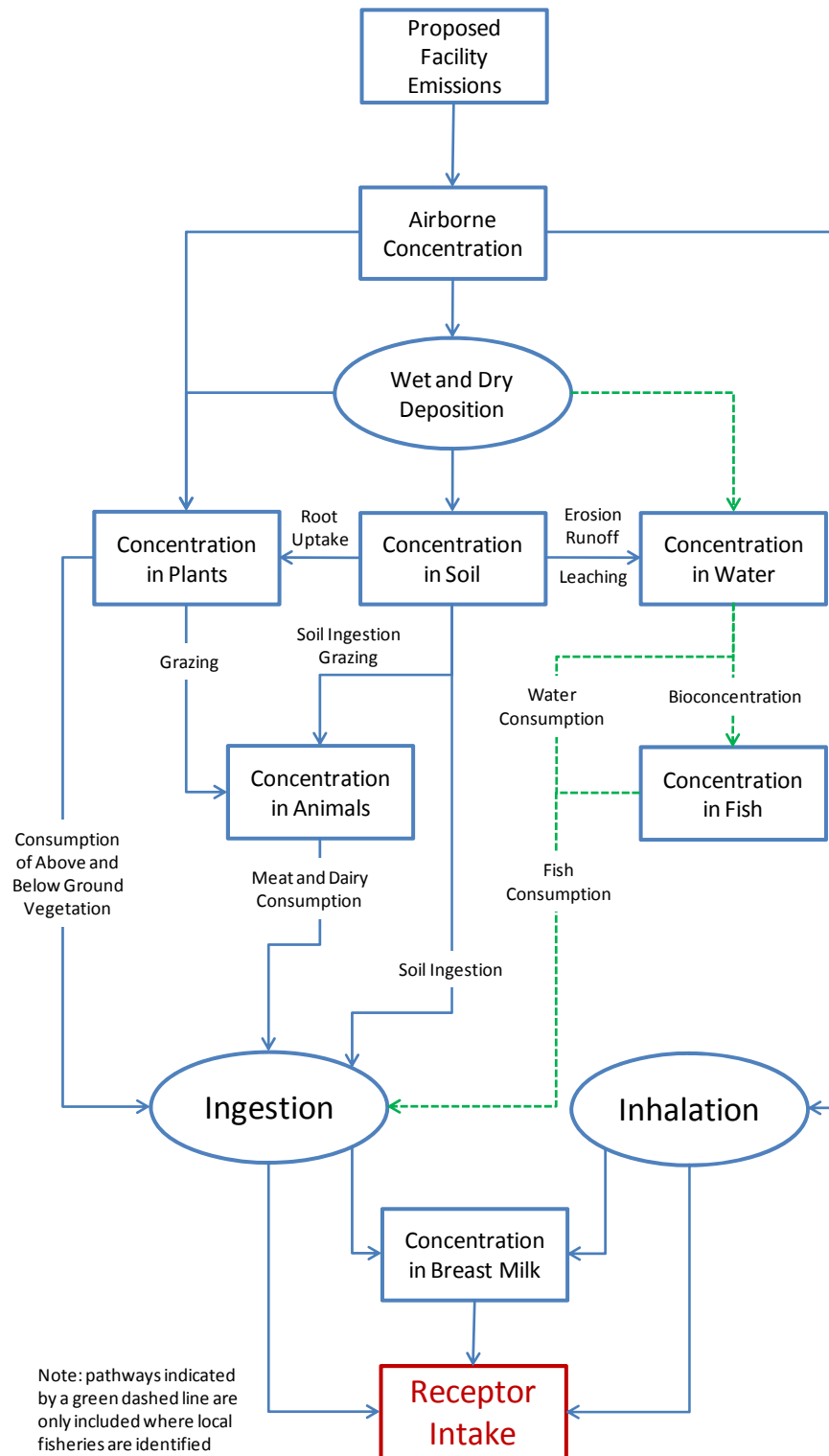
8.1.19 The obvious conclusion that can be drawn from these estimates is that they are extremely small, both in absolute terms and in comparison with existing rates. For comparison, the national background rates for these outcomes are presented below in Table 8.4. Note that these are expressed in terms of every 1000 people, whereas the estimated additional outcomes presented in Tables 8.1-8.3 are for the population of 26,000.

Table 8.4 Background Rates for Selected Health Outcomes

Disease	Rate per 1,000 population
Chronic Bronchitis	8
Cardiovascular Hospital Admissions	14
Respiratory Hospital Admissions	7.8
GP Consultation Asthma	64.13
LRS Children	325
LRS Adults	204.44
Mortality - Deaths (non traumatic) brought forward	7.69
Life expectancy (Men)	76.55 years
Life expectancy (Women)	80.91 years

- 8.1.20 The calculation of the loss of life years through exposure to additional concentrations of PM_{2.5} is 0.62 years distributed across the population of 26,000. If this distribution was an even one, this translates as 12 minutes per person. This loss of life years should be seen in the context of the 8-10 months of life years considered to be lost for people in this part of England through exposure to PM_{2.5} and against the changes in life expectancy observed over a long period of time.
- 8.1.21 The evaluation of exposure to persistent pollutants such as metals and dioxins has been carried out by the application of the US Environmental Protection Agency's (US EPA) Human Health Risk Assessment protocol, in the form of commercially available software coding (the Industrial Risk Assessment Program (IRAP)).
- 8.1.22 The various pathways considered in the model are shown in Figure 8.1. These are mostly concerned with the transfer of the pollutant through the food chain, ie from uptake in the soil through plants and animals to the human body. Because the interest lies in the effects of long term exposure, the model considers the effects over a lifetime (taken as 70 years).
- 8.1.23 The model is applied for the case of a number of receptors in the nearby villages and also a hypothetical farmer who might consume a higher proportion of locally grown foods.

Figure 8.1 Exposure Pathways considered in IRAP



8.1.24 The risk assessment for metals and dioxins is comprehensive and the results are not reproduced here. Technical Appendix 8.3 of the ES should be consulted for the complete assessment. An example of the estimated risk is given in Table 8.5, which presents the total risk posed by the additional exposure to carcinogenic metals and dioxins by pathway.

Table 8.5 Lifetime Risk of Contracting Cancer by Exposure Pathway

Pathway	Lifetime Risk for an adult Farmer	Lifetime Risk for an Adult Resident of Stewartby
Inhalation	0.47×10^{-6}	0.24×10^{-6}
Ingestion of above ground vegetation	0.79×10^{-6}	0.26×10^{-6}
Ingestion of beef	0.44×10^{-6}	0
Ingestion of chicken	$0.00003.0 \times 10^{-6}$	0
Ingestion of drinking water	0.0079×10^{-6}	0.0059×10^{-6}
Ingestion of eggs	0.000019×10^{-6}	0
Ingestion of fish	0	0
Ingestion of milk	0.29×10^{-6}	0
Ingestion of pork	0.0015×10^{-6}	0
Ingestion of soil	$0.0001.4 \times 10^{-6}$	$0.00006.5 \times 10^{-6}$
Total Lifetime Risk	2.0×10^{-6} (1 in 500,000)	0.5×10^{-6} (1 in 2,000,00)

8.1.25 The resident of Stewartby, in this scenario, is not considered to be exposed other than by inhalation, drinking water, accidental ingestion of soil and through growing vegetables in a garden or allotment. The hypothetical farmer, on the other hand, consumes animals raised locally. Consequently, the farmer has a higher risk of contracting cancer, entirely through the ingestion pathway.

8.1.26 However, the absolute values of risk are extremely small. These are lifetime risks and are substantially below those that are taken to be 'tolerable' in planning and for granting permits. An annual risk of 1 in 1,000,000 is often taken as a measure of 'tolerability' (equal to 1 in 14,300 when expressed as a lifetime risk).

8.1.27 These risks are given for the receptors for which the calculation produced the greatest risk. All other receptors, ie in other villages or at locations further way, have an even smaller risk of contracting cancer.

8.1.28 The assessment also considered the additional body burden of dioxins for the hypothetical receptors and showed that the additional intake of dioxin over a lifetime is very small. For a resident of Stewartby, the additional intake is about 0.2% of the existing dietary intake, whereas for a farmer it could be 10%, depending on the assumptions regarding diet and food source.

8.2 Noise

- 1) **Health Pathway:** annoyance, sleep disturbance and wellbeing.
- 2) **Health Determinant:** physical environment
- 3) **Receptors:** road side residents, Stewartby residents
- 4) **Vulnerable Groups:** older people.

Baseline

8.2.1 Ambient noise levels in the area are generally quite low reflecting the rural nature of the area. Noise levels are influenced by the existing road network and the activities of residents of the area.

Construction

8.2.2 During construction phase of the Project significant noise impacts are not expected to occur. The noisiest activities will be the piling phase of the project. However, this is expected to be below the levels that would result in a significant effect at the nearest houses. The other activity that would result in some short term noise is the construction of the access road to the RRF closest to Stewartby, although again this is not expected to result in significant noise impacts. Both activities are also only expected to be short term activities.

8.2.3 Furthermore, noise will be mitigated by the construction methods that are used. This will include use of quieter equipment, localised screening and control of working hours in line with the 'Code of practice for noise and vibration control on construction and open sites' (BS5228:2009).

8.2.4 Therefore, the potential for any health impacts related to noise during construction is minimal.

Operation

8.2.5 Once operational, the Project will generate low levels of community noise. The RRF has also been designed to mitigate noise, as the building will effectively screen noise from condenser units at the nearest houses and high quality vents etc are being used which will ensure sound proofing.

- 8.2.6 Noise from traffic was raised as a concern during the engagement workshops and was also considered in the ES. The ES concluded that noise impacts as a result of project related traffic on both the access road and the wider road network would be negligible, would not result in disturbances or sleep disturbance in the early morning (5-7am) and therefore no mitigating measures were required.
- 8.2.7 While noise levels as a result of the traffic will not cause a change in the overall noise levels of the area due to the existing ambient noise levels, individual noisy events (for example for individuals who are walking along the roadside when a lorry passes) may impact on the wellbeing of people. This may result in a perception that the area is noisier, causing some annoyance and decreasing the individual's sense of satisfaction with the area. Older people may be particularly sensitive to such noise as they are more likely to place value on a quieter area than the young.

8.3 Traffic and Transport

- 1) **Health Pathway** increased road accidents and resulting fear, injury or death; congestion of road network
- 2) **Health Determinant:** Transport
- 3) **Receptors:** local road users, residents, particularly near the existing A421
- 4) **Vulnerable Groups:** young children, cyclists, elderly residents

Baseline Summary

- 8.3.1 The RRF will be reached by an upgraded access road connecting to Green Lane. Green Lane is a single carriageway road subject to a 60mph speed limit reducing to 30mph as it passes the RRF. Currently around 6% of daily two-way traffic is LGV and HGV, while only 3% of all the traffic is HGV over 3.5 tonnes.
- 8.3.2 The A421 provides a link between the M1 and Green Lane mainly comprising of a two lane single carriageway, with a short section of dual carriageway to the north of Marston Moretaine. The A421 is currently in the process of being upgraded to provide a new dual carriageway between M1 Junction 13 and the A6 Bedford Southern Bypass interchange to the south of Bedford.

Potential Impacts during Construction and Operation

Construction

- 8.3.3 The construction sequence will take place over an approximate 39 month period and involve a number of vehicular movements to and from the site. These are estimated to almost treble the volume of HGV traffic on aspects of the local road network at peak flow periods during the construction phase compared to the present flow levels. Traffic impacts associated with the construction of the development is assessed to be low in the ES when compared to the existing flows on the A421, although the increased movement of heavy machinery and plant along sections of Green Lane, in particular, will be proportionately far greater and, as such, can be expected to generate some level of annoyance and stress amongst local residents and road users due to their relative novelty and the potential for increased journey times as a result.
- 8.3.4 Increased traffic on the road can also lead to increased community severance if residents perceive roads to be more difficult to cross or there are increased journey times. Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. Those areas likely be most affected in this regard are the existing A421 alignment between Broadmead Road and Hoo Lane, and Green Lane west of the proposed site access.
- 8.3.5 Some minor discomfort and distress may be caused to cyclists and pedestrians using the local road network, caused by the increase in traffic and the fear of accidents and injury. Any increase in traffic also increases the risk of accidents resulting in injuries and potentially death of road users. This increased risk is very small, but is non-zero.

Operation

- 8.3.6 The increase in road usage is predicted to be one of the most visible characteristics of the Project, altering the type and quantity of transport movements in the vicinity of the facility.
- 8.3.7 The RRF will be supplied with waste by road. Plant operation will typically generate 530 vehicle trips per day, the majority being HGV movements. Up to 12% of these trips will occur between 05:00 and 07:00.
- 8.3.8 This will have a notable effect on the local road network, including, at its most extreme, an increase of approximately 165% in the number HGV using the existing A421 alignment between Broadmead Road and Hoo Lane and a 464% increase in HGV using Green Lane west of the proposed site access.

- 8.3.9 This increase in usage of the local road network will lead to a minimal increase in journey times and driver delays as assessed by the ES. This delay is predicted to be an average of a matter of seconds per vehicle. However, the stress and reduced driving pleasure caused by the frequent presence of HGV on the road may be disproportional to this, affecting the wellbeing of drivers and leading to increased stress.
- 8.3.10 Stakeholders expressed substantial concern with regard to the impact of increased HGV activity upon the likelihood of accidents on the local road network. However, as described in Chapter 7 of the ES, there is likely to be almost no change in the current situation with regard to road safety as a result of the Project. A minor increase in risk can be expected on Green Lane to the west of the site access. However, this will be mitigated to an extent through the provision of a new right turn facility and improved pedestrian/cycle facilities. The risk of an increase in accidents is also mitigated, in part, by the fact that will not be travelling through residential areas where possible, reducing the risks of accidents involving vulnerable groups such as children and the elderly. However, the risk of accidents will remain due to the number of external factors that influence an accident and could result in death or injury.
- 8.3.11 Perceived danger from the transport of ash and hazardous wastes was also repeatedly raised by stakeholders. The number of HGV movements anticipated to be associated with the Flue Gas Treatment residue process will be very low. The consequent probability of an accident occurring is also considered to be low and this material is not statistically considered to represent a health risk under these circumstances.
- 8.3.12 Although assessed in Chapter 7 of the ES as predominantly unaffected, there is concern amongst local residents that the ease and pleasure of road usage disproportionately for both pedestrians and cyclists will be reduced. This is likely to impact upon those already living or walking along the local routes.

8.4 Visual Effects

- 1) **Health Pathway:** Physical Structure
- 2) **Health Determinant:** Use of Green Space, Stress
- 3) **Receptors:** Local residents, recreational walkers
- 4) **Vulnerable Groups:** None identified

Baseline Summary

- 8.4.1 The Application Site's local landscape context is agricultural in nature with dispersed settlement, and patches of woodland, but is disturbed by industrial activity and land-uses. Natural features are heavily punctuated with remnants of the brick industry, including stacks and clay pits. The ongoing restoration of redundant sites, proposed new development and the work of the Forest of Marston Vale also evokes a sense of evolving landscape character.
- 8.4.2 The majority of the Application Site lies within two redundant clay pits previously used by the Stewartby Brickworks. Typical of such pits within Marston Vale, these are currently partly water filled and identifiably man-made. The site is immediately abutted by the Midland Main Line to the east running on an embankment, and the Marston Vale Branch Railway Line to the west.

Potential Impacts during Construction and Operation

- 8.4.3 During the 39 month construction period, some construction activity will be visible, with taller elements of plant and machinery being evident above intervening vegetation and landform at times. However, this will be seen in the context of the Stewartby chimneys which break the skyline in many locations, and will only be temporary.
- 8.4.4 Once fully constructed, the main features will remain consistent. However, the RRF, and particularly the stack, will be an obvious new built element on the local landscape. However, this change will not result in the loss of any sensitive landscape features.
- 8.4.5 As detailed in the Land and Visual Impact Assessment Non-Technical Summary, the Project will result in changes to short distance views as a consequence of the close proximity of the Project to the representative visual receptors. However, in the middle to long distance views, the Project will be less apparent, set within the wide panorama of the Vale, which includes urban areas, industrial land-uses, transport infrastructure, and other tall structures such as pylons and the Stewartby chimneys.
- 8.4.6 As the vegetation surrounding the proposed RRF, including that resulting from the Landscape and Ecological Strategy, becomes more mature and the facility becomes more absorbed into the character of the local area, the visibility of the RRF will decrease. This decrease is less notable for those who currently use the Site or its immediate surroundings for leisure activities etc.

- 8.4.7 This change in the visual landscape will provide a physical focus and constant reminder of concerns associated with the project, including the changes in air quality and the traffic and impacts to green space in the area. The change is likely to impact on the wellbeing of the local residents, especially in the earlier years of operation when planting for screening is less developed.
- 8.4.8 Once operational, the RRF will require a lighting regime throughout the hours of darkness. The majority of lighting is confined to the base of the pit, filtered by intervening vegetation and will be seen in the context of other light sources in the Vale. Additional Project light sources will include some lighting associated with the site approach road junction and visitor car park as well aircraft warning lights on the stack, which will be readily visible. A lighting strategy has been developed to establish lighting standards and controls appropriate to the rural environment. Some light spill will be visible to the local community, but it is not expected to be damaging to health.

8.5 Accidents and Trespass

- 1) **Health Pathway:** accidents, illegal access to site.
- 2) **Health Determinant:** physical environment
- 3) **Receptors:** those accessing site illegally
- 4) **Vulnerable Groups:** none identified

Baseline Summary

- 8.5.1 At the present time, crime in the four wards which surround the site is similar to but slightly lower than the national average. Taking into account the level of crime, the rural location of the area and the nature of the site as well as that during consultation the site was not discussed as being a focus for anti-social behaviour, it has been assumed that the site is not a known meeting point for groups or a focus for antisocial behaviour.

Potential Impacts during Construction and Operation

- 8.5.2 The likelihood of a worksite incident occurring involving a community member is low; especially as all activities will take place within fenced site boundaries with limited access to non-project employees. In addition, the small number of residents close to the area further reduces the likelihood of any incident occurring. Any incidents that do occur are likely to be as a result of site trespass, which may occur due to the duration of the construction. Opportunities for trespass will be further minimised due the entrance having automated gates that are remotely controlled from the Security Gatehouse building which will be located with a clear view of the vehicle and pedestrian entrance and operational building of the EfW Facility. Should an incident occur, it is unlikely to have any health affect on the community as a whole and there is sufficient capacity within the health service to deal with such an event without negatively impacting on the health of others within Bedfordshire.
- 8.5.3 It was reported during stakeholder engagement that there is particular concern for the health and safety of workers at the facility due to perceived poor levels of health and safety employed by Covanta at similar facilities in the USA. However, the risk of an accident involving a worker is low due to the nature of the work undertaken and the Health and Safety Guidelines that exist in the UK. Any event that does occur will have a negative effect on the health of the individual, but in terms of population health the effects will be minimal as the additional pressure on the health services and diversion of services from the local community will be small.
- 8.5.4 Traditionally, construction work sites can become a focus of antisocial behaviour and crime, especially for youth groups. For this Project, antisocial behaviour is unlikely due to the location of the site, the nature of the nearby community, fencing of the construction site and due to the fact that the area is rural and levels of crime in the area is not particularly high.
- 8.5.5 Should crime or antisocial behaviour occur on the site, this will have a negative affect on the wellbeing of the local population and most likely for residents in Stewartby and Marston Moretaine due to their proximity to the site.

8.6 Green Space

- 1) **Health Pathway:** physical activity, restoration
- 2) **Health Determinant:** physical environment
- 3) **Receptors:** users of green space, local residents
- 4) **Vulnerable Groups:** none identified

Baseline Summary

8.6.1 The RRF site comprises two large former clay pits, Rookery North and Rookery South, separated by an east-west spine of unexcavated clay. The Project is located close to a number of conservation areas, including Stewartby and Millbrook. The site is also close to a number of parks including Ampthill Park, a registered historic park, the Marston Vale Millennium Country Park which is part of the Forest of Marston Vale and Stewartby Country Park which includes Stewartby Lake. Generally, the area is quite rural, with a lot of the local area given over to agricultural uses. Therefore, while there is green space, it does not have recreational value.

Potential Impacts during Construction and Operation

8.6.2 During construction and operation, the site will be visible from existing areas of green space, most notably Marston Vale Millennium Country Park. Therefore, it may impact on the use and value placed on the park facilities. Green space and landscapes are known to have a restorative function as well as helping to release stress. As such, the placement of the facility may reduce the restorative function of the Park and lead to a decreased sense of wellbeing for users both current and future.

8.6.3 In addition, if the presence of the facility does discourage people from using the Park, as suggested by some participants in the engagement workshops, then this may also reduce the levels of physical activity of these people if they do not access alternative areas. Physical activity is important for health of the population and helps to prevent many of diseases that are currently the focus of public health efforts, including obesity, heart disease and stroke, as well as a number of mental health issues including depression.

8.6.4 However, the Project will also result in the creation of some additional green space in terms of landscaping improvements and the creation of new rights of way across the area, which were previously severed as a result of the clay works. However, it should be noted that the community does not consider this to be high value Green Space or believe that they will use this area, due to the proximity to the RRF. Therefore, they suggest that it will not provide health benefits in terms of physical activity or restoration.

8.7 Socioeconomic Issues

- 1) **Health Pathway:** employment opportunities, effects on house prices
- 2) **Health Determinant:** employment, income, housing
- 3) **Receptors:** all nearby residents

- 4) **Vulnerable Groups:** none.

Baseline Summary

- 8.7.1 Employment is relatively high in this part of Bedfordshire, by national standards, although many of the people in employment travel to London, Bedford or Milton Keynes to work. However, levels of unemployment are increasing in the area. By most measures of deprivation, mid Bedfordshire is amongst the least deprived in the country. The local population should therefore be resilient to any changes.

Potential Impacts during Construction and Operation

- 8.7.2 The construction of the RRF is estimated to require an average workforce of around 320 persons for some 39 months of construction. In terms of health the benefits of these employment opportunities will be limited to the individuals who find employment for the duration of the employment. The majority of the employment opportunities available are not of the nature and type that will confer long term health benefits on the community as a whole or the individuals who take up these jobs. The presence of this workforce is unlikely to place additional demands on local services, eg health care facilities such as hospitals that can not be met within the existing capacity. The presence of a much larger construction workforce for the new A421 is not reported to have caused any problems for the local communities. Therefore, even if workers are brought into the area, this is unlikely to result in negative health impacts.
- 8.7.3 Once operational, the Project will provide a smaller number of employment opportunities for the local communities. The scale of the employment opportunities is unlikely to have any health benefits at the population level, although the individuals may benefit if moving from an unemployed status.
- 8.7.4 There is limited evidence in the literature that developments such as the Project can have a temporary effect on house prices. This evidence base is also contradictory and therefore it cannot be assumed that such an effect will occur. In the event that it does, any individuals who find that they incur a reduction in the price of a property they wish to sell could suffer some effects on their wellbeing.

8.8 Social Capital

- 1) **Health Pathway:** community changes
- 2) **Health Determinant:** social capital
- 3) **Receptors:** all nearby residents

- 4) **Vulnerable Groups:** elderly, young people and those with low socio-economic status.

Baseline Summary

- 8.8.1 The population in the study area is made up of predominantly white and relatively affluent communities, as shown by the IMD indicators which reflect high levels of education (qualifications) and low, albeit growing, levels of unemployment in the area. This overall summary does not preclude there being pockets of greater deprivation within the area considered. It appears from the engagement undertaken for the HIA that there is a good sense of community cohesion between the four wards and that the community as a whole is able to work together. As with other areas where developments are opposed, community cohesion has been demonstrated by the establishment of opposition and action groups against developments, such as the RRF. Evidence from stakeholder engagement indicates that there are low levels of trust and reciprocity between the community and Covanta (including the consultants it employs to undertake various studies) and a lack of trust in the Environment Agency and its ability to monitor and to control Covanta's activities in the future.
- 8.8.2 Residents' views and opinions of the area have improved since the closure of the brick works and Brogbourgh Landfill in 2008. They place value on the area in terms of its location, natural landscape and rural location.

Potential Impacts during Construction and Operation

- 8.8.3 The construction and operation of the project is likely to affect the following underpinnings of social capital:
 - 1) views about the area; and
 - 2) reciprocity and trust.
- 8.8.4 The operation of the Project is likely to reduce people's positive associations of living in the area as a result of perceived negative health effects and decreased environmental quality, eg perceived and actual changes to the visual environment and perceived harmful emissions to air. People who view the area more negatively may experience impacts on their wellbeing and mental health. It is thought that the negative health impacts associated with a decreased satisfaction in the area will be felt most strongly in Stewartby and Marston Moretaine, as these are the communities located closest to the site. Potential negative health impacts will not be limited to these two wards.

- 8.8.5 The Project will be operational for approximately 35 years. Stakeholder views varied regarding concerns about the presence of the facility over time. Some of them expressed the view that people would get used to the presence of the facility after a few years and therefore any impacts on health associated with views about the area may become less prevalent over time and that the ongoing presence would be a concern in relation to long term impacts to health.
- 8.8.6 During stakeholder engagement many members of the local community expressed a lack of trust in both Covanta and the Environment Agency (EA). Reported reasons for the lack of trust in Covanta include the perceived poor health and safety records in their facilities in USA and breaches of emission standards in the USA. The lack of trust in the EA is based on local experiences of when the brickworks and Brogborough Landfill were both operational and were allowed to breach limits and to extend the duration of operations illegally. A strong feeling was expressed by many stakeholders that emissions limits will be breached by the Project, that the facility will start taking other wastes such as clinical and hazardous wastes and that the permit conditions for the facility will be extended. In addition, it was reported by stakeholders that the area is becoming a 'dumping ground' for other people's and counties' waste, because of the history of landfill in the area.
- 8.8.7 The lack of trust stakeholders reported in Covanta and the EA can have a negative effect on wellbeing, mental health and self rated health. Those who are likely to feel the potential negative health impacts associated with low social capital most strongly are those with a low socio-economic status due to the loss of sense of control over the area they live in and an inability to change their circumstances. However, any resident who feels that they do not have control over the area they live in is also likely to suffer from decreased wellbeing and mental health impacts, regardless of their socio-economic status.
- 8.8.8 The decrease in social capital may be reversed to some extent once the facility is operational and severed footpaths are reinstated, the visitors centre/educational facility is open and community investment is established. These measures will help to reduce any negative impacts on health and wellbeing felt by the local communities by providing people with accessible green space and additional facilities which may improve the value people place in the area they live. Furthermore, once the development is operation, Covanta and the EA can start to build trust with the local community by ensuring emissions levels are not breached, and through sharing information and data about the Project.

9.0 Summary and Recommendations

9.1 Summary of Effects

- 9.1.1 Any measurable effects on health as a result of changes to the physical environment (eg changes in air quality or the noise climate) are not expected to occur as a result of the proposed RRF. The evidence from the ES is that any such changes would be very small in magnitude and insufficient to cause notable health effects to the local community. This conclusion is contrary to the expectations of the local community, for whom such effects represent a prominent anxiety. Some means of addressing these concerns will be required if and when the Project proceeds.
- 9.1.2 The experience of the former Stewartby brickworks' operations provides a point of reference for residents against which to anticipate the future impacts on local air quality. In fact, the emissions to atmosphere of some important pollutants from the RRF will be less than was the case for the brickworks and in particular the emissions of sulphur dioxide. The sulphur compounds released by the brickworks were responsible for causing local odour problems and ultimately led to its closure through its inability to comply with the relevant air quality standard. The RRF will emit a maximum of 59 tonnes per annum of SO₂, as compared with nearly 4,000 tonnes per annum from the former brickworks.
- 9.1.3 Another memory of the brickworks' operations that has caused anxiety about future emissions from the RRF is the belief that the presence of temperature inversions will inhibit effective dispersion and cause the air quality impacts to be greater than anticipated. Whilst it may be the case that the dispersion of the brickworks' plumes were on some occasions influenced by the surface based stable layer underneath a temperature inversion, the dispersion model predictions presented in the ES have taken such meteorological conditions fully into account and can be relied upon with confidence.
- 9.1.4 The evidence base for assessing health effects of emission to atmosphere is very strong and the analysis presented in the ES provides a clear and quantitative estimate of the consequences of the RRF proposal. When taken in the context of the health status of the surrounding population and background rates of, for example, mortality and hospital admissions, the estimated health effects can justifiably be described as negligible.

- 9.1.5 The assessment also considered the long term effects of the additional exposure to dioxins and metals, through both inhalation and ingestion following uptake into the food chain. There is a non zero and quantifiable risk of contracting cancer for a local resident, but this risk is extremely small and well below the level which is generally considered to define tolerability.
- 9.1.6 The treatment and transport of bottom ash and fly ash does not represent a risk to health, because there is no viable pathway of exposure for members of the public.
- 9.1.7 One of the most visible features of the scheme will be the increase in HGV vehicles on some of the local roads. Despite community concerns to the contrary, the proposed RRF is not expected to have any more than a minimal impact upon local journey times, road user or pedestrian safety, if the Traffic Management Plan is implemented at all times. However, it is recognised that being passed by a large vehicle may reduce the amenity value of some stretches of road for pedestrians and cyclists.
- 9.1.8 Similar reduced amenity is strongly perceived by local residents to be inevitable on local footpaths and green spaces, principally as a result of the RRF's visual impact. This lessened enjoyment may reduce the levels of physical activity of users, if they cease to use the areas as frequently as at present or do not access alternative areas, with possible implications for their physical health.
- 9.1.9 The employment opportunities offered by construction and operation of the RRF are unlikely to have any measurable benefits for health in the local communities. There will be some additional employment and income from the indirect effects of the additional employment.
- 9.1.10 The evidence for an effect on house prices is sparse and partly contradictory. No definitive prediction can be made on the effect that the Project might have on house prices in the short term, although the possibility that prices might be depressed for a period of time is plausible, ie for a number of years. In these circumstances, there could be an effect on the wellbeing of individuals who see a reduction in the price of a property they wish to sell.

- 9.1.11 The most likely adverse effects on health and wellbeing identified are associated with people's feelings about the area. Should such feelings about the local environment be widespread and entrenched, then there will be some consequent adverse health effects, in the form of mental health and possibly stress. Such health effects are not possible to define in quantitative terms and are subject to uncertainty. It should be observed that such a response at the community level has not been reported in other host communities for EfW facilities in the UK or elsewhere, and such an outcome here can only be regarded as speculative.
- 9.1.12 The scheme has the potential to bring some health benefits through the provision of an enlarged Public Rights of Way network, provision of community trust funds and limited additional employment opportunities, especially if these are taken up by members of the local community.
- 9.1.13 Finally, it should be noted that this HIA has considered the effects on the host community of a specific Project to treat half a million tonnes of residual waste. Whilst there is a genuine 'do nothing' scenario for the people affected in this case, there is no 'do nothing' scenario for the waste to be treated. Whichever treatment method is adopted, at whatever location or locations, there is an associated health effect.

9.2 Measures to maximise Benefits and Minimise Adverse effects

- 9.2.1 A number of mitigation measures have been generated as result of the EIA and are reported in the ES. These measures have been taken into account when undertaking the assessment of potential health impacts.
- 9.2.2 Key mitigation measures relevant to health from the ES are described below.

Air Quality and Dust

- 9.2.3 During construction, measures will be implemented to minimise the generation of dust and avoid nuisance to the nearest residences and it is recommended that the Code of Construction Practice includes provision for visual monitoring of dust when there is a wind of greater than 3m/s, from the northeast during periods when there is no precipitation or the ground is dry.
- 9.2.4 The Construction Code of Practice will include measures for responding to dust nuisance complaints.

- 9.2.5 Once operational, the RRF will be obliged to comply with the requirements of the Waste Incineration Directive and the conditions of the Environmental Permit (granted by the Environment Agency). This will ensure that emissions are very low and that the local air quality impacts are very small.
- 9.2.6 It is expected that the Environment Agency will require Covanta to conduct ambient air quality monitoring and sampling of soils after the RRF becomes operational. This should provide some reassurance that the facility is not having an impact on local air quality.

Noise

- 9.2.7 The proposed mitigation for the Project is included as mitigation by design, no post construction measures are proposed apart from monitoring compliance with design targets.
- 9.2.8 Construction methods in line with BS 5228: 2009 will be implemented to minimise construction noise effects. These would include selection of quieter equipment, localised screening, control of working hours and restricted delivery and access routes.
- 9.2.9 An appropriate Code of Construction Practice will be adopted.
- 9.2.10 Noise will be monitored to establish compliance with design targets and community concerns relating to noise investigated as appropriate with progress reported back directly to the complainer and/or through the Community Liaison Panel.

Traffic and Transport

- 9.2.11 Covanta will enforce restricted delivery times to the following:
- 1) between 0500 and 2300 on Monday to Saturday;
 - 2) no waste deliveries will be accepted on Sundays (except under exceptional circumstances or in an emergency);
 - 3) no waste deliveries will be accepted on Christmas Day, New Year or on Easter Day (except under exceptional circumstances or in an emergency).
- 9.2.12 An HGV routing plan has been compiled which requires:
- 1) all HGV travelling to and from the Application Site do so along Green Lane to the west connecting to the old A421 in order to gain access to the new A421 dual carriageway;

- 2) Rookery South HGV traffic travelling to and from the south would route through the Green Lane/A421 junction, then route along the future reclassified section of the existing A421 as far as the new grade separated Marston Moretaine Junction in order to gain access to the new dual carriageway south to the M1 Junction 13;
- 3) Rookery South HGV traffic travelling to and from the north would route through the Green Lane/A421 junction, then route along the future reclassified section of the A421 as far as the new grade separated Marsh Leys Junction in order to gain access to the new A421 dual carriageway south of Bedford; and
- 4) no HGV will arrive from or exit to Stewartby Way and toward the B530.

- 9.2.13 All company HGV will be installed with a GPS based tracker system, to enable an overview of all live and historical vehicle movements. Penalties, including financial and disciplinary sanctions, will be levied against any transgressors.
- 9.2.14 A Framework Travel Plan will be implemented to minimise the impact of staff related traffic, in order to maximise non-car travel and minimise traffic impact. This document will accompany the DCO application.
- 9.2.15 To limit the impact of construction traffic, a few buses will be provided to transport some of the workers to and from the Rookery Pits site.
- 9.2.16 Physical enhancements to the road network will be provided, including:
- 1) a priority junction with a ghost island right turning lane to minimise the impact of vehicles upon the adjacent Green Lane level crossing;
 - 2) a centre island refuge crossing on Green Lane approximately 50m to the east of the Rookery South RRF access;
 - 3) provision of a 3m wide combined cycleway/footway along the southern verge of Green Lane from the RRF access, to the crossing point 50m to the east as an extension of the provision along the access road;
 - 4) a 2.5m wide footpath from the level crossing to the access to the Stewartby Water Sports Club;
 - 5) footpath and connection signing to link the footpath at the Green Lane level crossing to the Stewartby lake footpath linking to the existing A421;

- 6) Provision has also been made for the possible inclusion of an antidazzle screen fence between the access road and Marston rail line should it be considered necessary by Network Rail at a future point in time.
- 7) Covanta is also investigating, in conjunction with Network Rail, the potential to upgrade the existing Green Lane level crossing to improve safety.
- 8) a Rights of Way (ROW) strategy outlines improvements to the ROW network in the surrounding area. The strategy comprises of an extensive network of dedicated rights of way with key linkages to the east and west of the Application Site, proposing:
 - a. the footpath with cycle rights abutting the access road are to be extended along its eastern side providing employee and visitor access from Green Lane to the proposed RRF;
 - b. the permissive footpath around Rookery North will be dedicated, including cycle rights, enhancing accessibility between the Green Lane entrance, the RRF and existing public rights of way; and
 - c. the dedicated footpath adjacent to the Midland Mainline will be upgraded to include cycle rights, providing a continuous cycling route around North Rookery.
- 9) a more direct and safer link is proposed between Stewartby, and Stewartby Lake by improving the footpath provision along Green Lane. This will enable pedestrians to have a continuous route along Green Lane to FP72, so improving links between the Country Park and Rookery North Pit.

Visual Effects

9.2.17 The landscape and visual context of the Project has been considered from the early design stages, informing the layout, form and scale of the Project, including:

- 1) designing the RRF to integrate into the landscape as much as possible (shape, colour, material, etc);
- 2) developing a Landscape and Ecological Strategy to minimise the visual impact of the RRF, including creating a wooded fringe to anchor the building in the landscape and provide screening or filtering of certain elements of the operational development; and
- 3) computer generation and consultation on proposed designs to minimise the impact of the RRF when constructed at the site.

Green Space

- 9.2.18 As part of the Landscape and Ecological Strategy, vegetation will be planted to screen the much of the RRF from view from key local green spaces.
- 9.2.19 As part of the PROW plan, the permissive footpath around Rookery North will be dedicated, including cycle rights, enhancing accessibility between the Green Lane entrance, the proposed RRF and existing public rights of way.

Socioeconomic Issues

- 9.2.20 To encourage local employment, the draft Section 106 agreement accompanying the DCO will stipulate that all Covanta jobs at the RRF will be advertised for a minimum of 14 days locally before being advertised more widely. Covanta also has a training policy, and will offer on the job training to employees.

Trust

- 9.2.21 The CLP will run throughout construction and operation or as long as the members of the panel wish it to continue.
- 9.2.22 Complaints will be recorded in a complaints register and investigated as appropriate with progress reported back directly to the complainer and/or through the CLP.
- 9.2.23 Further details on these measures can be found in the ES. The HIA has generated additional recommendations for consideration by Covanta, as set out below.

9.3 Recommendations

General

- 9.3.1 ERM proposes the following recommendations to minimise the negative impacts to health and maximise the positive impacts. Covanta's response to these recommendations can be found in *Annex D*.
- 1) ensure that tree planting is carried out in such away as to achieve the maximum and the earliest screening when the RRF is viewed from nearby green space;
 - 2) ensure open communication and sharing of information, including:
 - a. the display of emissions data on the website and in the visitors centre, in a form that is accessible and as close to real time as possible;

- b. the provision of information on Covanta's operations and issues globally (notably in the USA);
 - c. the production and distribution of regular newsletters describing project progress, highlights, emissions data and any formal breaches of permit etc; and
 - d. a demonstration that the processes and procedures for dealing with bottom ash and fly ash cannot result in harm, even in the event of road traffic accidents.
- 3) provide transparency around the method used to develop community benefits programmes;
 - 4) establish a community complaints procedure in addition to the retention of the Community Liaison Panel; and
 - 5) communicate the plans for responding to accidents within the Operations Area, as contained in the Environmental Permit application for example.

Construction Recommendations

9.3.2 The following measures specific to construction should be adopted:

- 1) ensure contractors are signed up to the Considerate Constructors Scheme⁹ and that they operate best practice in this regard;
- 2) communicate information regarding construction activities throughout the construction period to the most local communities; and
- 3) ensure that the construction site area is secure and not vulnerable to trespass.

Operation Recommendations

9.3.3 The following measures specific to operation should be adopted throughout the lifetime of the facility.

- 1) implementation of effective maintenance and upgrading of facility as appropriate, including fitting of best practice technology when available, as directed by the Environment Agency as part of the Environmental Permit review; and
- 2) appropriate and sensible procedures should be put in place to prevent inappropriate waste being put in the furnace and these procedures should be explained to the Community Liaison Panel.

⁹ <http://www.ccscheme.org.uk/>