

## Preface

This document is Volume 4: Non-Technical Summary of the Environmental Statement that accompanies the planning application for the proposed Energy from Waste Combined Heat and Power Facility. The Environmental Statement also comprises the following separate volumes:

Volume 1: Main Text

Volume 2: Figures

Volume 3: Appendices

## Revision Schedule

### **Environmental Statement Volume 4: Non-Technical Summary**

Rev	Date	Details	Prepared By	Reviewed By	Authorised By
00	18 April 2011	Draft	<b>Various Specialists</b> and <b>Alexis Huggins</b> Environmental Consultant	<b>Ian Roach</b> Principal Environmental Planner	<b>Andrew Wooddisse</b> Associate Waste Planner
01	9 May 2011	Final for Planning Application	<b>Various Specialists</b> and <b>Alexis Huggins</b> Environmental Consultant	<b>Ian Roach</b> Principal Environmental Planner	<b>Andrew Wooddisse</b> Associate Waste Planner

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The methodology adopted and the sources of information used by URS Scott Wilson in providing its services are outlined in this Report. The work described in this Report was undertaken between May 2009 and April 2011 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances.

Where field investigations are carried out, these have been restricted to a level of detail required to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements might need to be made after any significant delay in issuing this Report.

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## Table of Contents

- Introduction
- Environmental Impact Assessment
- The Need for the EfW CHP Facility
- Site Location and Setting
- Description of the Proposed Development
- Alternatives
- Landscape and Views
- Ecology and Nature Conservation
- Cultural Heritage
- Land and Water Quality
- Water and Flood Risk
- Traffic and Transport
- Air Quality
- Noise
- Construction Waste
- Daylight, Sunlight and Overshadowing
- Economy
- Health and Well-being
- Cumulative Effects

## Introduction

Through a competitive tendering process, MVV Environment Devonport Limited (MVV) has been awarded the South West Devon Waste Partnership's (SWDWP) residual waste treatment and disposal contract. The SWDWP is a collaboration that has been established between Plymouth City Council, Torbay Council and Devon County Council to provide a long term solution to deal with waste from the southwest Devon area which is left over after re-use, recycling and composting.

MVV's proposal is to construct and operate an Energy from Waste (EfW) facility, incorporating Combined Heat and Power (CHP) technology, on land currently situated in the north east of Her Majesty's Naval Base (HMNB) Devonport, Plymouth. This EfW CHP facility will, depending on the composition of the waste and therefore its energy content, have capacity to process up to 265,000 tonnes per year of waste although it is expected that 245,000 tonnes per year will be processed. The waste will be combusted and the heat will be used to generate steam. The steam will drive a steam turbine and generate renewable electricity for use at the facility, to supply Devonport Dockyard and HMNB, and for export to the National Grid. Steam will also be extracted from the turbine and fed into the Devonport Dockyard and HMNB steam network to be used for heating.

## Environmental Impact Assessment

Environmental Impact Assessment (EIA) is concerned with ensuring that the likely environmental effects of proposed major development projects, together with alternative technologies and locations, are considered thoroughly in order to inform the authority making the decision on the planning application. The process requires the developer to prepare an Environmental Statement to accompany the planning application, which covers a variety of environmental topics of relevance to the proposed development and its location, and the mitigation measures which have been incorporated to reduce the impact of the development. The Environmental Statement is then used as a basis for statutory authorities such as the Environment Agency, Natural England and English Heritage, as well as members of the public and other interested parties, to comment upon the proposed development and its anticipated environmental effects, before a decision on the application is taken.

Volumes 1, 2 and 3 of the Environmental Statement comprise the Main Text, Figures and Appendices respectively. Volume 4 of the Environmental Statement is the Non-Technical Summary (this document) and explains in non-technical terms the proposed development and the key effects of it on the environment. The Environmental Statement has been prepared by Scott Wilson, planning and environmental consultants to MVV. Scott Wilson is one of the leading multidisciplinary consultancies in the UK and has considerable experience of building design, co-ordination of complex EIAs and obtaining planning permission for major waste management projects. Scott Wilson is a registrant to the EIA Quality Mark scheme run by the Institute of Environmental Management and Assessment.



## The Need for the EfW CHP Facility

At present, landfill is the only means of disposal of residual waste that is not recovered, recycled or composted in this area. Landfilling has a number of environmental problems, not least that landfill sites generate greenhouse gases, which are widely recognised to contribute to global climate change. At a

European and National level there is recognition of the need to reduce reliance on landfill by managing waste as a resource and focussing on reducing waste, re-using materials, recycling and composting, and recovering energy (electricity and if possible also heat) from the 'residual' waste that is left. Landfill should be the last option. This is known as the Waste Hierarchy. Remaining landfill space in the area is increasingly scarce and taxes on the landfilling of waste are being increased year-on-year in order to make it an even more expensive and less desirable waste management option. Councils within the SWDWP area anticipate exceeding the landfill allowance which has been set by the Department of Environment, Food and Rural Affairs for each Waste Disposal Authority by 2013. An alternative to landfill that is further up the Waste Hierarchy is therefore imperative. The proposed EfW CHP facility would provide an alternative.

## Site Location and Setting

The location of the site is shown in Figure 1 overleaf. The site is located in the northeast of HMNB Devonport. It is in the ownership of the Ministry of Defence (MoD) and will be leased by the MoD to MVV.

The central part of the site on which the EfW CHP facility building will be constructed was until recently used by a firm called Ashcroft to process demolition rubble created from different construction projects throughout the naval base and dockyard. Some piles of rubble and skips remain on site and the MoD is in the process of disposing of these appropriately prior to making the site available for MVV.

The site also includes a large portion of Blackies Wood. This will not be the subject of built development but will be subject to landscape and ecological management.

At the south-western end of the site is a raised area of land which is known colloquially by the MoD as 'Table Top Mountain'. It is used by the MoD for storage of equipment, but will be used by MVV as the construction compound. There is a general shortage of external storage space within HMNB Devonport and this area is required long term by the MoD for storage purposes so at the end of the construction period it will be returned to MoD.

Access to the site is from the Camel's Head junction of Weston Mill Drive and Wolseley Road, through parts of HMNB Devonport. Weston Mill Drive is a Principal Road and provides the highway link between HMNB Devonport/Devonport dockyard and the trunk road network (A38). The A38 is situated approximately 1.5km to the northeast of the site. The first part of the access road will be around the edge of an existing car park to the north of the main Camel's Head access road. A tarmac access road crosses Weston Mill Stream at two points to access the central part of the site and a new bridge will be built to replace the existing bridges.

The site is outside the MoD's dockyard explosive safeguarding zone and so no additional measures are required for building design. A Warships in Harbour Risk Assessment, Nuclear Safety Case Risk Assessment and Helicopter Flight Path Risk Assessment have all been carried out by the MoD and no restrictions on the proposed EfW CHP facility have been identified.

## Description of the Proposed Development

The main purpose of the EfW CHP facility is to treat the waste from the southwest Devon area that cannot be recycled, reused or composted. The facility will therefore primarily deal with municipal waste collected by the SWDWP Authorities. The remaining processing capacity will be used to process similar commercial and industrial waste from local businesses in the surrounding area.

The overall design masterplan for the site is to provide a facility which combines high quality architectural design with a form that complements the complex dockyard context of an industrial setting with a backdrop of a woodland area with varying topography and relatively close proximity of residential properties.

An artist's impression is provided in Figure 2 overleaf.



Figure 1: Site Location (site boundary shown in red)



**Figure 2: Artist's Impression (from west looking east)**

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## Working Hours

The EfW CHP facility will be operational 24 hours a day, 7 days a week burning the waste and generating steam and electricity.

The hours when lorries can deliver waste to the site and take away the ash and other residues and therefore when there will be greater amounts of activity outside the building will be restricted to the following times:

Monday to Friday	08.00 – 19.00
Saturday	08.00 – 18.00
Sunday	08.00 – 16.00
Bank Holidays (except Christmas Day and Boxing Day)	08.00 – 18.00
Christmas Day	Closed
Boxing Day	08.00 – 16.00

MVV recognises that there may be some occasions when the SWDWP may request that the facility accepts Contract Waste deliveries outside the normal opening hours, for example in the case of an emergency or to accommodate the delivery of Contract Waste where Authorised Vehicles have been unavoidably delayed; or in other similar circumstances. It is therefore proposed that the facility be able to accept waste outside the operating hours stated above with agreement with the Local Planning Authority.

The Workshop building has limited doors and openings, none of which face the nearby housing, and it will normally only be used during the day.

## Main Building

The waste treatment process will take place within the Main Building and no waste will be stored or processed outside the building. The maximum height of this building will be 45m and the minimum height 15m. The total length of the building will be 134m and the width will vary between a minimum of 30m and a maximum of 81m.

## Tipping Hall

The Tipping Hall will be situated within the Main Building which is fully enclosed. The Tipping Hall provides an enclosed reception area for incoming vehicles delivering waste to the facility. Within the Tipping Hall delivery vehicles would transfer waste directly into the Waste Bunker. To minimise odours and dust, air flow will be carefully controlled and used in the combustion process.

## Waste Bunker

The Waste Bunker will be situated in the Main Building. Prior to being burnt, waste will be stored and mixed within the Waste Bunker. Due to the continuous movement of waste it would be an environment to which vermin, such as rats, would not be attracted.

## Bale Store

The Bale Store, situated within the Main Building, allows the receiving, storing, transferring and diversion of waste when the facility is not available for any reason, for example during planned maintenance. Storing waste in this way avoids the need for waste to be diverted to landfill. If the Bale Store is needed, the waste will be compressed into bales measuring approximately 1.5 square metres to remove all of the air from the waste. The bales are then wrapped in strong plastic film. The film provides a full seal against air and pests, and is highly resistant to cuts and tears. The waste in the bale does not degrade due to the lack of oxygen and moisture. The bales would in due course be split and fed into the normal waste bunker at times when deliveries were not able to meet the capacity of the plant. Such baling is routinely used in Germany.

## Turbine / Boiler House

The Turbine / Boiler House will be the largest part of the Main Building and where the main incineration process will take place on a grate. It will contain the furnace and boiler and a steam turbine which will generate electricity from the superheated steam produced in the boiler. The size of this part of the building is dictated by the need to retain gases within the combustion chamber for more than 2 seconds at a temperature in excess of 850° C.

## Air Pollution Control System

An Air Pollution Control System will be provided. The gases resulting from the combustion of waste will be cleaned prior to being released into the atmosphere via the 95m chimney. Emissions released through the stack will be continuously monitored to ensure they meet strict requirements enforced by the Environment Agency and do not pose an unacceptable risk to the health of the local population.

## Air Cooled Condensers

Air Cooled Condensers will be used to condense the steam from the steam turbine. This is more efficient than the tall cooling towers normally associated with power plants and produces no visible vapour plumes.



**Photograph 1: Crane operator and hydraulic grab crane in action**



**Photograph 2: Typical bunker view with crane control cabin (background), tipping chutes (right), stored waste (centre) and feed hopper (left, flap gate closed)**



**Photograph 3: Waste burning on a grate**

### **Administration Block and Community Area**

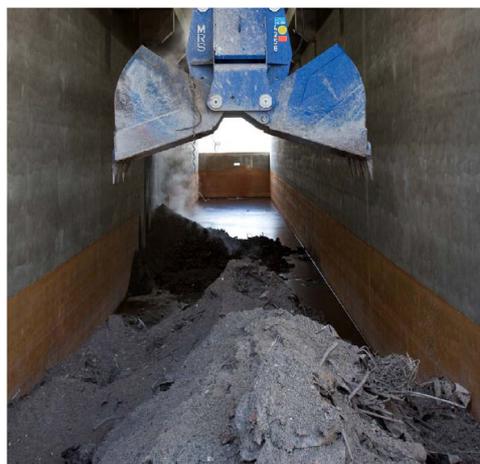
The Administration Block will contain the offices, staff welfare facilities, and meeting rooms. The Community Area will be located within the Administration Block, designed to accommodate exhibition areas, and meeting rooms for visitors and community groups, including disabled visitors. There will be a roof terrace overlooking the site and the adjoining Dockyard and explanation boards to describe the activities and points of interest.

### **Control Room**

A continuously manned Control Room will be provided in the Waste Bunker from which the facility will be operated and monitored.

### **By-products**

By-products will be produced in the form of incinerator bottom ash (IBA), which will be transported off site in covered vehicles and recycled for use in the construction industry, and by-products from the air pollution control (APC) system, which will be transported off site in sealed tankers for disposal off site at a licensed hazardous waste landfill.



**Photograph 4: Typical incinerator bottom ash in bunker**

## Workshop and Stores Building

One workshop and stores building 10m high will be provided at the western end of the site for the storage of equipment and chemicals.

## Electricity Cables and Steam Pipes

New electricity cables and steam pipes will need to be installed and existing pipework within the Dockyard upgraded in order to export the electricity and steam produced at the facility for use both within the Dockyard and for export into the National Grid.

## Access

All vehicles will access the site from the Camel's Head junction. The predominant vehicle access will be from the A38 via the A3064, Western Mill Drive. Incoming vehicles will then travel along the MoD-owned Northern Access Road towards the Camel's Head Gate of HMNB Devonport. Vehicles will turn right, across Northern Access Road, into the new access proposed through the MoD car park.

Sufficient off road queuing areas will be provided to meet peak delivery periods and queuing on the public highway and the MoD access road will not be permitted.

At the western end of the MoD car park, the new road will pass underneath the Western Mill railway viaduct and join an existing road, prior to the EfW CHP facility weighbridges and gatehouse.

The majority of traffic movements and principal external noise generating equipment (such as the air cooled condensers) are located on the eastern side of the building, away from the closest residential properties on Talbot Gardens and Savage Road.

During the construction phase when more staff will be working on the site the former Goschen Yard will be used for car parking and buses / mini buses will transport the workers to the site.

## Ecology and Landscape Proposals

The proposal for the site incorporates the positive management of Blackies Wood; planting of native species that will provide opportunities to improve the habitat for birds and wildlife; and provide a suitable setting for the development. Trees will be incorporated towards the edge of the site, adding to the existing tree cover where possible, and helping to create a degree of connectivity between habitats. Tree planting around the site entrance will help to soften the perimeter fence and create a more interesting gateway. A swale (a shallow ditch which fills with rain water) and a pond will be created with an irregular, organic shape along the base of Blackies Wood and will be planted with suitable marginal and aquatic plant species. The development includes enhancement of and controlled access to Blackies Wood. Two trees will be felled in order to accommodate the facility, however, this is not considered to be significant.

## Sustainable Design

The EfW CHP facility achieves a BREEAM<sup>\*</sup> Pre-Assessment rating of Excellent, demonstrating its sustainable design and construction credentials.

## Construction

Subject to obtaining planning permission, construction is expected to occur between early 2012 and late 2014.

Construction works would be limited to the hours of 07.00 – 19.00 Monday to Friday and 07.00 – 13.00 on Saturday, with full time attendance of security personnel.

The number of staff will vary during the course of the construction period, from a peak of approximately 309 in October 2013 to approximately 35 at the end of the construction phase.

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<sup>\*</sup> Building Research Establishment Environmental Assessment Method

## Alternatives

### Alternative Technologies

The three SWDWP authorities have developed a Joint Municipal Waste Management Strategy, the essence of which is to increase recycling and composting and reduce the amount of waste going to landfill. The strategy examined in detail six potential technology options for the management of waste as follows:

- 1) Disposal of residual waste to landfill.
- 2) An individual EfW facility for each authority.
- 3) A single joint EfW facility located in Plymouth.
- 4) A single joint EfW facility and a joint Anaerobic Digestion facility for food waste treatment.
- 5) Three strategically located Mechanical Biological Treatment facilities (including Anaerobic Digestion), producing a Refuse-Derived Fuel to be combusted in a single new facility in Plymouth.
- 6) A per Option 5) but sending the Refuse-Derived Fuel to be combusted in an existing facility in Runcorn, Cheshire, rather than a new plant in Plymouth.

All six options underwent detailed modelling against various technical, planning, environmental, social, financial and economic criteria. Results indicated that EfW facilities with CHP have a significantly lower global warming potential than EfW facilities without CHP. The preferred option of the SWDWP authorities was a single EfW facility in Plymouth.

MVV evaluated the brief from SWDWP to develop an appropriate facility to manage residual waste in the most efficient and optimum way which would not prejudice improved performance by the SWDWP authorities in complying with the waste hierarchy of waste minimisation; re-use; recycling and composting. The development of a single EfW plant with CHP capability is considered to be the most efficient and appropriate choice of technology to manage mixed residual waste and the residues from other waste processes. It will not compete with other initiatives such as improved kerbside collection of segregated waste streams and technologies such as Anaerobic Digestion which is appropriate to treat biodegradable waste that does not contain any plastic or other contaminated material. By securing a site within HMNB Devonport which has a high energy demand and already has a heat distribution network the proposed facility is the optimum solution to manage residual waste from the SWDWP and the surrounding area.

### Alternative Sites

A detailed appraisal has been made of alternative sites. The potential to supply CHP to the dockyard and the opportunity, because of the specific North Yard location, to deliver major social and economic benefits to the dockyard, its community and Plymouth as a whole, combined with a broadly favourable evaluation against other environmental, amenity of local residents and sustainability criteria, led MVV to select North Yard as its preferred location for the EfW CHP facility. In coming to this conclusion an important consideration was the weight that should be applied to the requirements of national and local planning policy to address the causes of climate change and to promote economic regeneration, when identifying sites for new development.

## Landscape and Views

A comprehensive landscape and visual impact assessment has been undertaken.

The main development site is largely derelict and unused. Close views of the existing site are degraded by a combination of open storage and large exposed surfaces within the site itself and industrial dockyard buildings (and associated activity) on the adjacent land. The site benefits from a relatively high degree of enclosure to the north resulting from the existing topography and the extensive woodland including Blackies Wood, combined with earth bunding and a woodland buffer caused by the railway line to the east, and MoD land and buildings to the south.

The nearby wharves and dockyard have a strong influence on the character of the surrounding area through the introduction of massive scale components; these are complemented by the large sweeping landform and fields; and the expanse of the estuary adjacent to them. There are areas of high landscape quality within the area, such as the Rame Peninsula Area of Outstanding Natural Beauty (AONB), South Devon AONB and the Tamar Valley AONB. To some extent these landscapes have already adapted to the influence of the contemporary land uses, including large-scale dockyard and industrial activities.

Since the assessment has identified some significant visual effects, it is essential that the tall, built elements of the scheme should have taken account of Plymouth City Council's (PCC) Core Strategy, Strategic Objective 2: Design. In accordance with that objective, the architectural design therefore has regard to key design principles in support of PCC's vision for a high quality city. It is particularly important, not only in terms of simply complying with policy, but also for the benefit of local residents and visitors to Plymouth, that the architecture of the built form should be of a very high quality. As a building which cannot be entirely absorbed into its setting, it has therefore had to be designed to be seen and to form a local landmark – a flagship feature even – and this is what the scheme as proposed will achieve. So, in line with the expectations of LDF Policy CS02: Design, the new development is well designed to respect the character, identity and context of Plymouth's historic townscape and landscape and in particular Plymouth's unique waterfront, its local settlement pattern and wider moorland setting and nearby Tamar AONB.

Although the building will result in changes to important local and longer-distance views due to its large scale, it will also protect those views because of its striking design in terms of its form, massing, detailing, materials and colours. In this way it will promote the image of the City, through enhancement of important gateway locations and key approach corridors, such as from the railway, and from the River Tamar. Overall, therefore, it will contribute positively to the area's identity and heritage in terms of scale, density, layout and access, and additionally, at the local level, it will have public and private spaces that are safe, attractive, and accessible; and complement the built form.

The facility will inevitably have a strong presence due to its nature, scale and form, but the proposals aim to set it appropriately within its landscape context. The proposed design has evolved to be both modern and functional and represents a world class EfW CHP facility to manage waste and produce electricity and heat representing a continuation of cutting-edge development in a dockyard that has been at the forefront of technological innovation for over two hundred years.

PCC's Green Space Strategy lists the residential area of Barne Barton as a priority neighbourhood for green space investment and recognises Blackies Wood as non-accessible green space. In accordance with this Strategy, and in conjunction with the proposed improvements to the public open space area of Barne Barton north-west of Blackies Wood, the proposals will enable coordinated and beneficial control of Blackies Wood so that it can be managed both for the benefit of local communities and educational groups, and also to enhance and protect the biodiversity of the site.

The proposals will substantially enhance Blackies Wood and the adjacent public open space along Savage Road, improving both the quality of the open space and the quantity of accessible space in a manner most beneficial to the local community. Furthermore, the landscape proposals within the development area of the site will soften and assist in integrating the building into this sensitive setting comprising an unusual combination of potentially conflicting uses in the form of woodland, residential land and the industrial dockyard.

### **Landscape Masterplan**

As well as exercising particular care over the design and appearance of the building, a detailed landscape masterplan has been developed to enhance the setting.

The overall objective of the early landscape works is to provide woodland enhancements to the north of the site through Blackies Wood and partial avenue screening. All existing trees will be retained, except for the two which are known to need removal. The mitigation proposals for the EfW CHP facility are designed to integrate the proposed development into its landscape setting, whilst at the same time minimising the adverse effects on landscape character and views. These measures include planting along Savage Road and enhancement to Blackies Wood. The scheme therefore aims to achieve the following:

- Provide partial screening for residential properties on Savage Road where appropriate and practical with planting and earthworks;
- Retain existing vegetation where possible;
- Reinforce existing woody vegetation groups with additional tree and shrub planting;
- Provide planting to enhance the local and distant views of the development;
- Remove or make safe potentially dangerous trees;
- Integrate and screen structures with enveloping woodland, tree and shrub planting;
- Include a planted swale for surface run-off, a wildlife pond and reptile habitat designed to appear as natural features as much as possible with maximum habitat diversity;
- Use a mix of locally characteristic plant material and ornamental planting, at appropriate locations, robust enough to tolerate the conditions of the site; and
- Ensure that landscape treatment is compatible with other mitigation proposed and combine benefits where possible (e.g. ecology, surface water drainage).

### **Views During Construction**

The construction phase would result in a major significant adverse effect for residents of Talbot Gardens due to the location of the construction compound in close proximity to them, on Table Top Mountain. These views should however be taken in context of the existing backdrop of the cranes and activity within the dockyard.

Construction would also result in a major / moderate adverse effect for a small number of residents of Cardinal Avenue due to the elevated views from some of the houses which look over the site and construction area. These views are widespread and therefore the development is a relatively small proportion of the panoramic views afforded to these receptors.

Construction would also result in moderate adverse effects for residents of Poole Park Road, Furse Park, Savage Road, Hamoaze Avenue, Carlton Terrace, Church Way, North Prospect Road (north), Saltash Road (north), Wolseley Road (central and north), Royal Navy Avenue and Pemros Road respectively. Construction would also result in an additional further moderate adverse effect for train passengers.

### **Views During Year 1 of Operation**

The operation of the EfW CHP facility at Year 1 would result in a major significant adverse effect for some residents of Savage Road and Cardinal Avenue. Residents of Savage Road will benefit from views of the mitigation planting and Devon hedgebank in the foreground which will offset some of the adverse effect of the completed building behind. At this stage the new planting will not be mature and will therefore not create a screen but will filter the views experienced. Residents of the houses in Cardinal Avenue which directly overlook the site will experience more distant views of the completed facility but their wider panoramic views will still be afforded albeit that these will now incorporate the completed facility.

There would be major / moderate adverse effects for residents of Talbot Gardens, Hamoaze Avenue, Carlton Terrace and Saltash Road (north), although these effects will not be significant, as explained below.

At Talbot Gardens, the predominant views will remain the long distant panoramas across the Tamar estuary and Rame Peninsula to the south and west; the EfW CHP facility will be viewed obliquely. Residents will experience the return of Table Top Mountain to its original use (storage by the MoD) therefore their visual effect will have improved from the construction phase. Operation of the proposed development would therefore cause a noticeable but not a significant deterioration in the existing view.

From rear upper storeys (only) of the dwellings at the northern end of Hamoaze Avenue, the roof of the proposed building will be visible above the intervening railway embankment and fencing. This should be taken in the context of the existing wide views which face onto the Dockyard and distant Cornish landscape. The limited number of properties that would see the EfW CHP facility would experience a

noticeable deterioration but not a significant deterioration in the existing view. At the lower floors, and for properties at the southern end of this road, the views will remain unchanged of railings and the railway embankment in the immediate foreground.

The majority of properties on Carlton Terrace are oriented at an oblique angle to the site. The upper elements of the building will be visible as one element of the vast built forms of the dockyard which dominate the panoramic views. This will lead to a moderate but not significant deterioration in the existing view.

Views for properties on Saltash Road (north) are in the context of the wider dockyard panorama. The horizon of Barne Barton will largely be replaced with the proposed development, although the lower elements of the building will be set behind the existing dockyard buildings – there will be a noticeable but not significant deterioration in the existing view.

Operation would also result in moderate adverse effects for residents of Poole Park Road, Furse Park, Church Way, North Prospect Road (north), Wolseley Road (north and central), Royal Navy Avenue, Pemros Road, Wearde Quay, Maryfield Village, Coombe Park and Wilcove, Torpoint and Devonport respectively. There would also be a moderate adverse effect for train passengers.

### **Views At Year 15 of Operation**

There would still be visual effects of major significance for those residents of Cardinal Avenue whose properties look directly over the site. As for at year 1, mitigation planting will not lead to any reduction in the visual effect. It is predicted, however, that other development will also have taken place in the vicinity by Year 15 which is also likely to be large in scale and of an industrial nature and therefore complementary to the EfW CHP facility.

There would be major / moderate adverse visual effects for residents of Talbot Gardens, Savage Road, Hamoaze Avenue, Carlton Terrace, Saltash Road (north) respectively, although these effects will not be significant, as explained below.

At Talbot Gardens, the predominant views will remain the long distant panoramas across the Tamar estuary and Rame Peninsula to the south and west; the EfW CHP facility will be viewed obliquely. Operation of the proposed development would therefore cause a noticeable but not a significant deterioration in the existing view.

At Savage Road, the proposed mitigation planting will by year 15 form a significant buffer to the views from properties. This will result in a reduction in distant panoramic views but allow greatly reduced views of the proposed development thus reducing the adverse effect. This is therefore categorised as a noticeable deterioration but not a significant deterioration compared with the existing view.

From rear upper storeys (only) of the dwellings at the northern end of Hamoaze Avenue, the roof of the proposed building will be visible above the intervening railway embankment and fencing. This should be taken in the context of the existing wide views which face onto the Dockyard and distant Cornish landscape. The limited number of properties that would see the EfW CHP facility would experience a noticeable deterioration but not a significant deterioration in the existing view. At the lower floors, and for properties at the southern end of this road, the views will remain unchanged of railings and the railway embankment in the immediate foreground.

The properties on Carlton Terrace are oriented at an oblique angle to the site. The upper elements of the building will be visible as one element of the vast built forms of the dockyard which dominate the panoramic views. This will lead to a moderate but not significant deterioration in the existing view.

Views for properties on Saltash Road (north) are in the context of the wider dockyard panorama. The horizon of Barne Barton will largely be replaced with the proposed development, although the lower elements of the building will be set behind the existing dockyard buildings – there will be a noticeable but not significant deterioration in the existing view.

There would also be moderate adverse effects for residents of Poole Park Road, Furse Park, Church Way, North Prospect Road (north), Wolseley Road, Royal Navy Avenue, Pemros Road, Wearde Quay, Maryfield Village, Combe Park and Wilcove, Torpoint and Devonport respectively.

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## **Conclusion on Effects on Landscape and Views**

The iterative process of assessment and design has enabled the evolution of a scheme which is both functional in terms of its industrial purpose and pleasing in terms of its aesthetic appearance. The combination of built form, new landscape and management of existing landscape features will ensure that the scheme positively contributes to the townscape, landscape and biodiversity of the local environment. The design has evolved to be modern but functional: the facility will have a strong presence due to its nature, scale and form, but it will be carefully set within the landscape, its location and form, informed by the existing landform and natural features of the site and its immediate surroundings.

It is therefore considered that such details are appropriate and sufficient to overcome the adverse visual effects classified by the EIA methodology as significant. Overall, despite its visual prominence from some locations, it is therefore considered that the proposed scheme is compatible with its surroundings in terms of style, siting, layout, orientation, visual impact, local context and views, scale, massing, height, density, materials and detailing.

## **Ecology and Nature Conservation**

The impact of the proposed EfW CHP development on ecology and nature conservation has been assessed through desk study and site survey. Detailed surveys for habitats, reptiles, bats and breeding and wintering birds were carried out.

During construction, existing habitat of value to reptiles and the Black Redstart bird will be lost. However, these losses will be compensated for by the careful movement of the reptiles outside of the construction area in the appropriate season before construction commences and through the construction of a 'brown roof' on top of the new workshop building which will provide suitable Black Redstart habitat.

Two mature trees need to be felled as a result of the proposed development, but these have been surveyed and found to have negligible potential to support roosting bats; the loss is not considered to be significant. Tree felling and shrub clearance is to be undertaken outside of the bird nesting season or under the supervision of an ecologist.

There are expected to be beneficial effects on biodiversity through the enhancements and management proposed for Blackies Wood, including a new pond; the replacement of two existing culverts crossing Weston Mill Stream with a new clear span bridge; and the cleanup of existing general rubbish from the stream.

## **Cultural Heritage**

The potential impact of the proposed facility on cultural heritage has been assessed. Cultural heritage in this context comprises archaeological assets, the built heritage and the historic landscape. The assessment takes into account the value and significance of each cultural heritage feature and the likely impact of the proposed development upon them in order to arrive at a judgement of the significance of effects of the proposed development.

There will be no direct physical impacts on known archaeology and built heritage arising from construction and operation of the EfW CHP facility. Impacts would be limited to changes in the setting of archaeological and cultural heritage assets.

The proposed development would have an effect of minor adverse significance on the setting of the following four Scheduled Monuments: Mount Pleasant Redoubt, Battery at Wearde Quay, Civil war Breastwork at Inswork and Ballast Pond at Torpoint.

The proposed development would have a minor adverse effect on the setting of three Registered Parks and Gardens, namely Devonport Park, Mount Edgumbe Park and Antony Park.

The proposed development would have an effect of moderate adverse significance on the setting of four Grade II Listed structures, namely Building 124 (Mixing House) located approximately 200m west; and three buildings within HMS Drake, located approximately 300m south. The proposed development would have a minor adverse effect on the setting of a further three Grade II listed structures within HMS Drake.

The proposed development incorporates a comprehensive landscaping scheme which will minimise as far as possible effects on the setting of archaeological, built heritage and historic landscape features. The proposed development site is also well placed at the northern end of Devonport naval dockyard so that it is tucked at the narrow end of a natural valley and is partially screened by natural topography to the north and west and by the built environment to the east and south, including the railway embankment and viaduct, which will help to mitigate landscape setting issues. There is no specific cultural heritage mitigation required.

## Land and Water Quality

An assessment has been made of the existing land and water quality at the site, based on desk-based research and on-site sampling and chemical analysis conducted in 2010, and the potential impacts that could occur as a result of the proposed development.

Previous activities / land uses have led to some contaminants being present within the ground and groundwater, although there is not widespread contamination. Ground works will potentially expose these contaminants. However, the risk to nearby residents has been assessed as being very low, and the use by construction contractors of personal protective equipment, such as gloves and dust masks, during ground works will adequately protect their health and safety.

There is potential for contaminants exposed during ground works, or fuels / chemicals brought on to site and accidentally spilled, to pollute the nearby Weston Mill Stream and River Tamar. However, good site drainage, controls and working practices will be employed to greatly reduce the risks such that they are not expected to be significant.

Low levels of methane gas have been found in some of the samples taken during the ground investigation. It is most likely that these are derived from the decomposition of natural organic matter beneath the site – the site is on reclaimed land, formerly a creek. Ground works, in particular the drilling of piled foundations, may create ‘pathways’ for any ground gases present to rise up over time into the EfW CHP facility. However, further monitoring would occur during construction, and if required systems could be installed to collect and safely vent gas away from the building.

Overall, it is considered that provided appropriate measures are employed during each phase of the development, the proposed EfW CHP facility will not pose an increased risk to human health or the environment in terms of land and water quality.

## Water and Flood Risk

The site is located adjacent to Weston Mill Stream, which flows to Weston Mill Lake, a tidal water body connected to the Tamar Estuary.

The flood risk assessment demonstrates that the majority of the application site – including the entire central part of the site on which the EfW CHP facility will be constructed – is located within Flood Zone 1, land considered to have a low risk of flooding. A small section of land in the vicinity of the railway viaduct is located within Flood Zone 2 due to it being situated at a lower level. However, the section of new access road which will pass through this area will be built up slightly to mitigate for this.

The project will involve replacing the two existing access bridges over Weston Mill Stream, which are culverts, with a single clear-span bridge. The flood risk assessment demonstrates that this will have a negligible impact on flood levels upstream and downstream.

As the proposed development will result in an increase in the hardstanding area on site compared with existing conditions, surface water runoff from the site will increase. A surface water drainage strategy has been designed to manage the flow of water such that it neither poses a flood risk to the development itself nor to third parties off site.

A number of potential impacts could in theory occur to the nearby stream and groundwater as a result of the construction and operation of the proposed EfW CHP facility. Potential impacts include soil, silt, etc being washed into the stream during heavy rainfall and accidental spillage of fuels, chemicals, etc. However, by employing appropriate construction techniques and good design principles these risks will be successfully mitigated.

The significance of the identified effects and their likelihood of occurrence has been systematically evaluated and mitigation measures for each of the impacts have been identified. When taking into account the mitigation measures, all effects for the construction and operation of the proposed EfW CHP facility can be mitigated to a minor level or less. Furthermore, when taking into account the likelihood of such effects occurring, which in all cases is low or unlikely, the associated risks are reduced to low or very low.

## Traffic and Transport

A detailed traffic and transport assessment has been undertaken, including surveys of existing traffic movements on local roads / junctions and computer modelling of the potential traffic and transport impacts of the proposed EfW CHP facility.

The table overleaf summarises the expected daily vehicle movements associated with the facility. The table includes traffic arising from:

- Delivery of waste
- Delivery of chemicals required for the air pollution control system, etc.
- Dispatch of incinerator bottom ash and air pollution control residues
- Staff arriving and departing from work

'Two-way movements' means one heavy goods vehicle arriving at the facility and that same vehicle then leaving the facility.

The existing morning peak hour at the Camel's Head junction and on the northern access road to the Dockyard is between 07:00 and 08:00. The proposed EfW facility will not be open to receive waste deliveries until 08:00. The traffic and transport assessment shows that there is expected to be a negligible impact on the road links assessed. In the morning and afternoon peak hours (08.00 – 09.00 and 16.00 – 17.00) the increase in vehicles equates to 1% or less on the following road links:

- Weston Mill Drive – North of Carlton Terrace
- Weston Mill Drive – Between Carlton Terrace and Wolseley Road
- Wolseley Road – West of Weston Mill Drive
- Wolseley Road – Between Weston Mill Drive and Saltash Road
- Wolseley Road – East of Saltash Road
- Saltash Road – South of Wolseley Road

The greatest level of impact is expected to occur along the MoD's Northern Access Road, which will form the sole connection between the public highway network and the site access. Percentage impacts of 8.6% and 2.9% have been calculated for the morning and afternoon peak hours respectively. In real terms, this is equivalent to an increase in vehicle movements of 8 and 26 in the morning and evening peaks respectively, which is not significant and can be safely accommodated by the Northern Access Road.

**Table 1: Number of Vehicles Arriving at and Departing from the Facility Daily**

Time	HGV Two-Way Movements	Staff	Combined Total
05:00-06:00	-	5	5
06:00-07:00	-	5	5
07:00-08:00	-	9	9
08:00-09:00	18	11	29
09:00-10:00	20	0	20
10:00-11:00	34	0	34
11:00-12:00	32	0	32
12:00-13:00	24	0	24
13:00-14:00	30	5	35
14:00-15:00	46	5	51
15:00-16:00	30	4	34
16:00-17:00	16	9	25
17:00-18:00	12	7	19
18:00-19:00	2	0	2
19:00-20:00	-	0	0
20:00-21:00	-	0	0
21:00-22:00	-	5	5
22:00-23:00	-	5	5
<b>Total</b>	<b>264</b>	<b>70</b>	<b>334</b>

Three local road junctions have also been analysed. Both the Wolseley Road / Saltash Road junction and the Wolseley Road / Weston Mill Drive junction would continue to operate within their operational capacity thresholds with the additional traffic from the EfW CHP facility; the facility would make a marginal difference and queue lengths would be very similar. In the morning peak (08:00 to 09:00) the Weston Mill Drive / Carlton Terrace junction will also continue to operate within its operational capacity threshold with the additional traffic from the EfW CHP facility; again the facility would make a marginal difference and queue lengths would be very similar. In the afternoon peak (16:00 to 17:00) the Weston Mill Drive / Carlton Terrace junction is predicted by 2014 to operate slightly in excess of its design capacity even without the additional traffic from the EfW CHP facility; the facility would bring additional traffic but would make a marginal difference and queue lengths would be very similar. It is not considered that this is a significant effect.

## Air Quality

An air quality impact assessment has been undertaken, including taking air quality samples at a number of locations over a six month period, and computer modelling of emissions from the EfW CHP facility chimney and traffic both on the site and on adjoining roads leading to the site.

There are few existing significant sources of industrial emissions to air around the site. However, the proposed development is not far from a number of heavily trafficked roads, including the A3064 Wolseley Road / Weston Mill Drive.

A comprehensive suite of controls on emissions to air will be implemented as an integral part of the design of the EfW CHP facility, and the design of the facility incorporates Best Available Techniques in order to comply with the stringent requirements of the European Waste Incineration Directive.

The air quality modelling has established that a chimney in the range of 85 m to 95 m in height would deliver the required air quality mitigation benefit, without giving rise to other undesirable effects. Through the public consultation process, including exhibitions, MVV were made aware of some local residents' preference for air pollutants to be released from as tall a chimney as possible. The decision was taken by MVV to progress the design and the planning application based on a chimney height of 95 m above local ground level.

The combined impact of emissions to air from the EfW CHP facility chimney and from traffic movements both on the site and additional traffic movements on adjoining roads would not result in any significant effect at nearby residential properties, schools, hospitals or other locations.

Also, no significant air quality effects are predicted on designated ecological sites.

## Noise

Measurements of existing noise levels have been carried out in the area. Calculations have then been undertaken to assess the noise arising from the EfW CHP facility, the traffic servicing it, and the construction works, in order to assess the effects.

The construction contractor will follow best practicable means to minimise construction noise impacts upon the local community, including adherence to PCC's Code of Practice and applicable British Standards. Construction noise levels have been calculated at a representative set of residential properties. The assessment has shown that for the major part of the construction works, noise levels at surrounding properties will be below the proposed limits. However, for some construction activities, when working close to properties on Talbot Gardens, the noise limits will be exceeded for short durations. This will be mitigated where practical by the use of temporary noise barriers around noisy activities.

The EfW CHP facility has been designed to minimise operational noise levels as far as is practicable, through the selection of low noise plant items and the selection of wall cladding, roof cladding and ventilation openings to minimise noise breakout from the plant buildings. In addition a 3 m high acoustic fence will be installed along the access road. Operational noise levels have been calculated at a representative set of residential properties, employing a complex computer model of the proposed EfW CHP facility and the surrounding landform and buildings. The assessment shows that noise levels at nearby properties will achieve, or be below, the target noise levels, so the overall effects would be low to negligible.

## Construction Waste

An assessment has been undertaken to characterise the nature and likely amount of waste generated during the construction of the EfW CHP facility and the consequential environmental impacts. Kier, the civil engineering contractor, has produced a Site Waste Management Plan, which has calculated the types and amounts of construction waste and whether the waste will be re-used, recycled or sent to landfill. The intention is to manage waste as high up the Waste Hierarchy as possible. It is expected that the majority of the waste arising will be re-used on site or sent off site for recycling. Only small quantities are likely to be sent for disposal to landfill. Any hazardous waste arising will be dealt with by a specialised hazardous waste operator. No significant environmental effects are envisaged.

## Daylight, Sunlight and Overshadowing

An assessment has been undertaken of the impacts of the proposed EfW CHP facility on the daylight and sunlight levels received by existing neighbouring properties and the levels of shadow experienced within

existing woodland and amenity space and proposed landscaping within the site. The assessment concluded that the proposed development will not result in any unacceptable impacts in relation to daylighting, annual and winter sunlight availability and overshadowing. The proposed development complies with the relevant guidelines published by the Building Research Establishment.

## Economy

### Background

Plymouth has a distinctive economy and history, based largely on its seafaring tradition and strong links with the military. The maritime and defence sectors continue to play a significant role in the local economy. As with many other areas of the economy these sectors have come under increasing pressure due to the recession, public expenditure cuts and subsequently have experienced job losses. In recent years Plymouth has continued to diversify its economic base and developed a local strategy to focus on six priority sectors including advanced engineering, marine and renewables, business services, creative industries, health and medical, and tourism and leisure.

The Plymouth economy under-performs on a range of measures, notably Gross Value Added (GVA), where performance is below the regional and national averages. This is due to the sectoral mix of the economy; particularly the high dependence on the public sector, poor productivity levels in other sectors, lower levels of participation in the labour market and a low level of new business creation. The Plymouth economy has made significant progress over the past ten years with its performance improving on a range of different metrics. This includes an improved performance on the skill levels within the workforce, an increase in the number of new businesses and an improvement in the economic dynamism of the Plymouth economy as a whole. Having said this, Plymouth still lags behind many of the key towns and cities in the South West.

To address this gap in economic performance requires a series of measures including sustaining the increasing numbers of new business starts and new employment, securing high-value added sector growth, improving the productivity of existing businesses and maintaining and diversifying the industrial base particularly where there are opportunities to exploit the potential of climate change and low carbon markets and technologies.

### Job Creation

MVV and its contractors have made detailed estimates of the construction costs of the project, a proportion of which will comprise labour costs. There will be approximately 309 construction workers on-site during the peak (October 2013) of construction activity.

MVV has also calculated that the operational phase will generate 33 full-time jobs. The following posts will be created: Financial Director, Technical Director, Administrator / Receptionist, Community Liaison Manager, Contract Manager, Financial Manager, Energy Manager, Health, Safety and Environmental Manager, Operations Engineer, Maintenance Engineer, Tipping Hall Supervisor / Weighbridge operator, Shift Team Leaders (control room), Plant Operators, Crane Operators, Consumables & Residues Operator, Mechanic, and Electrician.

### Other Economic Benefits

There are a range of important benefits which the EfW CHP facility is expected to bring to the Plymouth and local neighbourhoods, including:

- By offering an alternative to landfill the EfW CHP facility will help to significantly reduce the cost of waste disposal for the SWDWP authorities. Evidence suggests that savings generated through the use of the EfW CHP facility would amount to £60M less than the landfill alternative, over the 25-year lifetime of the contract. In addition the partner authorities will receive a PFI grant worth £177M.
- Savings on energy costs and reduced carbon emissions for the naval base and dockyard, and in future potentially other businesses.
- Supplying heat to the proposed Help for Heroes swimming pool for injured armed forces personnel.

- Safeguarding and creating further employment in the dockyard.
- MVV and Kier will actively promote and assist City College Plymouth, the University of Plymouth and other institutions to recruit and support through work placements and internships future apprentices, undergraduates and graduates.
- Potential future roll-out of district heating and reduced expenditure on energy for low income households in neighbourhoods close to the proposed development, alongside other sustainable energy projects being promoted by Plymouth City Council.

It is considered that the proposed development would have an overall beneficial impact on Plymouth and the South West's economies, through a range of different effects including new employment, supply chain benefits, increased local income, cost savings to businesses, households and the MoD, alongside wider carbon savings. The proposed development will also have beneficial impacts on land use.

## Health and Well-being

It is widely perceived that the EfW CHP facility could potentially impact on the health and well-being of local communities, which are directly associated with air quality, noise and traffic.

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

The health and well-being assessment conducted by Scott Wilson for the proposed EfW CHP facility shows that emissions to air would not result in a significant impact at residential properties, schools, hospitals or other locations. The assessment of the effect of the emissions on human health, using the Department of Health Committee on the Medical Effects of Air Pollution (COMEAP) assessment methods, has demonstrated that predicted impacts do not represent a significant health risk to the local population.

The construction and operation of the EfW CHP facility also are perceived to have the potential to impact on the social determinants of mental well-being. Various aspects of the proposed development itself and of MVV's ethos seek to have a reassuring impact on well-being. These measures include those to reduce the impact of emissions to air, noise and traffic as far as possible, and the establishment of a Local Liaison Committee.

## Cumulative Effects

### **Cumulative Effects of EfW CHP Facility**

The way that the effects of the proposed EfW CHP facility have the potential to combine together to cause 'cumulative' effects with one another at certain sensitive locations and lead to significant effects has also been assessed.

For the residents of properties on Talbot Gardens, there would throughout the construction period be a significant visual effect due to direct views over the construction compound. There may be short term occasions during construction when there are also dust and noise impacts, which for these short term periods could combine to cause significant cumulative effects, although this would be expected for any construction project.

For the residents of properties 91-138 Savage Road, again there may be short term occasions during construction when there are dust and noise impacts, which for these short term periods could combine to cause significant cumulative effects, although this would not be unexpected for any construction project.

These effects are estimated to be short term, mainly during construction, and no other properties are expected to experience significant cumulative effects.

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### **Cumulative Effects with Other Proposed Development Projects**

The potential for effects of the EfW CHP facility to combine with effects from other proposed development projects in the vicinity and lead to significant effects has also been assessed.

Both the proposed EfW CHP facility and the proposed Devonport Landing Craft Co-location Project (DLCCP) commit to cleaning up litter, rubble, etc in Weston Mill Stream so there are expected to be some beneficial cumulative effects on ecology in this respect.

The construction periods for the proposed EfW CHP facility, Help for Heroes accommodation block, proposed Help for Heroes rehabilitation centre and the proposed DLCCP project are likely to overlap for a time during 2012. Additional traffic in the Camel's Head area can therefore be expected during this period. A Framework Construction Staff Travel Plan has been prepared and efforts will be made to minimise as far as possible construction traffic effects resulting from the EfW CHP facility through the use of off-site parking for construction staff at the Goschen Yard and busing staff to the site.

Operational traffic from the proposed EfW CHP facility, the proposed DLCCP and the proposed Weston Mill District Centre have been modelled in the traffic and transport assessment. The Weston Mill Drive / Carlton Terrace junction is currently operating over its design capacity and all three projects would cause additional traffic to pass through this junction. The contribution of the proposed EfW CHP facility traffic would be low.

The various proposed developments will bring new facilities and jobs to the area so in combination there are considered to be significant beneficial cumulative effects in this respect.