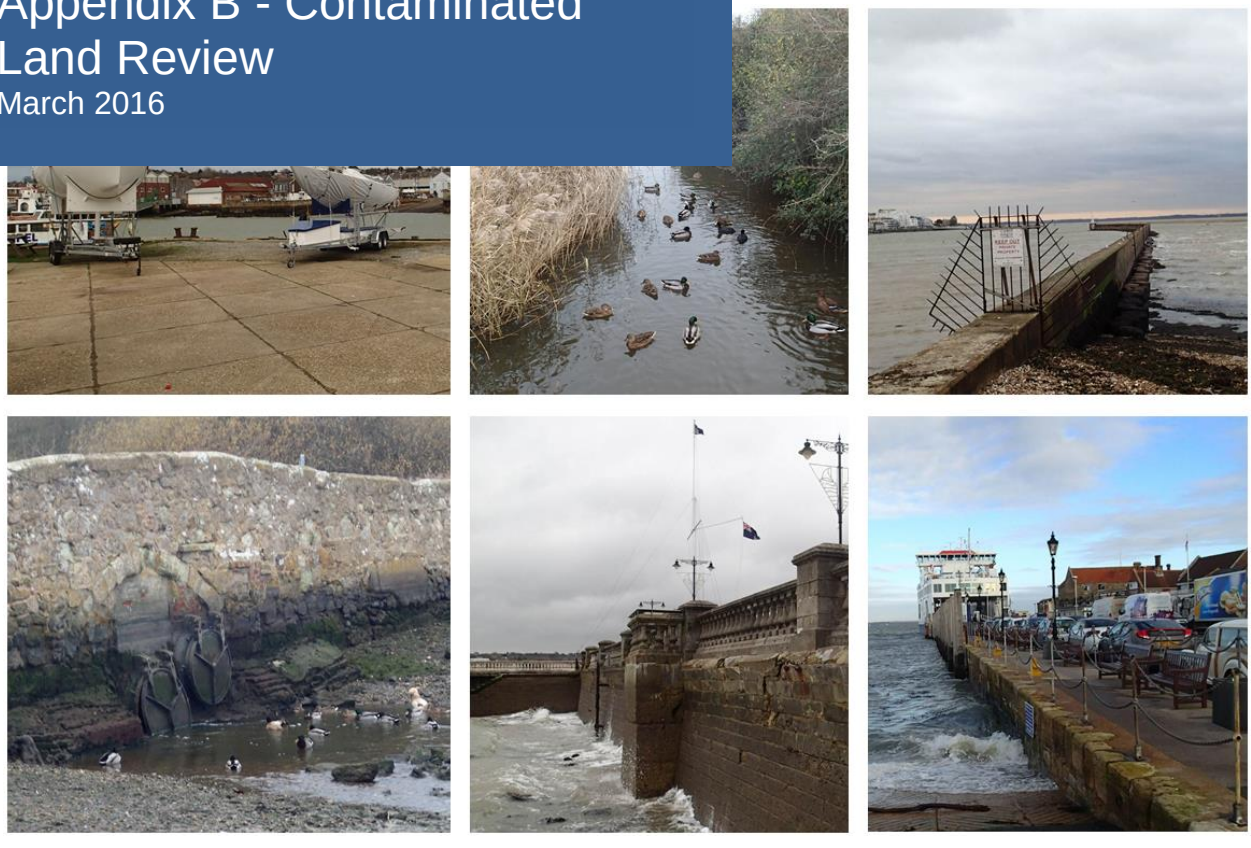
CAPITA | AECOM

Water and Environment Management Framework
Lot 3 – Engineering and Related Services

West Wight Coastal Flood and Erosion Risk Management Strategy

Appendix B - Contaminated Land Review

March 2016



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Document overview

Capita | AECOM was commissioned by the Isle of Wight Council in October 2014 to undertake a Coastal Flood and Erosion Risk Management Strategy. As part of this commission, a contaminated land review is required in order to determine the potential contamination issues that need to be considered as part of the strategy.

Document history

Version	Status	Issue date	Prepared by	Reviewed by	Approved by
1	Draft for comment	6th February 2015	Jason Drummond – Principal Flood and Coastal Specialist George Batt – Graduate Coastal Engineer	Helen Culshaw – Senior Hydrogeologist	Tara-Leigh McVey Associate
2	Revision after client comments	27th February 2015	George Batt – Graduate Coastal Engineer	Jason Drummond – Principal Flood and Coastal Specialist	Tara-Leigh McVey Associate
3	Revision after further client comments	4th August 2015	George Batt – Graduate Coastal Engineer	Jason Drummond – Principal Flood and Coastal Specialist	Tara-Leigh McVey Associate
4	Revision after further client comments	18th December 2015	Ben Taylor – Graduate Coastal Engineer	Jonathan Short – Senior Coastal Specialist	Tara-Leigh McVey Associate
5	Update for consultation & Final	March 2016	Ben Taylor Assistant Consultant	Jonathan Short – Principal Consultant	Tara-Leigh McVey Associate

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The methodology adopted and the sources of information used by Capita | AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken between December 2014 and January 2015 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.

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1. Introduction

1.1 Project Background

Capita | AECOM has been appointed by the Isle of Wight Council (IWC) to develop a coastal flood and erosion risk management strategy for West Wight, between Freshwater Bay westward along the coast to East Cowes. The strategy will evaluate options for managing coastal flooding and erosion, including potential maintenance and capital works required. The strategy option assessments will be based on technical issues, economics, stakeholder interests, and environmental impacts.

Following a thorough evaluation of these different aspects, the strategy will develop sustainable and adaptable coastal defence options with preferred implementation plans put forward. These options will reference the preferred policies outlined in the Isle of Wight Shoreline Management Plan 2 (SMP2) published in 2010. The SMP2 was adopted by the Isle of Wight Council and the Regional Flood Defence Committee in December 2010; formal Environment Agency approval followed in May 2011.

1.2 Purpose of the Document

This document details the findings of a land contamination data desktop study undertaken by Capita | AECOM for the West Wight strategy area; the available data has been reviewed to identify contaminated land that will need to be considered in the West Wight Coastal Flood and Erosion Risk Management Strategy, herein referred to as “the Strategy”.

Contaminated land needs to be addressed in the Strategy because there is potential for the strategy management decisions to have either a positive or negative influence on issues regarding contamination. For example, the implementation of new defences along a currently eroding contaminated shoreline can remove a pollution hazard by blocking the pathway that in the future would link a source (e.g. a landfill site) to a receptor (e.g. an environmentally sensitive habitat). Conversely, following a policy of ‘No Active Intervention’ may allow a contamination issue caused by flooding or erosion to continue or to be introduced. These issues must therefore be recognised and risks assessed to develop potential options.

No intrusive surveys or material testing has been carried out as part of the assessment. The desktop study has been based on a review of available data and information provided by IWC and/or held in the public domain.

The indicative risk levels attributed to sites are provided purely in relation to the Strategy for the purpose of highlighting key issues for option development, and should not be used in any other context. It should also be noted that although certain sites along the frontage have been identified as being potentially contaminated, no sites have been formally designated as ‘Contaminated Land’ at present.

Further detailed studies and intrusive surveys would be required to confirm if these potentially contaminated sites would meet the statutory definition of contaminated land.

Due to the indicative and strategic level nature of the desktop findings, and due to potential sensitivities or misinterpretation of sensitive information, no mapping of sites has been undertaken; rather potential sites have been signposted in each Policy Unit (Section 7) and this information has been considered in the appraisal of Strategy options.

2. Contaminated Land

2.1 Definition

Contaminated land is defined in section 78A(2) of Part 2A of Environmental Protection Act 1990. With the issue of the new Statutory Guidance (2012) the definition has been modified to include the significant pollution of controlled waters:

"Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

- Significant harm is being caused or there is a significant possibility of such harm being caused; or
- Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused."

Contamination of land arises primarily from industrial processes, accidents or spills of contaminants, waste disposal and leaking underground storage tanks. If not dealt with adequately it can pose a threat to human health, the environment and sustainable economic development.

In this context, the Government's objectives with respect to contaminated land are:

- To identify and remove unacceptable risks to human health and the environment;
- To seek to ensure that contaminated land is made suitable for its current use;
- To ensure that the burdens faced by individuals, companies and society as a whole are proportionate, manageable and compatible with the principles of sustainable development.

The risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. In recognition of this, the Government considers a 'suitable for use' approach in dealing with contaminated land to be the most appropriate. This consists of four elements and is the basis of the current UK legislation dealing with contaminated land:

- Ensuring that the land is suitable for its current use;
- Ensuring that land is made suitable for any new use, as official permission is given for that new use;
- Limiting requirements for remediation work in relation to the current use;
- Future use of the land.

2.2 Assessing Risk

Part 2A takes a risk-based approach to defining contaminated land. "Risk" means the combination of: (a) the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land; and (b) the scale and seriousness of such harm or pollution if it did occur. For a receptor to be at risk there needs to be a pathway between it and the source of the risk (contaminant).

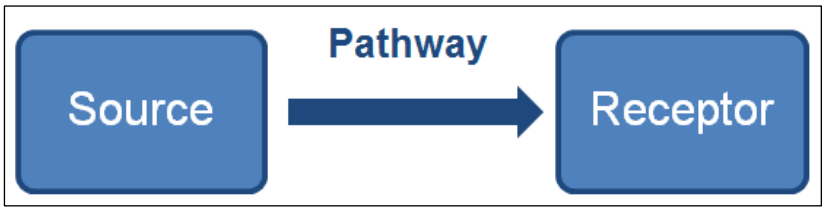

Figure 2-1: Risk Model (adapted from CIRIA C718)

Therefore the contamination linkage consists of three parts (Figure 2-1):

- The ***source*** is a substance which is in, on or under, the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters;
- A ***pathway*** is a route by which a receptor is, or might be, affected by a contaminant;
- A ***receptor*** is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property or controlled waters.

3. Methodology

The following chapter summarises the methodology used in the desktop contaminated land assessment.

3.1 Data Collection and Review

The initial stage of this desktop study was the collection of relevant available data. A review of available land contamination records, made available to Capita | AECOM by IWC, was undertaken in order to develop a baseline understanding and establish the key issues and areas of potential contamination.

3.2 Scoping Relevant Sites

The land contamination data acquired from IWC was compiled within a geographic information system (GIS) and assimilated alongside indicative erosion mapping and flood mapping to identify the potentially contaminated sites at risk due to these processes in the future.

A 50 m buffer was applied to the edges of the erosion and flood zones. The reasoning for this is that the zones are only predictions of future scenarios and the buffer results in a more conservative approach that reduces the likelihood of potential future sources of contamination being overlooked.

The potentially contaminated sites that did not fall within the buffer of the erosion lines or flood zones were at this stage scoped out as they are not relevant to the Strategy. All other remaining sites along the frontage, i.e. scoped in, are assessed in Section 7.

3.3 Establishing Potential Receptors and Pathways

In order to establish the potential contamination risks using the source, pathway, receptor model, the identification of relevant potential receptors along the Strategy frontage was undertaken using the available GIS data. Understanding the potential pathways that the Strategy might remove or introduce is also important to inform option development. For example, a diversion channel might newly expose a receptor to flooding.

3.4 Risk Assessment of Relevant Sites

This report is intended to provide ‘signposting’ of key issues regarding potential contamination areas for the Strategy. The focus has therefore been on the identification of significant contamination issues, rather than specific details of minor contaminants found at localised sites. In the absence of comprehensive detailed contaminated land studies for the frontage, this assessment has relied heavily on former and current land use data to infer potential contamination risk.

The process of identifying potential contamination issues for the Strategy was one of spatial analysis considering sites where pollution sources may be present, the possible pollutant pathways relevant to the Strategy (i.e. coastal processes), and potential receptors.

Through this process an indication of the potential risk of specific sites has been obtained and reported. A discussion of significant issues has been provided in the context of the Strategy. Any recommendations for further work or consideration in the development of Strategy options have also been included.

4. Data Review

4.1 Source Data

In the absence of comprehensive detailed contaminated land studies for the frontage, this assessment has relied heavily on former and current land use data to infer potential contamination risk. Contaminated land sites have been identified and mapped by IWC officers reviewing historic maps and were supplied to Capita | AECOM through GIS layers (the contaminated land layers used to identify sites of contamination were historic landfill sites and potentially contaminating landuses). This was checked against publicly available data from the Environment Agency 'What's in your backyard?' website on landfill and pollution and no data gaps were identified.

The landfill data includes the name of the site, licence holder, licence issue data, where applicable licence end date and details of the type of waste. The potentially contaminating land uses data includes a brief description of land use e.g. works, boat yard, industrial unit etc.

4.2 Receptor Data

Receptor data includes information on environmental assets and designations, human, key assets and water, namely: OS Mastermap data showing property and residential/commercial land uses and a GIS layer of environmentally designated sites from IWC. Information on groundwater source protection zones and aquifer locations was obtained from publically available data from the Environment Agency.

4.3 Pathway Data

In order to establish the relevance of potentially contaminated sites for the Strategy, data relating to erosion and flood zones have been used.

Indicative erosion zones (from the present day to 2025, 2025-2055, 2055-2115) produced by the Isle of Wight Council have been applied in this study. These erosion zones assume a scenario of 'No Active Intervention', (i.e. allowing existing defences to fail and coastal change to occur; or where no defences are present, natural change of the coastline will continue). In addition, the possible landslide reactivation zone along Cowes-Gurnard leading to 2 m/yr retreat has been applied.

Flood zones have been established using the latest modelling available (JBA Consulting, 2015). The 'worst case' scenario has been used – a 1 in 1,000 year flood zone in 2115, using existing defence crest heights. Note that for some locations only flood modelling outputs from the SMP2 study were available – these locations were Fort Albert and the Newtown Estuary.

5. Potential Contamination Receptors

The following section provides an overview of relevant potential receptors within the West Wight strategy area. The guidance (CIRIA C718) gives a list of receptors, which are summarised as:

- Human beings;
- Property in the form of animals or crops;
- Ecological systems or living organisms forming part of a system within certain protected locations e.g. Sites of Special Scientific Interest, property in the form of buildings as defined by the Town and Country Planning Act 1990;
- Controlled waters (including surface waters, principal and secondary aquifers) and drinking source protection zones.

5.1 Human Beings and Property

Human beings are an imperative consideration as potential receptors in all assessments of contamination risk.

Newport and Cowes/East Cowes are the most populated areas within the West Wight Strategy area with populations of approximately 24,000 and 17,000 respectively; other towns include Yarmouth, Totland and Freshwater. This means a significant population exists within the Strategy area that could potentially be affected by a contamination source if a relevant pathway links a source to this receptor.

There is also a large amount of farmland in the West Wight Strategy area.

5.2 Ecological Systems

The West Wight Strategy area includes a number of important designated environmental sites. Several of these sites are located close to the coastline and so could be subject to erosion and flooding and are potential receptors to contamination.

Table 5-1 shows the environmentally important sites that fall within the flood and erosion zones.

Table 5-1: Environmentally Designated Sites within the Strategy

Importance	Site Name
Special Areas of Conservation (SAC)	Solent Maritime
	Isle of Wight Downs
	South Wight Maritime
Special Protection Area (SPA)	Solent & Southampton Water
Ramsar	Solent & Southampton Water
Site of Special Scientific Interest (SSSI)	Headon Warren & West High Down

	Lacey's Farm Quarry
	Colwell Bay
Site of Special Scientific Interest (SSSI)	Yar Estuary
	Freshwater Marshes
	Bouldnor & Hamstead Cliffs
	Newtown Harbour
	Thorness Bay
	Medina Estuary
National Nature Reserve	Newtown Harbour
Local Nature Reserves	Afton Marshes
	Dodnor Creek and Dicksons Copse

5.3 Controlled Waters

Groundwater Source Protection Zones (SPZs) are for groundwater sources such as wells, boreholes and springs used for public drinking water supply. The zones are used to show risk of contamination from any activities that might cause pollution in the area. In the strategy area there are Source Protection Zones in:

- Freshwater Bay;
- Southwest Newport;
- Cowes.

Aquifers are underground layers of water-bearing permeable rock or drift deposits from which groundwater can be extracted. Principal aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. Secondary aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. In the strategy area there are principal aquifers located:

- Along the frontage from the Needles to Freshwater Bay; and
- South Newport.

Secondary aquifers cover the majority of the strategy area including:

- Freshwater Bay;
- Yarmouth;
- The banks of the River Yar;
- Cowes;

- The banks of the River Medina; and
- Newport.

6. Potential Contamination Pathways

A pathway is a route by which a receptor is, or might be, affected by the source of contamination. The CIRIA guidance on management of landfill sites on eroding coastlines (CIRIA C718) highlights that erosion can cause previously non-exposed waste to be released, and fall down the face of the cliff top. Likewise, flooding can cause the wash-out of potentially hazardous waste from contaminated land.

6.1 General Pathways

Humans on site

- Direct exposure via dermal absorption with any contaminants in soil, groundwater or dust;
- Direct exposure by ingestion of any contaminates in soil, groundwater or dust;
- Indirect pathways via ingestion of contaminants in groundwater by consumption as potable supply.

Humans off site

- Contaminants from the sites have to reach the location of off site human receptors before an exposure pathway can be deemed to be present and evaluated further. The primary pathways include airborne dust or fibres, landfill gas, surface water run-off and groundwater.

Waters

- Groundwater resources could form a potential pathway to link contaminants to receptors, whilst also being receptors in their own right;
- Coastal waters and rivers could form potential pathways linking contaminants to receptors, whilst also being receptors in their own right.

Ecological Systems

- Direct exposure via contact with any contaminants in soil, groundwater or dust;
- Direct exposure by ingestion of any contaminants in soil, groundwater or dust;
- Indirect pathways of contamination in plants by consumption.

Property: In the form of animals or crops

- Direct exposure via contact with any contaminants in soil, groundwater or dust;
- Direct exposure by ingestion of any contaminants in soil, groundwater or dust.

6.2 Strategy Impacts on Source-Receptor Linkages

The Strategy can either **introduce new pathways or increase the existing pathways** linking sources to receptors through:

Erosion causing:

- Direct exposures;
- Leaching;
- Sediment transport.

Flooding causing:

- Leaching;
- Run-off;
- Increased groundwater storage potential.

There are a number of ways in which the Strategy can **reduce and/or prevent linkages** between sources to receptors such as:

- Maintaining defences to continue protection against erosion and reduce the susceptibility to flooding;
- Implementing new defences to prevent areas from eroding or to reduce the erosion rate and to prevent flooding;
- Capping sites;
- Remedial work by actively removing or treating the contamination source.

The Strategy also has the potential to **introduce or increase linkages** between sources and receptors through:

- Continuing to recommend 'No Active Intervention' (as per the SMP2) allowing erosion and/or tidal flooding;
- Realigning or setting back current defences exposing contaminants;
- Allowing the current standard of protection against tidal flooding to reduce, increasing the leaching potential;
- The creation of new preferential pathways through the excavation of foundations for proposed defences.

7. Risk Assessment of Contamination Sites

7.1 Context

A review of the available data shows that a variety of contamination sources exist along the frontage. Using the Source-Pathway-Receptor model discussed in Section 2.2 the potential contamination sources at various sites within the Strategy frontage have been assessed. This is a high level assessment that has used the available data to make a judgement of the contaminated risk in the various Option Development Units of the Strategy coastline.

Please note that this assessment was carried out under the assumption that the SMP2 management policies would be adopted in the future management of the coastline, to inform the Strategy development. Since undertaking this assessment, the preferred options for the Strategy have been developed. In some instances these options differ in approach to the SMP policy, and where this is the case an additional assessment of the impacts to contamination sites of the preferred options has been undertaken. This additional assessment is described in Addendum 1, at the end of this report.

The desktop assessment has classified relevant sites and used the following categories relating to their priority and contamination risk within the context of the Strategy:

High Risk – these are defined by one or more of the following:

- Based on former land use, those sites that are likely to contain significant contamination sources that are currently linked, or are likely to become linked to receptors e.g. humans or designated habitats, via coastal processes such as coastal erosion or tidal flooding;
- High risk sites along the frontage confirmed from previous studies/reports.

Low Risk – these are defined by one or more of the following:

- Based on former land use, those sites that could potentially contain contamination sources but are not currently linked to receptors e.g. humans or designated habitats, but could potentially become linked in the future via coastal processes such as coastal erosion or tidal flooding;

7.2 Sites

7.2.1 Tennyson Down, Alum Bay and Headon Warren (W1)

- Source – A fort, historic signal station, disused test sites and batteries, a coastguard station, disused chalk pit and historic reservoirs have all been identified as potentially contaminated.
- Receptors – This unit is a SAC and SSSI.
- Pathway – These sites are all within the erosion zone. The adopted SMP2 policy in this unit is ‘No Active Intervention’.

- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are no formal defences present and implementing the adopted SMP2 policy will result in these sites eroding. Therefore, before these sites do erode further investigation of what contamination is present should take place to assess the consequences.

7.2.2 Southern and Central Totland Bay (W2)

- Source – Two historic life boat houses, historic electricity substation and coastguard station have all been identified as potentially contaminated.
- Receptors – This unit is not environmentally designated.
- Pathway – The historic life boat house is within the flood and erosion zones. The other sites are only within the erosion zone. The adopted SMP2 policy in this unit is 'Hold the Line'.
- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of the historic life boat house in the flood zone; sustaining or improving the standard of protection of the existing defences would reduce this risk. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.3 Northern Totland Bay (W3)

- Source – A disused battery has been identified as potentially contaminated.
- Receptors – This unit is a SSSI.
- Pathway – The site is within the erosion zone only. The adopted SMP2 policy in this unit is 'Hold the Line'.
- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The site is thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.4 Southern Colwell Bay (W4)

- Source – A disused gravel pit.
- Receptors – This unit is a SSSI.

- Pathway – The site is within the erosion zone only. The adopted SMP2 policy in this unit is 'Hold the Line'.

- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The site is thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.5 Central Colwell Bay (W5)

- Source – A historic rifle range has been identified as potentially contaminated.

- Receptors – This unit is a SSSI.

- Pathway – The site is within the erosion zone only. The adopted SMP2 policy in this unit is 'No Active Intervention'.

- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The site is thought unlikely to contain significant sources of contamination. There are no formal defences present and implementing the adopted SMP2 policy will result in this site eroding. Therefore, before this site erodes further investigation of what contamination is present should take place to assess the consequences.

7.2.6 Fort Albert (W6)

- Source – A historic battery and rifle range and fort have been identified as being potentially contaminated.

- Receptors – This coastline is not environmentally designated.

- Pathway – The fort and part of the rifle range are within the flood and erosion zones. The other sites are only within the erosion zone. The adopted SMP2 policy in this unit is 'Hold the Line' to 2055; beyond this it changes to 'No Active Intervention'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway until 2055 if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. Any proposals to introduce new flood defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more

detailed assessment of the contaminated risk should be undertaken. If it is implemented the assessment should take place before changing to 'No Active Intervention'.

7.2.7 Fort Victoria Country Park (W7)

- Source – A disused reservoir, historic military land and part of a rifle range (also in W6) have been identified as potentially contaminated.
- Receptors – This coastline is not environmentally designated.
- Pathway – The sites are within the erosion zone only. The adopted SMP2 policy in this unit is 'No Active Intervention'.
- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are no formal defences present and implementing the adopted SMP2 policy will result in these sites eroding. Therefore, before these sites do erode further investigation of what contamination is present should take place to assess the consequences.

7.2.8 Fort Victoria and Norton (W8)

- Source – A fort, historic military land, made ground, a historic pond, a historic boat builders, a historic pier, a historic slipway and a historic boat house have been identified as being potentially contaminated.
- Receptors – Part of the coastline in this unit is a SAC.
- Pathway – The made ground and pond are within only the erosion zone. The other sites are within both the erosion and flood zones. The adopted SMP2 policy in this unit is 'Hold the Line' to 2025; beyond this it changes to 'No Active Intervention'.
- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway until 2025 if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken. If it is implemented, this assessment should take place before changing to 'No Active Intervention'.

7.2.9 Norton Spit (W9)

- Source – A historic marina and a boat yard have been identified as potentially contaminated.

- Receptors – This unit is a Ramsar, SAC, SPA and SSSI; other receptors would be humans using the River Yar.

- Pathway – The sites are within both the flood and erosion zones. The adopted SMP2 policy in this unit is 'Hold the Line'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are currently hard and soft defences (i.e. a breakwater, sand spit) that will assist in removing the potential for erosion if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. Any proposals to introduce new flood defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.10 Western Yar Estuary – western shore (W10)

- Source – Historic industrial buildings including a gas works, a gasometer, a boat yard, a historic landfill site, historic pond and a grave yard have been identified as potentially contaminated.

- Receptors – This unit is a Ramsar, SAC, SPA and SSSI; other receptors would be humans using the River Yar.

- Pathway – The sites are within the flood zone only. The adopted SMP2 policy in this unit is 'No Active Intervention'.

- Assessment: High risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The landfill site is described as containing commercial, industrial and household waste. There are currently defences in front of some of the sites, whilst other sites are undefended. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk, however the adopted SMP2 policy is 'No Active Intervention'. It is known that part of the site is capped and the rest is currently flooded in a 1:1yr present day event – there have been no negative consequences reported, which suggest no remedial works are required at this time. Any proposals to introduce new flood defences across this landfill should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary.

7.2.11 The Causeway (W11)

- Source – A historic sewage pumping station, historic ponds, a council yard, a garage, a coal yard, a historic railway station, a works and a disused gravel pit have been identified as potentially contaminated.

- Receptors – This unit is a Ramsar, SAC, SPA and SSSI; other receptors would be humans using the River Yar.

- Pathway – The sites are within the flood zone only. The adopted SMP2 policy in this unit is 'Hold the Line'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. Any proposals to introduce new flood defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.12 Freshwater Bay (W12)

- Source – A boat house, water works house, depot and disused quarries have been identified as potentially contaminated.

- Receptors – Freshwater Bay is a SAC, the Freshwater/Afton Marshes are a SSSI.

- Pathway – The boat house is located in the flood and erosion zones, the other sites are only within the flood zone. The adopted SMP2 policy in this unit is 'Hold the Line'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. Any proposals to introduce new flood defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.13 Western Yar Estuary – eastern shore (W13)

- Source – Two historic ponds have been listed as potentially contaminated.

- Receptors – This unit is a Ramsar, SAC, SPA and SSSI; other receptors would be humans using the River Yar.

- Pathway – The sites are within the flood zone only. The adopted SMP2 policy in this unit is 'No Active Intervention'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk, however the adopted SMP2 policy is 'No Active Intervention'. If the adopted SMP2 policy is implemented the sources will continue to be linked to the receptors.

7.2.14 Thorley Brook and Barnfields Stream (W14)

- Source – Multiple ponds, a grave yard, disused corn mill, disused gas works, historic railway station, sewage tanks, fires station, pumping station and works have been identified as potentially contaminated.

- Receptors – This unit is a Ramsar, SAC, SPA and SSSI; other receptors would be humans using the River Yar.

- Pathway – The sites are within the flood zone only. The adopted SMP2 policy in this unit is 'Hold the Line' to 2025; beyond that it changes to 'Managed Realignment' to 2055, and then 'No Active Intervention' after.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. Any future managed realignment as suggested by the SMP2 will have to consider these potentially contaminated sites. Any proposals to introduce new flood defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.15 Thorley Brook to Yar Bridge (W15)

- Source – A historic smithy, a boat builders, made ground, a car park and a historic landfill site have been identified as potentially contaminated.

- Receptors – This unit is a Ramsar, SAC, SPA and SSSI; other receptors would be humans using the River Yar.

- Pathway – The garage, boat builders, made ground and historic smithy are only within the flood zone. The historic landfill site and car park are within the flood and erosion zones. The adopted SMP2 policy in this unit is 'Hold the Line'.

- Assessment: High risk. These sites are potentially contaminated (most notably the historic landfill site), no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is followed. Sea

level rise could lead to an increased frequency of tidal flooding of these sites. Sustaining or improving the standard of protection of the existing frontline defences would reduce this risk, but alternative setback flood defences may not (depending upon the defence alignments). If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken. Any proposals to introduce new flood defences should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary.

7.2.16 Yar Bridge to Yarmouth Common (W16)

- Source – A depot, marine engineering works, car ferry terminal, historic quay and slipway and jetties have been identified as potentially contaminated.
- Receptors – This unit is a SAC; other receptors would be humans using the River Yar.
- Pathway – The depot is only within the flood zone. The other sites are within the flood and erosion zones. The adopted SMP2 policy in this unit is 'Hold the Line'.
- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. Setback flood defences may provide a reduced level of protection against contamination sources, and any proposals to introduce new flood defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.17 Yarmouth Common to Port la Salle (W17)

- Source – A cemetery, disused pits, a boat house, a historic quay, a boat house and a historic landfill site have been identified as potentially contaminated.
- Receptors – This unit is a SAC.
- Pathway – The cemetery and disused pits are only within the erosion zones. The other sites are within the flood and erosion zones. The adopted SMP2 policy in this unit is 'Hold the Line'.
- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination – the landfill site is listed as inert. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. Although erosion is the key risk in this unit, sea level rise could lead to an increased

frequency of tidal flooding; sustaining or improving the standard of protection of the existing defences would reduce this risk. Any proposals to introduce new defences in this unit should include a more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.18 Bouldnor Copse and Hamstead (W18)

- Source – A historic jetty, disused pier, historic brick works and kiln, multiple ponds and two historic landfill sites (one is also listed as a disused pit) have been identified as potentially contaminated.
- Receptors – This unit is a SAC, SSSI and NNR.
- Pathway – The historic jetty, ponds and historic pier are only within the flood zone. The historic brick works and kiln are within the flood and erosion zones. The two disused landfills are only with the erosion zone. The adopted SMP2 policy in this unit is 'No Active Intervention'.
- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The landfill sites are listed as inert. The sites are thought unlikely to contain significant sources of contamination and most sites are undefended. Implementing the adopted SMP2 policy will result in these sites eroding and sea level rise could lead to an increased frequency of tidal flooding of these sites. Therefore, before these sites do erode further investigation of what contamination is present should take place to assess the consequences.

7.2.19 Newtown Estuary (W19)

- Source – Historic quay and pier, sewage disposal unit, ponds, historic quays, historic salt works, mill, historic saw pit, disused rifle ranges, historic boat house and disused brick works have been identified as potentially contaminated.
- Receptors – This unit is a SAC, SPA, SSSI, NNR and Ramsar.
- Pathway – The disused brick works is within the flood and erosion zones. The other sites are only within the flood zone. The adopted SMP2 policy in this unit is 'No Active Intervention'.
- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are formal defences in places, but most sites are undefended. Implementing the adopted SMP2 policy will result in these sites eroding and sea level rise could lead to an increased frequency of tidal flooding of these sites. Therefore, before these sites do erode further investigation of what contamination is present should take place to assess the consequences.

7.2.20 Thorness Bay and southern Gurnard Bay (W20)

- Source – Ponds, two disused gravel pits, two sewage works and disused gun emplacements have been identified as potentially contaminated.
- Receptors – This unit is a SAC and the majority of it is also a SPA, SSSI and Ramsar.
- Pathway – There are multiple ponds with some just in the flood zone, some just in the erosion zone and some in both. One of the disused gravel pits is within the flood and erosion zones, the other is only within the erosion zone. One of the sewage works is within the flood and erosion zones, the other is only within the erosion zone. The gun emplacement is only within the erosion zone. The adopted SMP2 policy in this unit is 'No Active Intervention'.
- Assessment: Low risk. No previous site specific investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are formal defences in places, but most sites are undefended. Implementing the adopted SMP2 policy will result in these sites eroding and sea level rise could lead to an increased frequency of tidal flooding of these sites. Therefore, before these sites do erode further investigation of what contamination is present should take place to assess the consequences.

7.2.21 Gurnard Luck (W21)

- Source – Disused rifle range, ponds and a historic landfill site have been identified as potentially contaminated.
- Receptors – This unit is a SAC.
- Pathway – The rifle range is within both the flood and erosion zones. The other sites are only within the flood zone. The adopted SMP2 policy in this unit is 'Hold the Line' to 2025; beyond that it changes to 'No Active Intervention'.
- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. Sea level rise could lead to an increased frequency of tidal flooding of these sites. Any proposals to introduce new flood defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contamination risk should be undertaken. If it is implemented the assessment should take place before changing to 'No Active Intervention'.

7.2.22 Gurnard Cliff (W22)

- Source – No potentially contaminated sites are reported to exist within this unit.

- Assessment: Negligible risk.

7.2.23 Gurnard to Cowes Parade (W23)

- Source – Sailing club, historic brick field (including kiln), pits, historic ponds, boat house and grave yard have been identified as potentially contaminated.
- Receptors – This unit is a SAC.
- Pathway – The sailing club and historic brick field are within the flood and erosion zones. The other sites are only within the erosion zones. The adopted SMP2 policy in this unit is 'Hold the Line'.
- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites (mainly via overtopping of defences). Any proposals to introduce new defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.24 Cowes Town Centre to Fountain Yard (W24)

- Source – A sailing club has been identified as potentially contaminated.
- Receptors – This unit is a SAC; other receptors would be humans using the River Medina.
- Pathway – The site is within the flood and erosion zones. The adopted SMP2 policy in this unit is 'Hold the Line'.
- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. It is predicted that release of any contaminants present should only occur if hard (concrete) capping is damaged or removed. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken. Any future proposals to introduce new structures, replace or remove structures should undertake a more detailed assessment of the contamination risk, supported by ground investigations, as necessary.

7.2.25 Cowes: Fountain Yard to Medina Wharf (W25)

- Source – Multiple quays, slipways, jetties and wharfs, multiple industrial buildings (mostly boat building yards/engineering works/warehouses), fire engine station, yacht club, sailing centre, disused kiln, disused gravel pit and historic landfill site have been identified as potentially contaminated.

- Receptors – This unit is a SAC; other receptors would be humans using the River Medina.

- Pathway – Some of the quays, slipways, jetties, wharfs, industrial buildings and the yacht club are within the flood and erosion zones. The remaining sites are only within the flood zone. The adopted SMP2 policy in this unit is 'Hold the Line'.

- Assessment: High risk. These sites are potentially contaminated (most notably the historic landfill site in this unit), no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. It is predicted that release of any contaminants present should only occur if hard (concrete) capping is damaged or removed. The historic landfill site is currently undefended and listed as inert, although it is not within the erosion zone. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken. Any future proposals to introduce new structures, replace or remove structures on the frontline or setback should undertake a more detailed assessment of the contamination risk, supported by ground investigations, as necessary.

7.2.26 Central Medina – NW (W26)

- Source – Ponds, historic brick works and kiln, disused pit have been identified as potentially contaminated.

- Receptors – This unit is a SAC, SPA, SSSI and Ramsar; other receptors would be humans using the River Medina.

- Pathway – The sites are only within the flood zone. The adopted SMP2 policy in this unit is 'No Active Intervention'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk, however the adopted SMP2 policy is 'No Active Intervention'. If the adopted SMP2 policy is implemented the sources will continue to be linked to the receptors.

7.2.27 West Medina Mills (W27)

- Source – Works (previously used as cement works), depot and wharf have been identified as potentially contaminated.

- Receptors – This unit is a SAC, SPA, SSSI, Ramsar and adjacent to the south of the works is a LNR; other receptors would be humans using the River Medina.

- Pathway – The sites are only within the flood zone. The adopted SMP2 policy in this unit is 'Hold the Line'

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The facilities have hard walls and floors, which should be sufficient to remove the pathway. This is a recent development and a Flood Risk Assessment had to be produced to support the Outline Planning Application, suggesting the defences should be adequate. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. Any proposals to introduce new flood defences in the locations of these sites should include more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

7.2.28 Central Medina – SW (W28)

- Source – Disused clay pits, historic hydraulic pump, sailing centre, pond, landing stage and boathouse have been identified as potentially contaminated.

- Receptors – This unit is a SAC, SPA, SSSI and Ramsar; other receptors would be humans using the River Medina.

- Pathway – The sites are only within the flood zone. The adopted SMP2 policy in this unit is 'No Active Intervention'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk, however the adopted SMP2 policy is 'No Active Intervention'. If the adopted SMP2 policy is implemented the sources will continue to be linked to the receptors.

7.2.29 Newport Harbour (W29)

- Source – Multiple industrial units and warehouses, historic brick works, historic coal yards, quays and slipways, depots, historic gas works, historic industrial buildings have been identified as potentially contaminated.

- Receptors – This unit is a SAC, SPA, SSSI and Ramsar; other receptors would be humans using the River Medina.

- Pathway – The sites are only within the flood zone. There is not erosion risk this far inside the estuary, although the buildings immediately on the waterfront could collapse if their harbourside walls are not maintained. The adopted SMP2 policy in this unit is 'Hold the Line'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. It is predicted that release of any contaminants present should only occur if hard (concrete) capping is damaged or removed. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken. Any future proposals to introduce new structures, replace or remove structures should undertake a more detailed assessment of the contamination risk, supported by ground investigations, as necessary.

7.2.30 Central Medina – East (W30)

- Source – Waste water pumping station, ponds, disused corn mill and mill pond, filling station, historic landfill site and works have been identified as potentially contaminated.

- Receptors – This unit is a SAC, SPA, SSSI and Ramsar; other receptors would be humans using the River Medina.

- Pathway – The sites are only within the flood zone. It is unclear up to what elevation the pumping station is 'sealed'. The adopted SMP2 policy in this unit is 'No Active Intervention'.

- Assessment: High risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The waste water pumping station was previously used as a waste water treatment works. The probability of this site flooding is very low. There is also a works that has previously had waste issues identified such as contaminated water from old diesel/petrol tanks. Only a small proportion of this site is predicted to flood. The former landfill site is small and contains inert household and industrial waste such as soil and rubble so is not seen as a significant contamination risk. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing isolated defences would reduce this risk, however the adopted SMP2 policy is 'No Active Intervention' along the whole frontage (although privately funded maintenance may continue subject to the necessary consents). Any future proposals to introduce new structures, replace or remove structures should undertake a more detailed assessment of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is followed the sources will continue to be linked to the receptors. At this time there is nothing that suggests contamination risks are large enough to require remediation or new flood defences.

7.2.31 East Cowes: Kingston Road Power Station to Shrape Breakwater (W31)

- Source – Multiple industrial buildings (engineering works/shipbuilding yards) and warehouses, multiple quays, wharfs and slipways, gas works, historic brick works and quay, grave yard, disused rifle range, historic industrial buildings have been identified as potentially contaminated.

- Receptors – This unit is a SAC; other receptors would be humans using the River Medina.

- Pathway – Some of the quays, slipways, jetties, wharfs and industrial buildings within the flood and erosion zones. The remaining sites are only within the flood zone. The adopted SMP2 policy in this unit is 'Hold the Line'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. It is predicted that release of any contaminants present should only occur if hard (concrete) capping is damaged or removed. There are currently defences that should remove the potential erosion pathway if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken. Any future proposals to introduce new structures, replace or remove structures should undertake a more detailed assessment of the contamination risk, supported by ground investigations, as necessary.

7.2.32 Shrape Breakwater to Old Castle Point (W32)

- Source – Historic pond and paddling pool have been identified as potentially contaminated.

- Receptors – This unit is a SAC.

- Pathway – The sites are within the flood and erosion zones. The adopted SMP2 policy in this unit is 'Hold the Line' to 2025; beyond this it changes to 'No Active Intervention'.

- Assessment: Low risk. These sites are potentially contaminated, no previous site investigations have been made available and therefore until further evidence is acquired, it is assumed that any contaminants which were on site are still present. The sites are thought unlikely to contain significant sources of contamination. There are currently defences that should remove the potential erosion pathway until 2025 if the adopted SMP2 policy is implemented. Sea level rise could lead to an increased frequency of tidal flooding of these sites; sustaining or improving the standard of protection of the existing defences would reduce this risk. Proposals to transfer to 'No Active Intervention' in the long term should include more detailed assessments of the contamination risk, supported by ground investigations, as necessary. If the adopted SMP2 policy is not implemented more detailed assessment of the contaminated risk should be undertaken.

8. Conclusions

8.1 Summary

The purpose of this study has been to review the key potential contamination constraints in relation to the development and implementation of the Strategy. The identification of potential contamination sites that are within the flood and erosion zones of policy units has informed option development of the West Wight Strategy frontage. With limited information available on the nature of contamination at each site, the review has not attempted to undertake a detailed assessment of the physical and chemical characteristics of contamination and the mechanism of contamination reaching receptors; this is beyond the scope of this review.

Sites with potentially significant contamination sources have been risk assessed from an inspection of former land use data. Using the latest erosion and tidal flooding data available, combined with the IWC's contamination data has allowed relevant sites to be identified. The environmentally designated areas along the Strategy frontage that are potentially vulnerable to pollution have also been identified. A source-pathway-receptor model has been used to steer the risk assessment of the frontage into categories of High or Low risk. This has considered the presence of potentially contaminated material, existing and future flood and erosion behaviour, the likely level of works activity as a consequence of implementing the Strategy, and the receptors present.

8.2 Recommendations for Strategy Development and Implementation

During the option development process, the sites identified as high risk in this review have been considered in the appraisal of option; however it is noted that due to either an inert status or lack of identified pathways these high risk sites have not significantly influenced strategy option choices.

It should be noted that any future coastal defence works near or in potentially contaminated sites should include a more detailed assessment of the contamination risk as part of the Project Appraisal process.

Recommendations should be made in the detailed assessments on the scope of Ground Investigations to support or implement proposals for development of specific schemes. The need for Ground Investigations should be included as part of the Environment Agency's Project Appraisal Report process.

9. References

CIRIA C718 - Royal Haskoning DHV (2013) *Guidance on the management of landfill sites and land contamination on eroding or low-lying coastlines*. London: CIRIA.

Isle of Wight Council, Environment Agency and Royal Haskoning (2010) *Shoreline Management Plan 2*.

Isle of Wight Council (2014) *West Wight Strategy Study 2014 – Defence Appraisal*.

JBA Consulting (2015). *Isle of Wight Coastal Remedial Works*. Draft Report, May 2015. For Environment Agency – South East Region.

10. Addendum 1: Additional Assessment

At the time of undertaking the contaminated land assessment the Strategy was in the early phases of development and it was therefore assumed that the SMP2 policies would be adopted as the management approach across the frontage. However, since undertaking the assessment, the preferred options for the Strategy have been identified and in some instances, these differ in approach to the SMP2 policy. This has the potential to alter the outcome of the contamination assessment (i.e. the Strategy may suggest a Do Nothing approach in some areas instead of Hold the Line) and therefore an additional assessment has been undertaken in the areas where the preferred strategic option differs to the SMP2 policy. The units considered in this additional assessment are W2, W3, W4 and W6. A summary table of the findings from the assessment is shown below.

Unit	SMP2 Policy	Initial Contamination assessment	Preferred Strategic Option	Revised Contamination assessment following identification of preferred option
W2	Hold the Line	Low risk: Some potentially contaminated sites (historic lifeboat houses and electricity substations, coastguard station) exist in this unit but following the Hold the Line approach should ensure that the erosion pathway to the sites is removed. Flood risk to the sites would remain but could be mitigated by improvements to the existing defences to sustain / increase the standard of flood protection	Do Minimum (maintain H&S and access requirements) and Adaptation in the long term (through the development of a Coastal Change Management Area Plan (CCMAP))	Low risk: The preferred strategic approach is not committed to maintaining the structural integrity of existing defences or providing SoP upgrades. Therefore a flood and erosion pathway to the potentially contaminated sites has the potential to develop under this approach. However, whilst this is the case, at this stage the sites are not thought to contain significant sources of contamination and therefore the contamination risk is still considered to be low. Further studies are required to determine the presence of contaminated materials in the sites.
W3	Hold the Line	Low risk: A potentially contaminated site (disused battery) exists in this unit but following the Hold the Line approach should ensure that the erosion pathway to the sites is removed.	Do Minimum (maintain H&S and access requirements) and Adaptation in the long term (through the development of a Coastal Change Management Area Plan	Low risk: The preferred strategic approach is not committed to maintaining the structural integrity of existing defences. Therefore an erosion pathway to the potentially contaminated site has the potential to develop under this approach. However, whilst this is the case, at this stage the site is not thought to contain significant sources of contamination and therefore

			(CCMAP))	the contamination risk is still considered to be low. Further studies are required to determine the presence of contaminated materials in the site.
W4	Hold the Line	Low risk: A potentially contaminated site (disused gravel pit) exists in this unit but following the Hold the Line approach should ensure that the erosion pathway to the sites is removed.	Do Minimum (maintain H&S and access requirements) and Adaptation in the long term (through the development of a Coastal Change Management Area Plan (CCMAP))	Low risk: The preferred strategic approach is not committed to maintaining the structural integrity of existing defences. Therefore an erosion pathway to the potentially contaminated site has the potential to develop under this approach. However, whilst this is the case, at this stage the site is not thought to contain significant sources of contamination and therefore the contamination risk is still considered to be low. Further studies are required to determine the presence of contaminated materials in the site.
W6	Hold the Line then No Active Intervention from 2055	Low risk: Some potentially contaminated sites (historic battery and rifle range and fort) exist in this unit but following the Hold the Line approach should ensure that the erosion pathway to the sites is removed. Flood risk to the fort and rifle range sites would remain but could be mitigated by improvements to the existing defences to sustain / increase the standard of flood protection	Do Minimum (maintain H&S and access requirements) and Adaptation in the long term (through the development of a Coastal Change Management Area Plan (CCMAP))	Low risk: The preferred strategic approach is not committed to maintaining the structural integrity of existing defences or providing SoP upgrades. Therefore a flood and erosion pathway to the potentially contaminated sites has the potential to develop under this approach. However, whilst this is the case, at this stage the sites are not thought to contain significant sources of contamination and therefore the contamination risk is still considered to be low. Further studies are required to determine the presence of contaminated materials in the sites.