



Marine Management Organisation Marine Licence

1 Introduction

This is a licence granted by the Marine Management Organisation on behalf of the Secretary of State to authorise the licence holder to carry on activities for which a licence is required under Part 4 of the Marine and Coastal Access Act 2009.

1.1 Licence number

The licence number for this licence is L/2017/00482/2

1.2 Licence holder

The licence holder is the person or organisation set out below:

Name / company name	K3 CHP LTD
Company registration number (if applicable)	9240062
Address	Wheelabrator Technologies, Portland House, London, SW1E 5BH
Contact within company	Chris Ratcliffe
Position within company (if applicable). State if company officer or director	Head of Modelling and Planning

1.3 Licence date

Version	2
Licence start date	21 December 2017
Licence end date	31 December 2060
Date of original issue	21 December 2017
Date of variation issue	10 May 2019

1.4 Licence validity

This version of this licence is valid from the licence start date to the licence end date.

This version of this licence supersedes any earlier version of this licence. Any activity commenced under a previous version of this licence and which is also a licensed activity authorised by section 4 of this version of this licence may continue in accordance with the licence conditions in section 5 of this version of this licence.

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2 General

2.1 Interpretation

In this licence, terms are as defined in section 115 of the Marine and Coastal Access Act and the Interpretation Act 1978 unless otherwise stated.

- "licensed activity" means any activity set out in section 4 of this licence.
- "licence holder" means the person(s) or organisation(s) named in section 1 above to whom this licence is granted.
- "MMO" means the Marine Management Organisation.
- "mean high water springs" means the average of high water heights occurring at the time of spring tides.
- "sea bed" or "seabed" means the ground under the sea.
- "the 2009 Act" means the Marine and Coastal Access Act 2009.
- All times shall be taken to be the time on any given day.
- All geographical co-ordinates contained within this licence are in WGS84 format (latitude and longitude degrees and minutes to three decimal places) unless stated otherwise.

2.2 Contacts

Except where otherwise indicated, the main point of contact with the MMO and the address for email and postal returns and correspondence shall be:

Marine Management Organisation

Lancaster House

Hampshire Court

Newcastle upon Tyne

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Tel:0300 123 1032

Fax:0191 376 2681

Email:marine.consent@marinemangement.org.uk

Any references to any local MMO officer shall be the relevant officer in the area(s) located at:

Marine Management Organisation

Fish Market

Rock-A-Nore Road

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3 Project overview

3.1 Project title

Kemsley Generating Station Outfall

3.2 Project description

The Wheelabrator Kemsley Generating Station is a consented Energy from Waste (EfW) and Combined Heat and Power (CHP) facility which is currently under construction.

Planning permission for that development, including a surface water outfall to the Swale Estuary, was granted on the 06 March 2012 under the Town and Country Planning Act 1990 by Kent County Council (KCC) and was accompanied by an Environmental Statement. The reference for this is PAG/MC/SW/10/444 and the full suite of documents supporting the planning application can be found on the KCC planning portal.

The Generating Station will provide low pressure steam to the existing Kemsley Paper Mill adjacent to the site and low carbon electricity to the grid. A Development Consent Order (DCO) application will be submitted for the construction of a new EFW facility known as Wheelabrator Kemsley North (WKN) on the area of land to the north of the generating station.

This project was originally for the construction and operation of an outfall to serve the Generating Station and/or an Incinerator Bottom Ash Recycling Facility. That outfall was constructed. This was then updated in April 2019 (Variation 01) in order to licence the construction of a 2nd outfall. This infrastructure that will discharge clean surface water, via an attenuation pond, from the Generating Station and the proposed Wheelabrator Kemsley North (WKN) facility into the intertidal area of the Swale Estuary.

4 Licensed activities

This section sets out the licensed activities. The licensed activities are authorised to be carried on only in accordance with the activity details below and with the licence conditions as set out in section 5 of this licence.

Please note that where licensed quantities are displayed with reference to their constituent materials, the relative quantities given for the constituent materials are indicative only.

Site 1 - Surface Water Outfall Construction & Operation	
Site location	The Kemsley Generating Station Outfall is located east of the Kemsley Paper Mill complex at Kemsley, Sittingbourne, Kent.
Activity 1.1 - Construction of new outfall	
Activity type	Construction of new works
Activity location	See Coordinate Schedule for activity location.
Description	<p>There are two options for the construction of the outfall(s). Option A would be to provide an outfall to the Generating Station and would comprise:</p> <p>a) one 600mm diameter pipe set within a concrete head wall (approx. 3m in width and 4m in depth) within a excavated area enclosed by a temporary bund measuring approximately 17m in width, 13m in length and 1.9m deep, and reinforced by driven sheet metal piling; and</p> <p>b) a 3m wide by 5m long (and 0.5m deep) reno mattress situated on the seaward side of the outfall at the existing ground level.</p> <p>Option B would incorporate two drainage pipes, one to serve the Generating Station and another to serve the proposed Wheelabrator Kemsley North (WKN) facility, and would comprise:</p> <p>a) two 600mm diameter pipes set within a concrete head wall (approx. 6m in width and 4m in depth) within a excavated area enclosed by a temporary bund measuring approximately 20m in width, 13m in length and 1.9m deep, and reinforced by driven sheet metal piling; and</p> <p>b) a 5m wide by 6m long (and 0.5m deep) reno mattress situated on the seaward side of the outfall at the existing ground level.</p> <p>The outfall(s) would be located within the existing seawall as shown on the plan and sections of Figures 2a</p>

	<p>(Option A) and 2b (Option B) of Schedule document 'MLA_2017_00316-ES Addendum-3'.</p> <p>Please see Schedule document 'MLA_2017_00316-ES Addendum-3' for a detailed description of the works.</p>
Methodology	<p>The proposed construction sequence is as follows:</p> <ol style="list-style-type: none"> 1. Establish working area within the site boundary; 2. Remove boundary fence and extend to edge of sea defence; 3. Install earth bund to estuary to form working platform; 4. Install sheet piling; 5. Excavate within the earth bund; 6. Cut down sheet piles to profile; 7. Install reno matting; 8. Install 600mm diameter pipe from head wall to attenuation pond; 9. Remove remaining berm and reinstate area; 10. Close boundary fence and reopen footpath. <p>Please refer to Schedule document 'MLA_2017_00316-ES Appendix 3.1 Outfall Construction Method Statement-5' for a detailed methodology.</p>
Programme of works	<p>Works may only take place between 1 April and 31 September in any given year.</p> <p>The overall duration of works is estimated to take approximately 10 weeks.</p> <p>The following timings are indicative and will depend on site conditions and progress of the construction works:</p> <ol style="list-style-type: none"> 1. Establish working area within the site boundary - 2 days; 2. Remove boundary fence and extend to edge of sea defence - 2 days; 3. Install earth bund to estuary to form working platform - 1 week; 4. Install sheet piling - 1 week; 5. Excavate within the earth bund - 1 week; 6. Cut down sheet piles to profile - 1 week; 7. Install reno matting - 2 weeks; 8. Install 600mm diameter pipe from head wall to attenuation pond - 2 weeks;

9. Remove remaining berm and reinstate area - 1 week;

10. Close boundary fence and reopen footpath - 1 week.

Please refer to Schedule document 'MLA_2017_00316-ES Appendix 3.1 Outfall Construction Method Statement-5' a detailed programme of works

5 Licence conditions

5.1 General conditions

5.1.1 Notification of commencement

The licence holder must notify the MMO prior to the commencement of the first instance of any licensed activity. This notice must be received by the MMO no less than five working days before the commencement of that licensed activity.

5.1.2 Licence conditions binding other parties

Where provisions under section 71(5) of the 2009 Act apply, all conditions attached to this licence apply to any person who for the time being owns, occupies or enjoys any use of the licensed activities for which this licence has been granted.

5.1.3 Agents / contractors / sub-contractors

The licence holder must notify the MMO in writing of any agents, contractors or sub-contractors that will carry on any licensed activity listed in section 4 of this licence on behalf of the licence holder. Such notification must be received by the MMO no less than 24 hours before the commencement of the licensed activity.

The licence holder must ensure that a copy of this licence and any subsequent revisions or amendments has been provided to, read and understood by any agents, contractors or sub-contractors that will carry on any licensed activity listed in section 4 of this licence on behalf of the licence holder.

5.1.4 Vessels

The licence holder must notify the MMO in writing of any vessel being used to carry on any licensed activity listed in section 4 of this licence on behalf of the licence holder. Such notification must be received by the MMO no less than 24 hours before the commencement of the licensed activity. Notification must include the master's name, vessel type, vessel IMO number and vessel owner or operating company.

The licence holder must ensure that a copy of this licence and any subsequent revisions or amendments has been read and understood by the masters of any vessel being used to carry on any licensed activity listed in section 4 of this licence, and that a copy of this licence is held on board any such vessel.

5.1.5 Changes to this licence

Should the licence holder become aware that any of the information on which the granting of this licence was based has changed or is likely to change, they must notify the MMO at the earliest opportunity. Failure to do so may render this licence invalid and may lead to enforcement action.

5.2 Project specific conditions

This section sets out project specific conditions relating to the licensed activities as set out in section 4 of this licence.

Prior to commencement of licensed activities	
5.2.1	<p>The licence holder must notify the UK Hydrographic Office a minimum of 5 working days in advance of commencement as part of this licence to permit the promulgation of maritime safety information and updating of nautical charts and publications. A copy of the notification to be sent to the MMO within 5 days of issue.</p> <p>Reason: <i>To ensure other vessels in the vicinity can safely plan and conduct their passage.</i></p>
5.2.2	<p>The undertaker must ensure that a notice to mariners is issued at least 5 working days prior to the commencement of the licensed activities and a copy sent to the MMO within 5 working days of issue.</p> <p>Reason: <i>To ensure other vessels in the vicinity can plan and safely conduct their passage.</i></p>
5.2.3	<p>Post-construction monitoring of saltmarsh recovery must be undertaken.</p> <p>A monitoring specification must be submitted to and approved in writing by the MMO a minimum of 6 weeks prior to commencement of activities.</p> <p>Reason: <i>In order to verify predictions of saltmarsh recovery.</i></p>
5.2.4	<p>An updated monitoring specification must be submitted to and approved in writing by the MMO a minimum of 4 weeks prior to the commencement of 2nd outfall activities.</p> <p>Reason: <i>In order to verify predictions of saltmarsh recovery.</i></p>

During licensed activities	
5.2.5	<p>Bunding and/or storage facilities must be installed to contain and prevent the release of fuel, oils, and chemicals associated with plant, refuelling and construction equipment, into the marine environment. Secondary containment must be used with a capacity of no less than 110% of the container's storage capacity.</p> <p>Reason: <i>To minimise the risk of marine pollution incidents.</i></p>
5.2.6	<p>The licence holder must employ the use of brush barriers on either side of the outfall structure.</p> <p>Reason: <i>In order to help retain sediment and encourage saltmarsh to redevelop around the outfall structure.</i></p>
5.2.7	<p>Continuous Flight Auger piling must be used where possible, as outlined in the Habitats Regulations Assessment Report.</p> <p>If impact piling is required during construction of the earth berm/coffer dam the licence holder must ensure a gradual ramping up or slow start of piling.</p> <p>The soft-start duration must be a period of not less than 20 minutes. Should piling cease for a period greater than 10 minutes, then the soft start procedure must be repeated.</p> <p>Reason: <i>To avoid noise and vibration disturbance to waterbirds using the intertidal area, and to allow mobile sensitive receptors to move away from the source of acoustic disturbance in order to reduce the risk of injury.</i></p>
5.2.8	<p>Only coatings and treatments can be used that are suitable for use in the marine environment.</p> <p>Reason: <i>To ensure hazardous chemicals that may be toxic, persistent or bioaccumulative are not released into the marine environment.</i></p>

5.2.9	<p>During licensed activities all wastes must be stored in designated areas that are isolated from surface water drains, open water and bunded to contain any spillage.</p> <p>Reason: <i>To minimise the risk of waste entering the marine environment.</i></p>
5.2.10	<p>If concrete is to be sprayed suitable protective sheeting must be provided to prevent rebounded or windblown concrete from entering the water environment. Rebounded material must be cleared away before the sheeting is removed.</p> <p>Reason: <i>To minimise risk of damage to the marine environment by wet concrete contamination which is highly alkaline and contains high levels of suspended sediment.</i></p>
5.2.11	<p>Waste concrete, slurry or wash water from concrete or cement activities must not be discharged, intentionally or unintentionally, into the marine environment. Concrete and cement mixing and washing areas must be contained and sited at least 10 metres from any watercourse or surface water drain.</p> <p>Reason: <i>To avoid damage to the marine environment by concrete wash water contamination which is highly alkaline and contains high levels of suspended sediment.</i></p>

Upon completion of licensed activities

5.2.12	<p>Post-construction monitoring of saltmarsh recovery must be undertaken in-line with the specification required under licence condition 5.2.3 and 5.2.4.</p> <p>Reason: <i>In order to verify predictions of saltmarsh recovery.</i></p>
5.2.13	<p>The outfall structure must not exceed a maximum of 5% reduction in surrounding depth referenced to Chart Datum.</p> <p>Reason:</p>

	<i>To ensure existing and future safe navigation is not compromised.</i>
5.2.14	<p>The licence holder must notify the local MMO office as detailed in section 2.2 of the completion of the licensed activities, no later than 10 working days after their completion.</p> <p>Reason: <i>To ensure the local MMO officer is aware of the licensed activities at sea occurring within its jurisdiction in order to notify other sea users and to arrange any enforcement visits where appropriate.</i></p>
5.2.15	<p>All equipment, temporary structures, waste and/or debris associated with the licensed activities must be removed upon completion of the licensed construction activities.</p> <p>Reason: <i>To minimise impacts to the marine environment and other users of the sea/seabed.</i></p>
5.2.16	<p>The licence holder must notify The Source Data Receipt team, UK Hydrographic Office, Taunton, Somerset, TA1 2DN (Email:sdr@ukho.gov.uk; Tel: 01823 337900) of completion of the licensed activities, no later than 5 working days after their completion.</p> <p>A copy of the notification must be sent to the MMO within one week of the notification being sent.</p> <p>Reason: <i>To ensure necessary amendments to charts can be made.</i></p>

6 Compliance and enforcement

This licence and its terms and conditions are issued under the Marine and Coastal Access Act 2009.

Any breach of the licence terms and conditions may lead to enforcement action being taken. This can include variation, revocation or suspension of the licence, the issuing of an enforcement notice, or criminal proceedings, which may carry a maximum penalty of an unlimited fine and / or a term of imprisonment of up to two years.

Your attention is drawn to Part 4 of the Marine and Coastal Access Act 2009, in particular sections 65, 85 and 89 which set out offences, and also to sections 86, 87 and 109 which concern defences. The MMO's Compliance and Enforcement Strategy can be found on our website (<https://www.gov.uk/government/publications/compliance-and-enforcement-strategy>).

Date: 25 January 2019

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Dear Sir / Madam,

APPLICATION FOR THE VARIATION OF MARINE LICENSE (Ref. No. L/2017/00482/1) AT KEMSLEY GENERATING STATION, SITTINGBOURNE, KENT.

We write on behalf of our client, Wheelabrator Technologies, to submit this application for a variation of the above marine license.

The application has been submitted via the Marine Management Organisation's website and we are currently awaiting confirmation of the application fee. Along with this covering letter the application comprises of the following documentation:

- Marine Licence Application Form;
- Kemsley Power Station 2nd Outfall – Environmental Appraisal (Rev 01);
- Construction Method Statement;
- Location Plan (ref: 9812-0042-0004);
- Proposed Plans and Section Option B (Fig 2b); and
- Swale Outfall Construction Plan (AAK-04-20 02 00 22_CCG9 C01 Rev A)

The Proposal

The site currently benefits from a marine licence for the construction and operation of an outfall to discharge surface water via attenuation into the intertidal area of the Swale Estuary. The licence was granted on the 21st December 2017 (licence no: L/2017/00482/1).

The licenced activities outlined within the notice permitted two options for the construction of the outfall which are quoted below:

“Option A would be to provide an outfall to the Generating Station and would comprise:

a) one 600mm diameter pipe set within a concrete head wall (approx. 3m in width and 4m in depth) within an excavated area enclosed by a temporary bund measuring approximately 17m in width, 13m in length and 1.9m deep, and reinforced by driven sheet metal piling; and

b) a 3m wide by 5m long (and 0.5m deep) reno mattress situated on the seaward side of the outfall at the existing ground level.

Option B would incorporate two drainage pipes, one to serve the Generating Station and another to serve the consented Incinerator Bottom Ash (IBA) facility, and would comprise:

a) two 600mm diameter pipes set within a concrete head wall (approx. 6m in width and 4m in depth) within an excavated area enclosed by a temporary bund measuring approximately 20m in width, 13m in length and 1.9m deep, and reinforced by driven sheet metal piling; and

b) a 5m wide by 6m long (and 0.5m deep) reno mattress situated on the seaward side of the outfall at the existing ground level”

Since the licence was consented Wheelabrator Technologies are now preparing an application for the construction of a new EFW facility on the site in place of the consented IBA Facility. The new EFW facility will be known as Wheelabrator Kemsley North (WKN) and a Development Consent Order (DCO) will be submitted in April 2019. Prior to the DCO being submitted our client seeks to ensure that a licence is in place for an outfall serving the WKN (new energy from waste facility) operation.

Option A has now been constructed and is operational. However, our client now wishes to construct what would effectively be Option B albeit the second pipe would now serve the WKN operation rather than the IBA operation, as previously proposed. It is important to note that the IBA may have discharged polluted water to the Estuary via the outfall, whereas the WKN development being an EFW will always discharge clean surface water like the existing EFW operation served by Option A. This should therefore represent an improvement on the worse case position assessed and consented.

Pre-application discussions took place with Lisa Southwold and Kathleen Monghan at the MMO on 22nd October 2018. It was confirmed by the MMO that an application for a variation to the wording of the existing marine licence would be appropriate rather than a separate application for a standalone marine licence.

It was, therefore, agreed that as the licenced activities to which the extant marine licence relates make specific reference to the IBA within Option B), an application would be required to vary the wording of the marine licence to substitute references to the IBA and confirm that the discharge will come from the new EFW plant.

As such, the alternate wording proposed to the extant marine licence is shown below with the amended section underlined. Essentially, the proposed change in wording replaces reference to the IBA with WKN facility:

“Option A would be to provide an outfall to the Generating Station and would comprise:

a) one 600mm diameter pipe set within a concrete head wall (approx. 3m in width and 4m in depth) within an excavated area enclosed by a temporary bund measuring approximately 17m in width, 13m in length and 1.9m deep, and reinforced by driven sheet metal piling; and

b) a 3m wide by 5m long (and 0.5m deep) reno mattress situated on the seaward side of the outfall at the existing ground level.

*Option B would incorporate two drainage pipes, one to serve the Generating Station and another to serve the ~~consented Incinerator Bottom Ash (IBA)~~ **proposed WKN** facility, and would comprise:*

a) two 600mm diameter pipes set within a concrete head wall (approx. 6m in width and 4m in depth) within an excavated area enclosed by a temporary bund measuring approximately 20m in width, 13m in length and 1.9m deep, and reinforced by driven sheet metal piling; and

b) a 5m wide by 6m long (and 0.5m deep) reno mattress situated on the seaward side of the outfall at the existing ground level”

In addition, as the original outfall (i.e. Option A) has been completed and is operational, a second phase of construction would be required in order to construct the second outfall pipe. As this second phase of construction was not proposed or assessed in the previous application, the MMO confirmed that any impacts arising from the second phase of construction upon the salt marsh would need to be assessed and submitted as part of this application. As a consequence an Environmental Appraisal for the second outfall has been prepared and submitted to support the application which not only covers potential impact on the salt marsh but other environmental assets as well.

The Environmental Appraisal concludes that the proposal to construct a second outfall at this location will not have any significant impact on the intertidal saltmarsh. Nor would the proposal have any significant impact on the Swale Ramsar and SPA or the Milton Creek LWS both of which contain saltmarsh habitat. The Appraisal also found that the proposal would have no significant impact on the Swale Marine Conservation Zone; Elmley Island NNR, fish species or breeding birds outside of the SPA. As such the report demonstrates that there will be no detrimental environmental impact as a consequence of the second phase of construction at the outfall. Consequently, there are no environmental effects which would indicate that the variation of the marine licence cannot be granted.

The MMO also advised that no other supporting documentation for the application was required. We can, however, confirm that the second outfall will be constructed in the same manner as set out within the previously approved Construction Method Statement which has been re-submitted as part of this application.

Finally, the MMO also confirmed that the proposed development subject to this marine license variation is not EIA development, and as such, it was not necessary to submit an Environmental Statement. This is consistent with the Screening Opinion adopted by the MMO on 26 September 2017 in respect of the original marine license application.

Summary

This application seeks to amend an approved marine licence (ref: L/2017/00482/1) to allow it to serve the proposed WKN facility rather than the IBA facility which was originally proposed on that site. The variation is therefore simply a change to the wording on the licence with the reference to the IBA within the licence substituted with that of the proposed WKN (energy from waste) facility. This will result in cleaner water being discharged at all times rather than the potentially polluted water that the IBA would have discharged at times; and, therefore represents an improvement on the worse case position that was assessed and consented as part of the current licence in respect of the IBA facility.

The original marine licence application included an option to construct the two outfall pipes, and as such the proposal has already been found to be compliant with the relevant marine planning policy framework.

The supporting Environmental Appraisal demonstrates that the proposal would not have a detrimental impact on the salt marsh or any other environmental asset during the construction stage. Therefore, it has been demonstrated that the proposed development would not have adverse effects on the integrity of the conservation objectives of International and European nature conservation sites.

The proposal, is therefore, compliant with planning policy framework and there are no other relevant considerations which would indicate that the variation to the marine licence should not being granted in planning policy terms. Accordingly, in accordance with the provisions of the Marine and Coastal Access Act 2009 it is concluded that the proposed works are acceptable and the variation to the marine license should be granted.

We trust that the information submitted is satisfactory and sufficient to allow the wording on the existing marine licence to be amended.

Yours sincerely,
for RPS Consulting Services Limited



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Wheelabrator Technologies
Kemsley Power Station, Kent
2nd Outfall – Environmental Appraisal

Date: 19/12/2018

Revision: Rev01



Wheelabrator Technologies

Kemsley Power Station, Kent

2nd Outfall – Environmental Appraisal

DATE	VERSION	DESCRIPTION	PREPARED	CHECKED	APPROVED
11/12/18	Rev00	Draft for Internal Review	AC	NS	NS
19/12/18	Rev01	Draft for Client Review	AC		
File Reference: \\lon-wal-03\Projects_HSERM\RPS P&D\EOR0705 - Kemsley Power Station Marine Support\03_Deliverables\Outfall 2\Final					

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19/12/2018

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1 Introduction

1.1 Background

This Environmental Appraisal has been prepared in support of an Marine Licence (ML) variation application by Wheelabrator Technologies (hereafter referred to as “the Applicant”) for the installation of a 2nd outfall (“the Development”) to discharge surface water via an attenuation pond into the intertidal area of the Swale Estuary (Figure 1-1).

The site has previously been granted a ML (MLA/2017/00316) on the 21st December 2017; licensed activity outlined within the notice provided two options for the construction of the outfall. Option A to provide an outfall to serve the Kemsley K3 Combined Heat and Power station (here after referred to as the ‘Generating Station’) and option B to incorporate two outfalls to serve the Generating Station and the Incinerator Bottom Ash (IBA) facility. Since that time the Applicant has decided to erect option A. The purpose of the outfall pipe is to discharge surface water from the facilities via an attenuation pond into the Swale Estuary.

Further to the consented development, the Applicant is now intending to erect a new Energy-From-Waste (EFW) plant on the site in place of the IBA facility known as Wheelabrator Kemsley North (WKN) facility. This Development will require the installation of a second drainage water outfall in the sea wall in the north east of the application area, 4.63 m from the original consented outfall (here after known as the ‘existing outfall’). The proposed outfall will discharge clean drainage water from the WKN site onto the intertidal sediments of the Swale (including The Swale Marine Conservation Zone (MCZ)).

The previous ML consented for the release of discharge polluted water from the IBA facility; the WKN facility being an EFW plant will now discharge clean water representing a marked improvement on the worst-case scenario assessed and consented in the current ML. However, construction will be required to install the second outfall pipe for the WKN facility which was not proposed, assessed or consented for in the previous application. Therefore, the intention of this Environmental Appraisal is to support a ML variation application to the existing MLA/2017/00316 application and will assess any environmental impacts that may arise during the construction of this second outfall.

Under the Marine and Coastal Access Act 2009, a ML is required for activities that involve the deposit or removal of a substance or object and the construction, alteration or improvement of works within the UK marine licensing area. The Applicant considers that an Environmental Impact Assessment (EIA) under The Marine Works (Environmental Impact Assessment) Regulations 2007 as amended by the Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2011 is not required to support the ML application, as a previous EIA was submitted alongside the original MLA/2017/00316 application and the proposed works are not Annex 1 or Annex 2 development under the European Commission (EC) Directive 85/337/EEC (as amended).

1.2 Consultation

Discussions with the Marine Management Organisation (MMO) held on the 22nd October confirmed that an application for a variation to the existing ML would be appropriate rather than a separate application for a standalone ML. It was also agreed that the variation application could be dealt with via a covering letter and completing the associated forms proposing an amended version of the ML and its wording. The covering letter will set out that the previous ML had been accepted, that it meets relevant policy requirements and no adverse impacts were found.

In addition, MMO confirmed that additional supporting information (an Environment Appraisal) would be required which would assess the potential impacts caused by a second period of construction on the saltmarsh. As this Development would lead to the construction of an outfall pipe at the location of the existing outfall and would lead to additional clean water being discharged, it was agreed to be highly unlikely that it will have any detrimental impact upon the saltmarsh. This Environmental Appraisal provides the assessment of potential impacts requested by the MMO. It is understood that from these discussions with the MMO that no other assessment or submission documentation is required, including Screening, Scoping or Assessment requirements under the Environmental Impact Assessment Regulations/Directive, Habitat Regulations/Directive, and/or Water Framework Directive (WFD).



Figure 1-1: Existing Outfall under MLA/2017/00316 and the proposed WKN Outfall.

2 Project Description

2.1 Background

The Development comprises of one 600 mm diameter pipe set within a concrete head wall (approximately 3 m in width and 4 m in depth) within an excavated area enclosed by a temporary bund measuring approximately 17 m in width, 13 m in length and 1.9 m deep, and reinforced by driven sheet metal piling. A 3 m wide by 5 m long (and 0.5 m deep) reno mattress situated on the seaward side of the outfall will be laid at the existing ground level.

2.2 Licensable Activities

The Applicant seeks consent for an outfall pipe into the Swale Estuary adjacent to service the WKN facility. The methodology for the construction of the outfall is outlined below. It is important to note that the licensable activities do not constitute a material change to the original consented ML.

2.3 Construction

Full details and programme of the proposed works are found in the Construction Method Statement (CMS) and the submitted plans and sections. It is proposed that the Development will be constructed in several stages and follow the same CMS submitted for the previous ML application.

To establish the working area, a heras panel fencing will be erected and extended out onto and over the existing footpath to prevent any unauthorised access. The footpath will be closed, upon agreement with the local council prior to the commencement of work.

Following this, the Development will require an approximately 13 m long by 17 m wide earth bund within the intertidal area of the Swale Estuary. A working platform will be created out of clay or similar approved material and a suitable capping layer will be installed on the working platform to allow the safe working of machinery. To strengthen the working platform and sea wall during the construction process and to assist with the construction of the outfall, 6 m sheet piles will be installed via vibro-hammer piling to act as reinforcement to the banking.

Upon installation of the sheet piling, the outfall area will be excavated using a 20t excavator and the sheet piling cut to the required profile. The working platform leaves a bund around the perimeter of the construction area which will protect it from water ingress and flooding.

A 600 mm diameter outfall pipe will then be laid by open cut technique from the attenuation pond on the landward side of the Development. Once this pipework and outfall have been completed and installed the earth bund will be removed, working from the back of the bund towards the land. The water will drain naturally from the outfall across the mudflats towards the river channel.

Upon completion of the construction works, the embankment and footpath will be reinstated, and the existing fence will be reinstalled along the site boundary. The Development will allow clean surface water to be discharged in a safe manner from the site into the river estuary.

3 Existing Environment

3.1 Overview

As detailed in Section 1.1, the Development is proposed to be constructed within the Swale Estuary, part of the Swale Estuary Marine Conservation Zone (MCZ). Publicly available information sources have been sought to inform the baseline characterisation for the purposes of this Environmental Appraisal. These include:

- Publicly available environmental datasets and information, e.g. EUNIS habitat data, reports by Cefas on fish spawning and nursery habitats and breeding birds;
- Information and reports for other infrastructure projects in the region (e.g. Kemsley K3 Combined Heat and Power Station Environmental Statement (ES) (RPS 2017d));
- Pre-construction saltmarsh survey undertaken by RPS in May 2018.

3.2 Designated Sites

There are eight internationally and five nationally designated areas that occur within the 10 km search area (Figure 3-1). Sites that are further than 2 km from the Development are highly unlikely to be affected by the outfall works and have therefore been screened out of this Environmental Appraisal. These sites have been greyed out below:

- Internationally designated site:
 - The Swale Special Protection Area (SPA) – 0.001 km east;
 - The Swale Ramsar – 0.001 km east;
 - Medway Estuary and Marshes SPA – 2.1 km north;
 - Medway Estuary and Marshes Ramsar – 2.1 km north;
 - Thames Estuary and Marshes SPA – 8.7 km north west;
 - Thames Estuary and Marshes Ramsar – 8.7 km north west;
 - Queensdown Warren SAC – 9.3 km south west; and
 - Outer Thames Estuary SPA – 8.0 km north.
- Nationally designated sites located within 2 km:
 - The Swale Marine Conservation Zone (MCZ) – in site;
 - The Swale Site of Special Scientific Interest (SSSI) – 0.001 km east;
 - Medway Estuary and Marshes SSSI - 2.1 km north;
 - Elmley National Nature Reserve (NNR) - 0.4 km east;

A summary of the internationally and nationally designated sites screened into this Environmental Appraisal as having the potential to interact with the outfall pipe, and their reasons for designation can be found within Table 3-1.

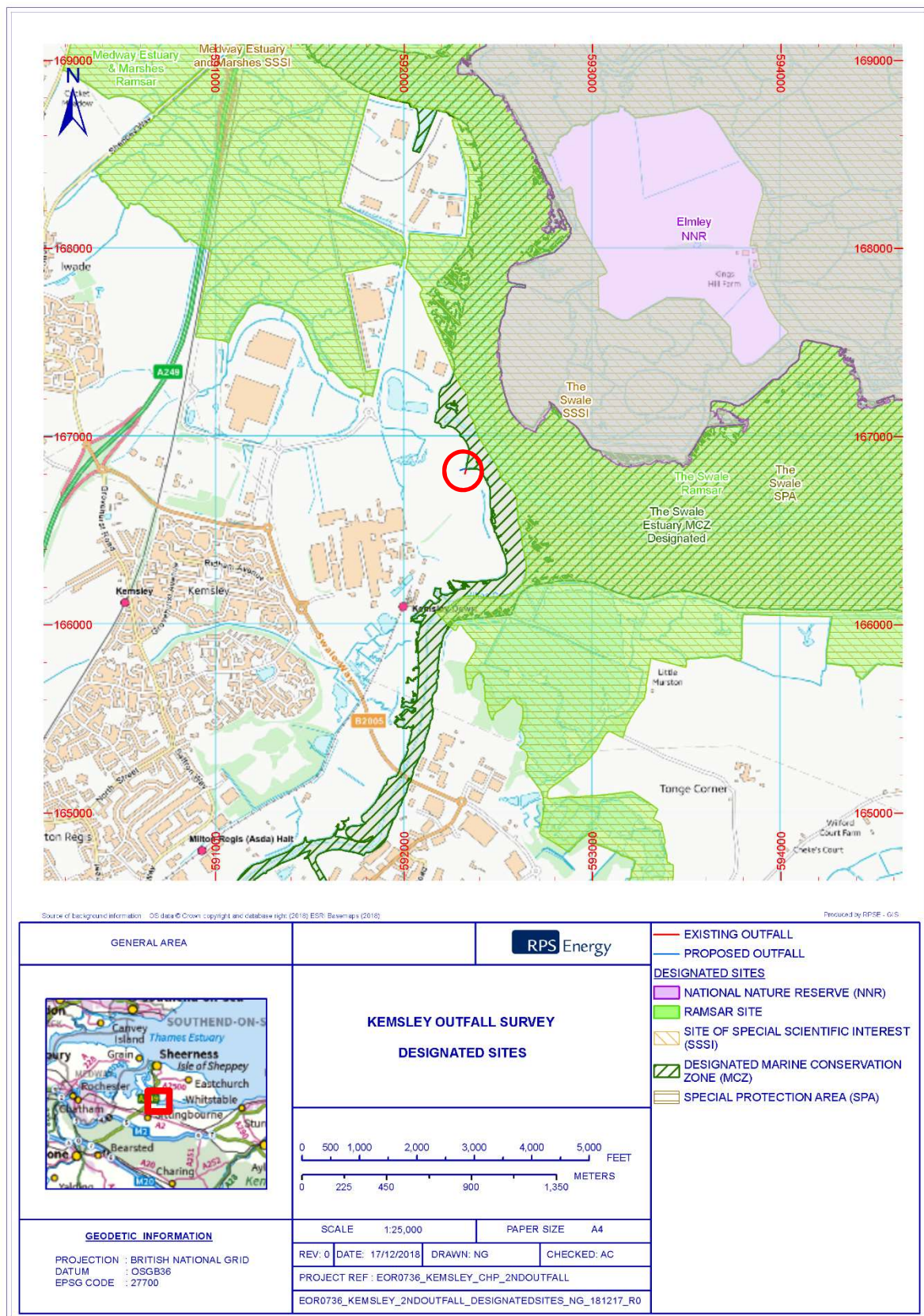


Figure 3-1: Designated sites in the vicinity of the Development (red circle indicates outfall locations).

Table 3-1: Summary of the designated features of each site.

Designated site	Distance from designated site	Reasons for Designations
The Swale SPA, Ramsar and SSSI	0.150 km west	The Swale SPA, Ramsar and SSSI are located on the south side of the outer part of the Thames Estuary in south-eastern England. The Swale is an estuarine area that separates the Isle of Sheppey from the Kent mainland. The site is a matrix of brackish and freshwater, floodplain grazing marsh with ditches, and intertidal saltmarshes and mudflats. The site has received designation for supporting populations of European important species, including breeding populations of avocet <i>Recurvirostra avosetta</i> , marsh harrier <i>Circus aeruginosus</i> and mediterranean gull <i>Larus melanocephalus</i> , and over-wintering populations of bar-tailed godwit <i>Limosa lapponica</i> , golden plover <i>Pluvialis apricaria</i> and hen harrier <i>Circus cyaneus</i> .
The Swale Estuary MCZ	0 km (within site)	The Swale Estuary MCZ was designated in January 2016 and covers an area of 51 km ² . The area designated is an inshore site and covers the Swale Estuary from the point at which it meets the Medway Estuary, south of the Isle of Sheppey, and extends towards the end of The Street at Whitstable. The site is highly diverse and an important spawning and nursing ground for various fish species. The main channel of the Swale Estuary contains several important seabed habitats, such as sand and sediments. The coarse sediment is home to fauna such as bristleworms (Polychaete), sand mason worms <i>Lanice conchilega</i> , small shrimp-like animals, burrowing anemones, and cockles. Broad scale habitat features of the Swale Estuary MCZ include intertidal habitats (i.e. estuarine rocky habitats, low energy intertidal rock, intertidal mixed sediment, intertidal coarse sediment and intertidal sand and muddy sand) and subtidal habitats (i.e. subtidal coarse, mixed, sand and muddy sediments).
Elmley NNR	0.377 km west	Elmley NNR is home to large numbers of wintering wildfowl and breeding waders. This wide expanse of grazing marsh, divided by ditches and frequent shallow surface flooding, is at or below sea level.
Milton Creek Local Wildlife Site (LNR) (non-statutory)	<2 km	<p>There is one non-statutory designated site within 2 km of the site boundary, Milton Creek Local Wildlife Site (LWS). This site includes a mosaic of habitats along the western edge of Milton Creek, such as saltmarsh, with sea purslane <i>Halimione portulacoides</i> and common saltmarsh-grass <i>Puccinellia maritima</i> co-dominant, although other species such as sea wormwood <i>Artemisia maritima</i>, sea lavender <i>Limonium vulgare</i>, sea aster <i>Aster tripolium</i> and scurvygrass <i>Cochlearia anglica</i> are quite common. A small amount of thrift <i>Armeria maritima</i> also occurs. Golden samphire <i>Inula crithmoides</i> is present along the banks all the way to Crown Quay.</p> <p>The site is also locally important for a number of bird species, with several Red Book Data species present; redshank <i>Tringa totanus</i> is the dominant winter wader. Other species of note within the LWS include grass snake <i>Natrix natrix</i>, slow worm <i>Anguis fragilis</i> and marsh frog <i>Rana ridibunda</i>, as well as several invertebrate species, such as the Holly blue <i>Celastrina argiolus</i>, common blue <i>Polyommatus icarus</i> and wall brown <i>Lasiommata megera</i> butterflies.</p>

3.3 Birds

There are 97 records of protected or notable bird species occurring within 2 km of the assessment boundary site over the last ten years. The majority of these are associated with statutory designated sites such as The Swale Ramsar, SPA and SSSI, or Milton Creek LWS (Table 3-1).

3.4 Intertidal Habitat

Aerial photography of the site (Figure 3-2) show isolated areas of saltmarsh habitat within the intertidal zone (e.g. LS.LMP.SM). This area of saltmarsh has previously been mapped by the Environment Agency as part of their WFD monitoring (Environment Agency, 2014). The area has expanded since mapped by the Environment Agency, indicating a degree of localised sediment accretion close to the outfall location. This saltmarsh colonisation and expansion is to be expected, given the extensive areas of saltmarsh habitats in the wider Swale and Medway Estuaries. It should be noted, however, that this area of saltmarsh only occurs within the boundary of the Swale Estuary MCZ (i.e. not within The Swale SSSI/Ramsar/SPA) and therefore is not a feature of any of the designated sites in the locality.

A pre-construction Phase 1 intertidal habitat site specific survey was undertaken by RPS on 11th April 2017 (RPS, 2017a), encompassing all intertidal habitats and associated floral and faunal assemblages to provide a robust characterisation of the proposed outfall location and surrounding area. A full description of this survey is presented in the Intertidal survey report submitted in the original ML application (MLA/2017/00316); including methods employed, description of the sediments and associated faunal species recorded, detailed mapping of the intertidal biotopes and conservation importance of the habitat mapped.

The survey recorded a number of intertidal biotopes across the intertidal, although the majority of the intertidal was dominated by intertidal sand and muddy sand (as represented by the LS.LSa.MuSa.MacAre biotope; Figure 3-2), which extended across most of the survey area. In the upper shore, in vicinity of the proposed outfall, areas of saltmarsh habitat were recorded, with pioneer saltmarsh species (i.e. cord-grass *Spartina anglica*) dominating most of these areas (represented by the LS.LMp.Sm biotope). Small patches of transitional saltmarsh habitat characterised by sea aster and sea purslane *Halimione portulacoides* were recorded in slightly raised areas of saltmarsh. A small patch of coarse sediment was also recorded in the lower intertidal. The remaining biotopes recorded were characteristic of rocky shore habitats, but as these were recorded on man-made structures (e.g. sea defences, construction debris and pipeline infrastructure in the intertidal), these were not considered of any conservation importance. Areas of barren shingle recorded in the upper intertidal were also not considered to have any significant ecological value, due to the lack of flora or fauna associated with these areas.

In addition to the above survey, a single pre-construction baseline survey of the saltmarsh habitat was carried out on 31st May 2018 (RPS, 2018). This was undertaken as a walkover survey of the habitats within and outside the impacted area following standard best practice methods described by the Joint Nature Conservation Committee (JNCC; 2004), including use of the National Vegetation Classification system (NVC) as described by Rodwell (2006). The field survey methodology developed for the NVC (see Rodwell, 2000 and JNCC, 2010) is considered the most appropriate for surveys that aim to provide a detailed vegetation map and identify changes over time.

The saltmarsh habitats are similar to those recorded in the previous survey in 2017. Cord-grass was the dominant saltmarsh plant on the mudflat and therefore the marsh is still considered to be at an early successional, or pioneer, stage (Tyler-Walters, 2001). This community is classified under the NVC system as SM6, *Spartina anglica* salt-marsh community. Small areas of sea aster and sea purslane were present on raised areas on the seaward end of the SM6 saltmarsh. This is characterised in Rodwell *et al.*, (2000) as transitional NVC habitat SM11 (*Aster tripofolium* salt-marsh community) which typically occurs between lower and upper marsh zones or as in this case on slightly raised ground in the lower marsh. The 2017 intertidal survey was found to have overestimated the extent of the SM11 habitat, and therefore the 2017 survey should be used as the baseline for assessment.

The saltmarsh recorded within the intertidal survey is not listed as a feature of any designated site in the Swale. Comparison of the saltmarsh extents mapped by the Environment Agency for the purposes of WFD

monitoring with the latest habitat mapping, strongly indicates that sediments in this part of the survey area are accreting and as a result the extent of saltmarsh habitat is increasing in this area.

Following the site-specific surveys, habitats of value were identified. These are intertidal sand and muddy sand, intertidal coarse sediments and saltmarsh habitats. Further assessment of these habitats can be found in Section 5.1.1.

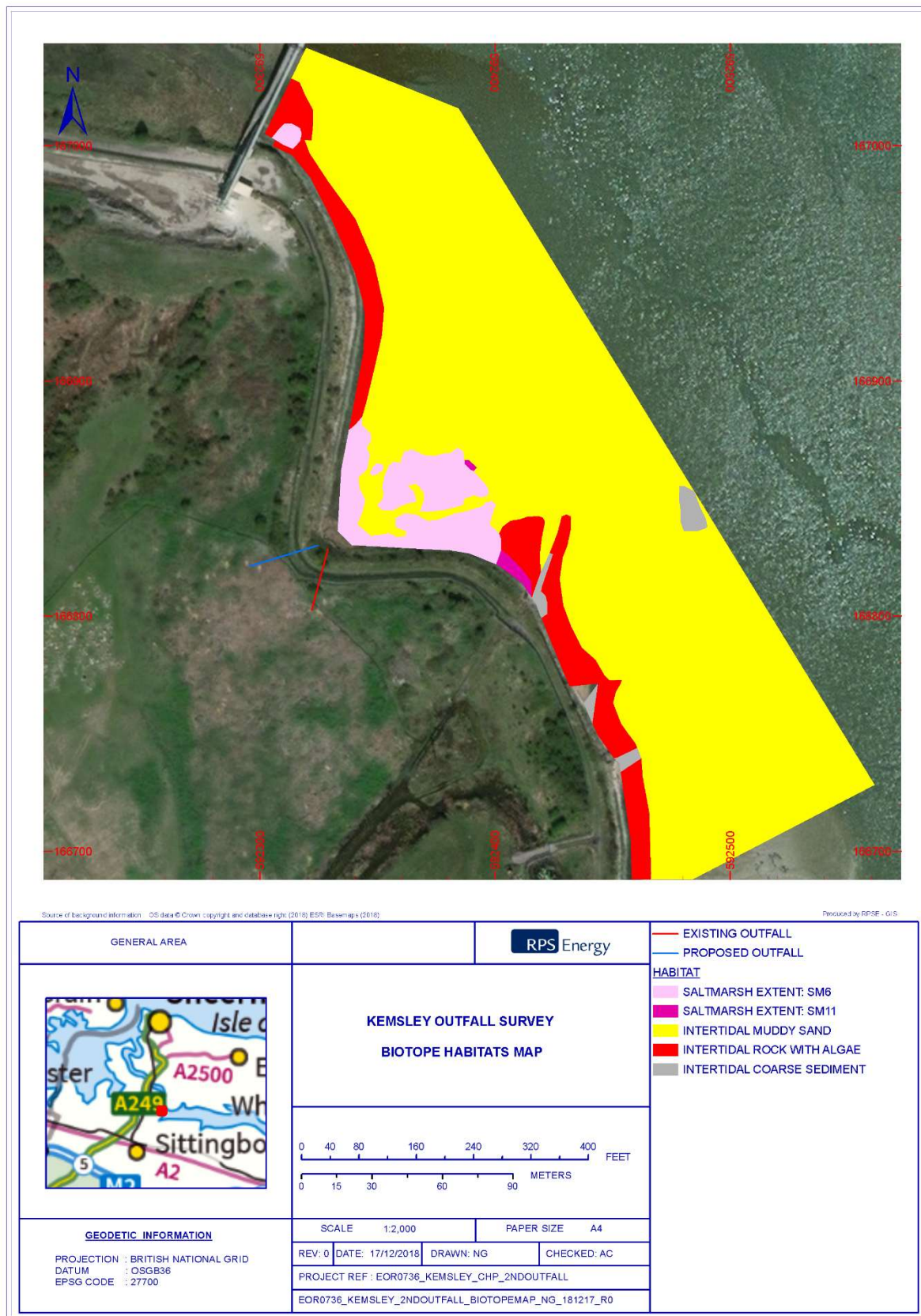


Figure 3-2: Intertidal biotope map from survey undertaken by RPS in 2017, updated with saltmarsh survey mapping from the pre-construction survey in May 2018.

4 Mitigation Measures

Full details of the Environmental Monitoring and Mitigation Plan (EMMP) can be found alongside the existing planning permission for the Generating Station (SW/10/444) (including pre-commencement mitigation which will be adhered to for this Development). This includes measures that relate to the loss of habitat during site clearance which were agreed with relevant stakeholders at the time of the original planning application. For the construction of this Development, no further mitigation is proposed beyond what was originally submitted within the EMMP.

5 Assessment of Effects

5.1 Approach

The following sections provide an assessment of the potential environmental impacts of the proposed Development during the construction phase in relation to the following environmental topics: designated sites, habitats, fish and breeding and overwintering birds.

Potential environmental impacts in relation to each of the environmental topics were identified through RPS experience gained through undertaking assessments for similar activities for the construction of infrastructure within sensitive habitats in the UK. Each assessment concludes whether the licensable activities are likely to result in a negligible, minor, moderate or major effect on the receptor. Likely ecological impacts the Development may potentially cause are:

- Temporary loss or disturbance of:
 - Natural or semi-natural habitats;
 - Habitat that supports species of conservation importance;
- Temporary disturbance to wildlife, e.g. from light pollution, human activity and vehicular movements, noise and vibration and overshadowing of bird habitats.

5.1.1 Receptor Sensitivity – Identification of Ecological Receptors

Several factors are taken into consideration when assessing the value of an ecological feature and whether it is considered important and therefore requires detailed assessment of potential impacts.

In assessing the value of habitats or species populations, a subjective assessment is made, based on a range of factors that influence overall ecological value. Amongst other factors, a series of criteria are considered for habitats and populations of species (Ratcliffe, 1977), including: fragility, rarity, extent, diversity, position in the landscape, naturalness, and recorded history. The legal protection of species is not a primary consideration in determining conservation value, but it is an important consideration in the impact assessment process.

Other resources that are used to inform the assessment of value and importance include but are not limited to:

- EU Directives;
- Habitats and Species of Principal Importance (Section 41);
- Birds of Conservation Concern (BoCC) Red and Amber lists (RSPB, 2015); and
- National and County Red Data Book species.

The resources used to assess the value and importance of features also helps to define the importance in the context of geographical scale. The CIEEM guidelines (2018) state that significance of effects of ecological features should be qualified with reference to the appropriate geographic scale. Therefore, to provide a framework that is consistent for both assessing the importance of ecological features and determining the significance of effects, the importance of ecological features is described at one of the following geographic scales:

- International;
- national;
- regional;
- local; and
- site and immediate surroundings.

While the current CIEEM guidelines discourage the use of a matrix with respect to impact assessment, this approach has been adopted here for the sake of consistency with the Kemsley Power Station ES (RPS, 2017d), with the CIEEM geographical scale included as far as possible within this method as set out in Table 5-1.

Table 5-1: Value of Ecological Receptors

Value of Ecological Receptors	Description
Negligible	<ul style="list-style-type: none"> • Including site level importance; and • Commonplace feature of little or no habitat/historical significance. Loss of such a feature would not be considered detrimental to the ecology of the area.
Low	<ul style="list-style-type: none"> • Including local importance; and • A feature (e.g. habitat or population) that is of nature conservation value in a local context only, with insufficient value to merit a formal nature conservation designation.
Medium	<ul style="list-style-type: none"> • Including regional or county importance; • A feature (e.g. habitat or population), which is either unique or sufficiently unusual to be considered as being of nature conservation value from a county to regional level; • Habitats or species that form part of the cited interest of a LNR, or some local-level designated sites, such as a LWS, also referred to as a non-statutory Site of Importance for Nature Conservation or the equivalent, e.g., Ancient Woodland designation; and • Presence of Local Biodiversity Action Plan habitats or species, where the action plan states that all areas of representative habitat or individuals of the species should be protected.
High	<ul style="list-style-type: none"> • Including national importance; • Habitats or species that form part of the cited interest within a nationally designated site, such as an SSSI or a NNR; • A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in a national context for which the site could potentially be designated as a SSSI; and • Presence of UKBAP habitats or species, where the action plan states that all areas of representative habitat or individuals of the species should be protected.
Very high	<ul style="list-style-type: none"> • Including international importance; • Habitats or species that form part of the cited interest within an internationally protected site, such as those designated under the Habitats Directive (e.g. SACs) or other international convention (e.g. Ramsar site); and • A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in an international/national context, such that the site is likely to be designated as a site of European importance (e.g. SAC).

For the purposes of the current assessment, the following intertidal receptors were identified in Section 3.4 (all other biotopes were considered to have negligible conservation value and are therefore not considered further):

- Intertidal sand and muddy sand (feature of the Swale Estuary MCZ; High value based on criteria in Table 5-1);
- Intertidal coarse sediments (features of the Swale Estuary MCZ; High value based on criteria in Table 5-1); and
- Saltmarsh habitats (area mapped is not within a designated site with saltmarsh as a listed feature; Medium value based on criteria in Table 5-1).

5.2 Designated Sites

5.2.1 The Swale Ramsar and SPA (very high value)

Habitat loss/disturbance

The Development will cause no direct impact to the Swale Ramsar and SPA via habitat loss, given no part of either designated site falls within the Development boundary. The nearest boundary of the Swale Ramsar and SPA is 0.15 km west to the Development boundary.

As outlined in section 3.4, there is limited saltmarsh habitat in the near vicinity of the outfall. Whilst overwintering bird species such as dark-bellied brent goose *Branta bernicla*, teal *Anas crecca*, oystercatcher *Haematopus* spp. and ringed plover *Charadrius hiaticula* have been found to prefer this habitat, it is highly unlikely that these bird species would be found on site given its limited extent and size compared to the rest of the SPA. An RPS (2017b) ornithology survey was carried out to determine the distribution, ranges and abundances of species within site. The results the survey found that using the Frost *et al.* (2016) 1% thresholds of international importance for identifying wintering birds that no peak counts of any species of conservation importance were within the Kemsley survey area.

The proposed Development site is highly unlikely to contain any bird species of conservation and >1% of the international wintering Ramsar/SPA cited species (RPS, 2017b). Therefore, any temporary habitat loss within the proposed development site will cause **no impact** on the SPA/Ramsar assemblage.

Light spill

There is potential for light spill from the construction site to impact the birds using the SPA/Ramsar. The light scheme will follow best practice to minimise light impacts. The construction will follow a full lighting plan.

It is considered likely that the magnitude of the impacts of changes to lighting during construction on a feature of very high value would be **negligible**. This would result in a **minor effect** and is therefore **not significant**.

Disturbance from people and plant movements

The movement of people and plant during the construction phase of the Development may be visible to a small proportion of the SPA cited bird species using the intertidal areas of the SPA/Ramsar. It is considered there is a limited potential for disturbance of birds using the intertidal areas to be caused by people when account is taken of the fact that:

- The SPA cited bird species feeding on the intertidal area adjacent to the proposed Development are already habituated to people using the Knauf Jetty (to the north east of the Development site), industrial areas behind the seawall and public footpath along the seawall itself;
- The bird distribution studies have shown the limited presence of SPA/Ramsar cited bird species on the intertidal area with the proposed Development (RPS 2017b). The majority of SPA/Ramsar cited bird species on the intertidal area during all phases of the tide will be screened from people movement by the installation of a heras panel fencing, Earth berm, topographical features and the opposite bank and its features of the River Swale are over 100 m from the proposed area of construction and separated by the river channel; and
- Estimated total time for the construction of the Development is ten weeks, which represents a short term intermittent impact.

Therefore, it is not anticipated that SPA cited birds using the intertidal areas of the Swale will be greatly disturbed by plant or people movement during the construction phase of the development.

The S106 Agreement for the consented Generating Station included the requirement to create a new reedbed at Hartey Fen on the Isle of Sheppey as part of the RSPB's habitat creation scheme to return farmland to grazing marsh and associated habitats (including reedbed). This was intended to provide alternative breeding habitat, should and bird species choose to abandon the area.

Such a reedbed has been created and signed off as complete by the RSPB and is an available habitat area. Communications with RSPB, via Nick Grundy (RPS), has reported that the reedbed is establishing well.

It is considered likely that the magnitude of the impacts of disturbance during construction on a feature of very high value would be **negligible**. This would result in a **minor effect** and is therefore **not significant**.

Recreational disturbance

The potential for disturbance to SPA/Ramsar cited bird species from recreational activity by the construction staff is considered low. Whilst there is an access route via the path adjacent to the Development, there is no current use of this access route by staff in the surrounding area. The operational nature and characteristics of the consented Generating Station mean access is restricted and measures are already in place to prevent incursion outside of defined areas. Therefore, it is not anticipated that any of the construction staff will access the Swale SPA.

There will be no impact from recreational disturbance from members of the public, as there is no public access via the site.

It is considered likely that the magnitude of the impacts of recreational disturbance during construction on a feature of very high value would be **negligible**. This would result in a **minor effect** and is therefore **not significant**.

Noise

Noise created during the construction phase from vibro hammer piling works, heavy goods vehicles (HGV) movements and other plant activities has the potential to disturb birds wintering within the SPA/Ramsar, causing them to cease feeding or fly away from the area of influence. It is recognised that loud and 'percussive' noises have the greatest potential to cause disturbance and a threshold has been identified from the published scientific literature of 80 dB L_{Amax}. The main intertidal areas of the Swale Ramsar/SPA used by wintering citation birds recorded by the foreshore monitoring are over 200 m from the areas of the Development where significant noise events may occur (RPS 2017b). Since all sheet piling is to be installed via vibro hammer, it is considered highly unlikely that any effects due to noise disturbance would occur for intertidal species.

Marsh harrier using the reedbed to the north of the Development are closer to potentially-disturbing noises, the most frequent of which is likely to be from lorry reversing signals. Therefore, suitable modelling of the noise likely to be generated from the reversing signal of lorries working on site has been undertaken. Noise levels were calculated for the Generating Station and found for a height of 2 m above ground level (AGL), using the software package SoundPLAN Version 7.4. Propagation was predicted following the methodology in International Standard ISO 9613-2:1996, using standard atmospheric conditions (10°C; 70% Rh). The noise source (an HGV reverse alarm) has been modelled as a point at 1.5 m AGL, with an L_{Amax} level equivalent to a sound power level of 105 dB L_{WA}. Local topographical data and building information has been included as based on publicly available Ordnance Survey 'Open Data'. The resulting data indicated that the maximum noise levels expected to be experienced by the marsh harrier are no more than 55 dB L_{Amax} with less than 40 dB L_{Amax} at any intertidal habitat. As a result, no effect is predicted due to construction noise.

It is considered likely that the magnitude of the impacts of noise during construction on a feature of very high value would be **negligible**. This would result in a **minor effect** and is therefore **not significant**.

Flight lines

RPS (2017) ornithology survey observations as part of the intertidal bird surveys and general observations on site during the breeding bird survey have shown that the main flight lines for SPA/Ramsar species near the Development are offshore, with no waterbirds being noted to fly over the proposed Development in any of the January-May and July-December 2016 surveys completed. The surrounding area is already heavily industrialised, and areas of conurbation exist to the west, thus making it unlikely that waterbirds would pass through the Development on route to other wetland areas such as the Medway Estuary. As the Development

lies entirely on the estuary side of the sea wall and whilst birds may fly over the site, the total area of the Development and activity does not represent a significant deterrent to flying birds, and as such will have a negligible effect on the flight lines of SPA/Ramsar birds using the Swale.

Therefore, the magnitude of the impact of changes to flight lines during construction on a feature of very high value, would be **negligible**. This would result in a **minor effect** and is therefore **not significant**.

5.2.2 Swale Estuary MCZ (high value)

Habitat loss/disturbance

The Development will result in temporary loss or disturbance of intertidal habitats, including the intertidal sand and muddy sand habitat feature of the MCZ during the construction phase. Temporary habitat loss will largely be confined to the construction area around the Development. Construction methodologies can be found in Section 2.3. A safe working area will be established within which all construction operations will take place, to protect the works area from tidal influence and to limit the potential for contaminants to escape into the marine environment during the construction phase. This would also prevent increases in suspended sediment concentrations (SSC) to the Swale during excavation operations within the earth berm (e.g. during installation of the outfall pipe or associated Reno matting). The proposed methodology is to install an earth berm formed of an inert material, such as clay, in the intertidal. Construction of the outfall is predicted to be undertaken over a period of up to 10 weeks. Following construction, all construction material (e.g. earth berm) will be removed from the intertidal and sediments/habitats and associated communities will be allowed to recover naturally.

For the purposes of this assessment, the maximum adverse scenario is for an intertidal working area covering an area of approximately 50 m x 50 m, although this is likely to be a conservative estimate, with habitat loss/disturbance occurring within this entire construction area (i.e. 2,500 m²). Much of this temporary habitat loss will affect the pioneer saltmarsh which dominates the intertidal in the immediate vicinity of the outfall.

An earth berm will be used to separate the working area from tidal influence. There is potential for some temporary disturbance of the earth berm, as a result of tidal and wave action eroding the foot of the berm, resulting in localised dispersal of clay (or similar material) particles. Due to the location of the working area in the upper shore, this would only be expected to occur at high tide during spring tides and therefore only for a few hours around high tide. It is expected that this would affect only a small proportion of designated habitats with any potential effects limited to within a few metres of the earth berm. Any effects on intertidal communities would also be expected to be limited, as the baseline habitats are characterised by muddy sand sediments, with many of the characterising species (e.g. *Hediste diversicolor*) also known to occur in muddy sediments. Clay particles on the sediment surface would also be dispersed over subsequent high tide periods, with sediments returning to baseline conditions soon after removal of the earth berm. Following completion of installation of the outfall pipe, the earth berm would be completely removed. This will result in the removal of some of the surface sediments (i.e. a few cm) to ensure all material installed during the construction phase are removed. Following removal of the earth berm, sediments would be expected to return to baseline condition, with subsequent recovery of associated communities.

Recovery rates for communities associated with intertidal sand and muddy sand sediments are expected to be fast following disturbance (i.e. during the construction phase). Characterising species (e.g. *H. diversicolor* and *Macoma balthica*) show high recoverability following disturbance (MESL, 2002; Budd and Rayment, 2001; Tillin and Rayment, 2016; Ashley, 2016) and providing the sediments are returned to the pre-construction state, these would be expected to recover fully within one year following construction. In addition, the area affected by temporary habitat loss/disturbance is expected to be small in the context of the available habitats within the survey area and the wider Swale Estuary MCZ. No effects of habitat loss/disturbance are predicted for all other MCZ features, including intertidal coarse sediments. Effects on saltmarsh habitats which are not a feature of the Swale Estuary MCZ, are presented in Section 5.3.

Due to the small scale of habitat loss/disturbance effects, the reversible nature of the impact and the high recovery potential of associated communities, it is considered that the magnitude of the impact of construction related habitat loss from the development on the features of the Swale Estuary MCZ (a high value receptor) would be **minor**. This would result in an effect of **minor significance** which is **not significant** in EIA terms.

5.2.3 Swale SSSI (high value)

The development will cause no direct impact to the Swale SSSI via habitat loss, given no part of the SSSI falls within the Development boundary. However, the Swale SSSI is 0.14 km to the Development boundary.

The Development drains eastwards into the Swale Estuary and therefore there is potential for impact on the SSSI (Figure 3-1). Whilst changes to the drainage network are proposed, mechanisms will be implemented to avoid any pollution/incidents in accordance with legislative requirements and Environment Agency guidance.

There is potential for light spill from the construction site to impact the birds using the SSSI; however, as described above for the SPA, all good-practice methods to limit construction light spill have been adopted. Therefore, it is considered likely that the magnitude of the impacts of changes to lighting during construction on a feature of high value would be **negligible**. This would result in a minor effect and is therefore **not significant**.

Noise created during the construction phase has the potential to disturb birds causing them to cease feeding or fly away from the area of influence. The assessment of construction noise on the SSSI is detailed in the SPA impact assessment Section 5.2.1 above.

The issues dealing with impacts to wintering waterbirds have been discussed previously with relation to the Swale Ramsar/SPA (Section 5.2.1 above).

It is considered likely that the magnitude of the impacts of the development on this feature of high value, would be **negligible**. This would result in a **minor effect** which is **not significant**.

5.2.4 Elmley Island NNR (high value)

Elmley Island NNR is located approximately 0.377 km west to the Development on the other side of the Swale.

Elmley Island NNR is important for large numbers of wintering waterfowl and for birds of prey. Many different bird species also breed at Elmley Island. The watercourses, seasonally wet grassland and saltmarsh are also important for invertebrates and plants.

The only potential impacts to Elmley Island NNR from the construction phase would be noise. However, the distances involved, and the intervening Swale make this impact negligible.

It is considered likely that the magnitude of the impacts of the development on this feature of high value would be **negligible**. This would result in a **minor effect** which is **not significant**.

5.2.5 Milton Creek Local Wildlife Site (medium value)

Milton Creek Local Wildlife Site (LWS) contains a mosaic of habitats including saltmarsh, larger areas of rougher, unmanaged grassland, some unimproved pasture, and freshwater dykes with good aquatic and marginal flora. Although not designated as such due to the high levels of pollution present in the sediment from previous industrial activities, Milton Creek forms an extension to the Swale SPA. Given this level of pollution, it is only considered to be of medium value.

Habitat loss/disturbance

No part of the LWS falls within the assessment boundary, therefore there will be no direct impact on Milton Creek via habitat loss. The effect of the habitat loss on this LWS would be 'no change'.

Light spill

There is potential for light spill from the construction site to impact the Swale SPA citation birds using Milton Creek. As described above for the Swale SPA, the light scheme for the construction phase will follow best practice to minimise light impacts.

Given Milton Creek is over 0.33 km from the Development boundary, there would be no impact to the LWS from changes to light levels. The resulting effect would therefore be 'no change'.

Disturbance from people and plant movements

The movement of people and plant during the construction phase of the Development which may be visible to a small proportion of the SPA cited bird species using the intertidal areas of Milton Creek. It is considered there is a limited potential for disturbance to be caused by people when account is taken of the fact that:

- The bird distribution studies have shown the limited presence of SPA/Ramsar cited/review bird species on the intertidal area adjacent to the Development site; and
- The bird species feeding on the intertidal area adjacent and within the Development site are already habituated to people.

Therefore, it is not anticipated that SPA cited/review birds will be disturbed by plant or people movement during the construction phase of the Development.

Noise

Noise created during the construction phase from vibro-hammer piling works, HGV movements and other plant activities has the potential to disturb birds wintering within Milton Creek, causing them to cease feeding or fly away from the area of influence. It is recognised that loud and 'percussive' noises have the greatest potential to cause disturbance and a threshold has been identified from the published scientific literature of 80dB L_{Amax} . The main intertidal areas of Milton Creek used by wintering citation birds from the Swale SPA recorded by the foreshore monitoring are at their closest point over 0.33 km from the areas of the Development where significant noise events will occur.

Pilling will be undertaken outside of the wintering bird season. As a result, no effect is predicted due to construction noise.

Overall, therefore, it is considered likely that the impacts of the Development on this feature of medium value, would be of **negligible** magnitude. This would result in a **negligible effect** and is therefore of **not significant**.

5.3 Habitats

5.3.1 Intertidal saltmarsh (medium value)

As detailed in Section 5.2.2, construction of the Development is predicted to result in temporary habitat loss/disturbance in the intertidal zone. This is expected to include temporary loss/disturbance of intertidal saltmarsh habitats and associated species from construction activities, possibly including movement of machinery and equipment in the intertidal, construction of an intertidal working compound separated from tidal influence (e.g. earth berm) or excavation of intertidal sediments/saltmarsh during installation of the outfall or Reno matting. It is assumed that construction operations will be undertaken within an area of up to 2,500 m², with temporary habitat loss/disturbance occurring within this entire area. Most of this loss will occur within the pioneer saltmarsh habitat, which dominated the area around the Development.

The saltmarsh communities recorded in the vicinity of the outfall, were comprised of pioneer saltmarsh species, primarily cord grass (see Section 3.4). As many of the characterising species are pioneer species, these would be expected to recolonise the sediment quickly following cessation of construction activities, provided the sediments are returned to a pre-construction state (i.e. removal of all construction equipment etc.). Pioneer species including *Salicornia* sp. and sea aster would be expected to recolonise these areas quickly, whereas *Spartina* sp. will depend on transport of plant fragments and seed (Tyler-Walters, 2001), although given the extensive areas of saltmarsh in the immediate vicinity of the proposed outfall location and in the wider Swale, this is likely to occur quickly. Monitoring of saltmarsh recovery at the Thanet offshore wind farm landfall demonstrated that pioneer saltmarsh species recolonised in the majority of affected areas within six months of cessation of works (Royal Haskoning, 2010). There is evidence that this area of saltmarsh has been expanding in recent years, suggesting that sediments are accreting in this area, providing a suitable habitat for saltmarsh plants to colonise.

Due to the small scale of habitat loss/disturbance effects (0.005% of the Swale MCZ area, see Table 3-1), the reversible nature of the impact and the high recovery potential of the associated communities, it is considered that the magnitude of the impact of construction related habitat loss from the development on saltmarsh habitats (a medium value receptor) would be **minor**. This would result in an effect of **minor significance** which is **not significant** in EIA terms.

5.4 Fish species (medium value)

As detailed in Section 3.4, the Swale is known to host a number of fish species, including providing nursery habitat for commercially important species (e.g. herring, plaice, common sole, whiting and thornback ray). Migratory species, including European smelt, may also pass through the Swale on their way to spawning grounds in freshwater. Construction operations may impact on fish species through loss of intertidal habitats or through increased underwater noise levels which may result in injury or behavioural effects.

Habitat loss/disturbance

Intertidal mudflats and saltmarsh habitats are used during high tide periods by both adult and juvenile fish for feeding habitats or to avoid predation from larger fish species in deeper, subtidal areas (Green *et al.*, 2012). As detailed in Section 3.4 and Section 5.3, habitat loss effects are expected to be limited in extent (particularly in the context of the widespread nature of these habitats in the Swale), with full recovery of these following cessation of construction operations. Due to the small scale of habitat loss effects, the majority of which will be reversible, it is considered that the magnitude of the impact of construction related habitat loss on fish species (medium value receptors) would be **negligible**. This would result in an effect of **negligible** significance (i.e. not significant in EIA terms).

Underwater noise

Underwater noise from construction operations may result in effects on fish populations in the Swale. Sheet piling will be installed which will enclose the intertidal working area. A vibro-hammer is expected to be used to install sheet piles over a period of two weeks at the beginning of the construction phase. It is intended that the sheet piling will be installed/vibro-piled during the dry rather than wet, therefore minimising any potential for noise impacts on fish species.

An important characteristic of sound is its frequency, described as the number of oscillations per second, the unit of frequency being the Hz with fish species expected to be most sensitive to frequencies of 100 Hz to 1,000 Hz (Thomsen *et al.*, 2006). The amplitude of the sound can be described in terms of the sound pressure, where the unit of pressure is the pascal (Pa), however, by convention sound levels are expressed in decibels (dB) relative to a reference pressure, which is 1 μ Pa for underwater sound. Sound Pressure Level (SPL) is a common metric in underwater acoustics and, by convention, is expressed as a root mean square (RMS) value, which is most useful to describe the level of a continuous type noise source such as vibro-piling or shipping noise.

Vibro-piling generates continuous broadband sound and sound levels associated with vibratory driven sheet piling have been measured in water approximately 12 to 14 m deep as approximately 173 dB RMS re μ Pa m at frequencies of 400 to 2,500 Hz (Illinworth and Rodkin, 2007). Although considerable variation will occur because of the specific location and equipment used, based on the above, installation of the sheet piling using vibro-piling may not generate underwater sound levels significantly greater in magnitude than an individual small watercraft, although the overall duration of noise associated with vibro-piling would potentially be longer in any given day. This is supported by noise monitoring during vibro-piling at Red Funnel's Southampton Terminal in Southampton Water, where source levels of the vibro-hammer could not be discerned from the background level of vessel noise (approximately 150 dB re 1 μ Pa) in the area (Nedwell *et al.*, 2003). Piling would be expected to be a short term and intermittent noise source, with piling only likely to occur during daylight hours.

For fish, the most relevant criteria for injury and behavioural responses are those contained in the recent Sound Exposure Guidelines for Fishes and Sea Turtles (Popper *et al.*, 2014). The guidelines set out criteria for injury due to different sources of noise, including piling noise, although based on the expected noise levels from vibro-piling as discussed above, potential injury would only be expected in extremely proximity to piling operations, should these occur at all. Potential for injury effects are therefore expected to be very low.

Behavioural effects may be expected because of sheet piling during installation at the beginning of the intertidal construction phase, with such effects including startle responses, strong avoidance behaviour, changes in swimming or schooling behaviour or other subtler changes in behaviour (e.g. see Mueller Blenke *et al.*, 2010; Pearson *et al.*, 1992; McCauley *et al.*, 2000). There are no specific criteria for assessing behavioural effects of underwater noise as only a small number of studies have been undertaken and these have not allowed for robust conclusions to be made with respect to the effects of underwater noise on

behaviour. In addition, fish responses to noise are likely to vary considerably based on the type of fish, sex, life history stage (juvenile fish may respond to lower noise levels) or the reasons or drivers for fish being in the area (e.g. fish which are feeding or migrating may be more motivated to remain in a particular area when exposed to a noise source; see Peña *et al.*, 2013). Should behavioural effects occur at all as a result of the expected noise levels associated with vibro-piling, fish may redistribute to other parts of the Swale and following cessation of noise generating construction activities, fish behaviour would be expected to quickly return to baseline levels (McCauley *et al.*, 2000). Due to the low level of noise predicted from vibro-piling, no significant barrier effects to migrating smelt would be expected to occur during the construction phase.

Due to the short term and intermittent nature of the underwater noise impacts and the relatively low noise levels expected from vibro-piling operations, the magnitude of the impact on fish populations (medium value receptors) is predicted to be **minor**. It is predicted that the effect will be of **minor significance**, which is **not significant** in EIA terms.

5.5 Breeding birds: Non-SPA (Low value)

Habitat loss/disturbance

There is currently very little suitable habitat within the Development to support breeding birds. Off site, the reedbed to the north of the development supported the majority of breeding birds. The resulting effect would therefore be 'no change'. Leading to a **negligible** effect which is **not significant**.

Light spill

There is potential for light spill from the construction site to impact the breeding birds using the adjacent reedbed habitat. The light scheme for the construction phase will follow best practice and the CMS to minimise light impacts.

Given the key reedbed area is at its closest point 160 m from the Development, the magnitude of the impact on this feature of low value is **negligible**. This would lead to a **negligible** effect which is **not significant**.

Disturbance from people and plants movements

The movement of people and plant during the construction phase has potential to cause visual disturbance to nesting birds. Identifying the impact on different species and individuals is difficult as their tolerance to visual disturbance and their ability to habituate will vary. Again, these impacts are only likely to be significant within the habitats where Schedule 1 species are found to usually nest i.e. the reedbeds to the west and north west.

Therefore, the magnitude of the impact of disturbance from people and plant movement on this feature of low value is **negligible**. The effect would be assessed as **minor** and is therefore **not significant**.

Noise

Noise created during the construction phase has the potential to disturb breeding birds causing them to cease feeding or fly away from the area of influence. It is recognised that short, sharp 'percussive' noises have the greatest potential to cause disturbance.

Noise created during the construction phase from HGV movements and other plant activities has the potential to disturb birds breeding in the area to cause them to fail to establish a breeding territory or abandon their attendance at a nest. It is recognised that loud and 'percussive' noises have the greatest potential to cause disturbance and a threshold has been identified from the published scientific literature of 80dB L_{Amax} .

The nearest significant area of habitat for nesting birds is the reedbed to the west and north west of the Development.

The nearest Wildlife and Countryside Act 1981 Schedule 1 bird species (Cetti's warbler).

The Hartey Fen habitat (s106 agreement) created for the Generating Station, once considered, it is likely that the magnitude of impacts of noise on the breeding bird assemblage of low value, would be would be **negligible**. The effect would be assessed **negligible/minor** and therefore is **not significant**.

6 Cumulative Effects

The purpose of this section is to assess the cumulative effects of the Development, with other developments proposed near the Development site that are currently in the planning process or have been approved but are not yet constructed. The potential for cumulative effects with other projects has been assessed in the Generating Station ML (MLA/2017/00316) application and concluded no significant cumulative effects. However, no assessment has been made of the Generating Station's existing outfall and the potential for cumulative effects to occur with the Development.

The proposed Development and the Generating Station's existing outfall is assessed based on the development impacts resulting in residual effects for the same habitats, species and populations as those occurring at the Development site.

Given the spatial and temporal overlap of the Generating Station consented outfall from the Development (4.63 m apart), potential cumulative impacts with the Development could occur to the Swale MCZ, this assessment has been covered in Section 7.

6.1 SW/10/444 – Kemsley Paper Mill Sustainable K3 Generating Station (the Generating Station)

The consented Generating Station outfall has been described in Section 1.1 and has spatial (4.63 m apart) with the Development. The Generating Station's construction methodology is identical to that proposed for the Development. Cumulative effects to the existing saltmarsh could occur via increased sedimentation, disturbance and temporary habitat loss during construction. This may lead to a prolonged period of recovery for the habitats. A detailed consideration of these impacts has been provided within this ML application.

6.1.1 Designated Sites

Both projects lie near the same designated sites, a detailed consideration of the impacts has been provided within Section 5.2; impacts for the Generating Station outfall are identical. Following the reasoning presented in that assessment, it is possible that prolonged construction activity with the Development could make habitat (see Section 3.4) unattractive to species associated with the designated sites (i.e. birds of conservation importance) during the construction phase of both projects. However, considering existing mitigation implemented under the S106 agreement (1 ha of new reedbed habitat on the Isle of Sheppey to provide alternative habitat during the Development), it is considered that this is sufficient mitigation for any further disturbance associated with the Development when considered cumulative with the Generating Station outfall.

Habitats of value within the MCZ, as described in Table 5-1, have been discussed further with Section 7.

6.1.2 Habitats

As outlined in Section 5.3, construction of the Development is likely to have a temporary habitat take of less than 0.005% of intertidal habitat during the construction phase. The Generating Station existing outfall is also expected to affect less than 0.005% of this habitat, totalling 0.01% of the total intertidal habitat in the Swale Estuary MCZ. Whilst there is no temporal overlap in the construction phase of the two projects, there will be an effect to pioneering species present during recovery of the existing outfall following construction works. With the construction of the new Development, it is expected that this recovering habitat will be affected by the temporary habitat take. However, due to the recoverability of the habitat and likelihood of pioneering species (i.e. cord-grass) nearby to seed the site, it can be expected that no long term cumulative effect will arise. In addition, monitoring surveys (Section 9) is in place to determine the recovery of intertidal communities in the area.

6.1.3 Fish

Both projects are expected to result in temporary habitat loss during the construction phase. However, there is no temporal overlap with the construction of the two projects and as such no cumulative effects are expected to occur. As stated in Section 5.4, habitat is expected to recover, and the associated species follow cessation of all construction works.

6.1.4 Breeding Birds

Where the two projects are located, there is very little suitable habitat within the Development to support breeding birds. All construction works are expected to follow best practice to minimise impacts to breeding birds. Mitigation outlined in Section 6.1.1 is expected provide suitable breeding habitat for any bird species. Therefore, no cumulative effects can be expected.

7 Marine Conservation Zone Assessment

Construction of the proposed outfall for the Development will be completed within the boundary of the Swale Estuary MCZ and therefore there is potential for effects on the protected features of this MCZ and European smelt, a species which may be included as a feature of this MCZ in the future (see Section 3.2 for baseline). Effects of construction of the Development on the features of the Swale Estuary MCZ are considered in Section 5.2.2. This considered the effects of temporary habitat loss/disturbance on the sand and muddy sand feature of the MCZ and concluded that any effect would be short term, of limited spatial extent (0.0005%) (particularly in the context of the extent of the sand and muddy sand habitat feature of the MCZ) with rapid recovery of faunal communities expected following completion of construction. The effect was predicted to be of minor significance, which was not significant in EIA terms. In addition, the cumulative assessment found that the Development and the Generating Station was found to have no long-term effects to the intertidal community (see Section 6.1.2)

Effects of construction on European smelt (and other fish species) were also assessed, including temporary habitat loss/disturbance and noise impacts. Effects of temporary habitat loss (see Section 5.4) were predicted to be highly limited in extent, particularly in the context of the available habitats in the wider Swale Estuary, temporary and reversible following construction operations. Effects were predicted to be of negligible significance which was not significant in EIA terms. No cumulative effects of both the Development and Generating Station are expected as neither project temporally overlaps during the construction phase of the projects.

Underwater noise effects on fish (see Section 5.4) were also expected to be limited in extent and intermittent. There was very low risk of injury to fish species and behavioural effects (should they occur at all) were predicted to occur over a very small range from the proposed outfall location, with low risk of any barrier effects on fish migrating through the Swale Estuary. Any noise disturbance would also be short term and intermittent. Effects on fish species, including European smelt, were predicted to be of minor significance which was not significant in EIA terms. Cumulative effects have not been assessed as there is no temporal overlap with the construction phases of either projects.

It can therefore be concluded that the construction of the Development and cumulatively with the Generating Station, will not significantly affect the conservation objectives of the protected features of the Swale Estuary MCZ. It can also be concluded that these activities will not affect the ecological or geomorphological processes on which the conservation objectives of the protected features of the Swale Estuary MCZ are dependent.

8 Water Framework Directive Assessment

The Development is proposed for construction within the Swale transitional water body adjacent to the existing Generating Station outfall, whereby a WFD assessment has been submitted alongside the ML (MLA/2017/00316) application. Given the proximity of the Development to the existing outfall, identical construction methods and impacts to sensitive receptors; it is considered that any further impacts to the Swale transition water body would be as per the assessment presented in the original application i.e. will be negligible and have no potential for deterioration of the WFD objectives for the site. Therefore, no WFD assessment has been carried out. This approach was confirmed in consultation with MMO, which confirmed that no WFD assessment is required for submission alongside this ML variation application (Section 1.2).

9 Monitoring

To assess the impact of the construction phase of the existing outfall and the Development, a pre-construction saltmarsh survey (RPS, 2018) has been undertaken to characterise the area prior to the construction of the Generating Station outfall. A post construction monitoring survey for the Generating Station is planned for 2019, which will also act as a pre-construction survey for the Development. This post/pre-construction monitoring survey will allow for the characterisation of the recovered saltmarsh and intertidal area; to determine the recoverability of the area (i.e. pioneering colonisation by *Salicornia* sp. and sea aster (See Section 5.3.1)). Following this a further post construction survey will be carried out upon completion of the Development to assess the habitat loss and recoverability of the intertidal habitat.

10 Summary of Effects

The residual effects of the proposed Development once the above mitigation (i.e. Hartey Fen habitat) measures have been applied are summarised in Table 10-1 below. No significant residual impacts have been identified for the any of the ecological resources identified on or near the site.

Table 10-1: Significance of Residual Impacts

Description of receptor	Value of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant
Swale Ramsar and SPA	Very high	Habitat loss	Long term	Negligible	Minor	Not significant
		Lighting	Short term	Negligible	Minor	Not significant
		Disturbance from people and plant movements	Short term	Negligible	Minor	Not significant
		Recreational disturbance	Short term	Negligible	Minor	Not significant
		Noise	Short term	Negligible	Minor	Not significant
		Flight lines	Short term	Negligible	Minor	Not significant
Swale Marine Conservation Zone	High	Habitat loss	Short term	Minor	Minor	Not significant
Elmley Island NNR	High	Noise	Short term	Negligible	Not significant	Not significant
Milton Creek LWS	Medium	Habitat loss	Long term	Negligible	Not significant	Not significant
		Lighting	Short term	Negligible	Not significant	Not significant
		Disturbance from people and plant movements	Short term	Negligible	Not significant	Not significant
		Noise	Short term	Negligible	Not significant	Not significant
Intertidal saltmarsh	Medium	Lighting	Short term	Negligible	Not significant	Not significant

Description of receptor	Value of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant
Fish species	Medium	Habitat loss	Long term	Negligible	Not significant	Not significant
		Underwater Noise	Short term	Negligible	Not significant	Not significant
Breeding birds: Non-SPA	Low	Habitat loss	Long term	Negligible	Not significant	Not significant
		Lighting	Short term	Negligible	Not significant	Not significant
		Disturbance from people and plant movements	Short term	Negligible	Not significant	Not significant
		Noise	Short term	Negligible	Not significant	Not significant

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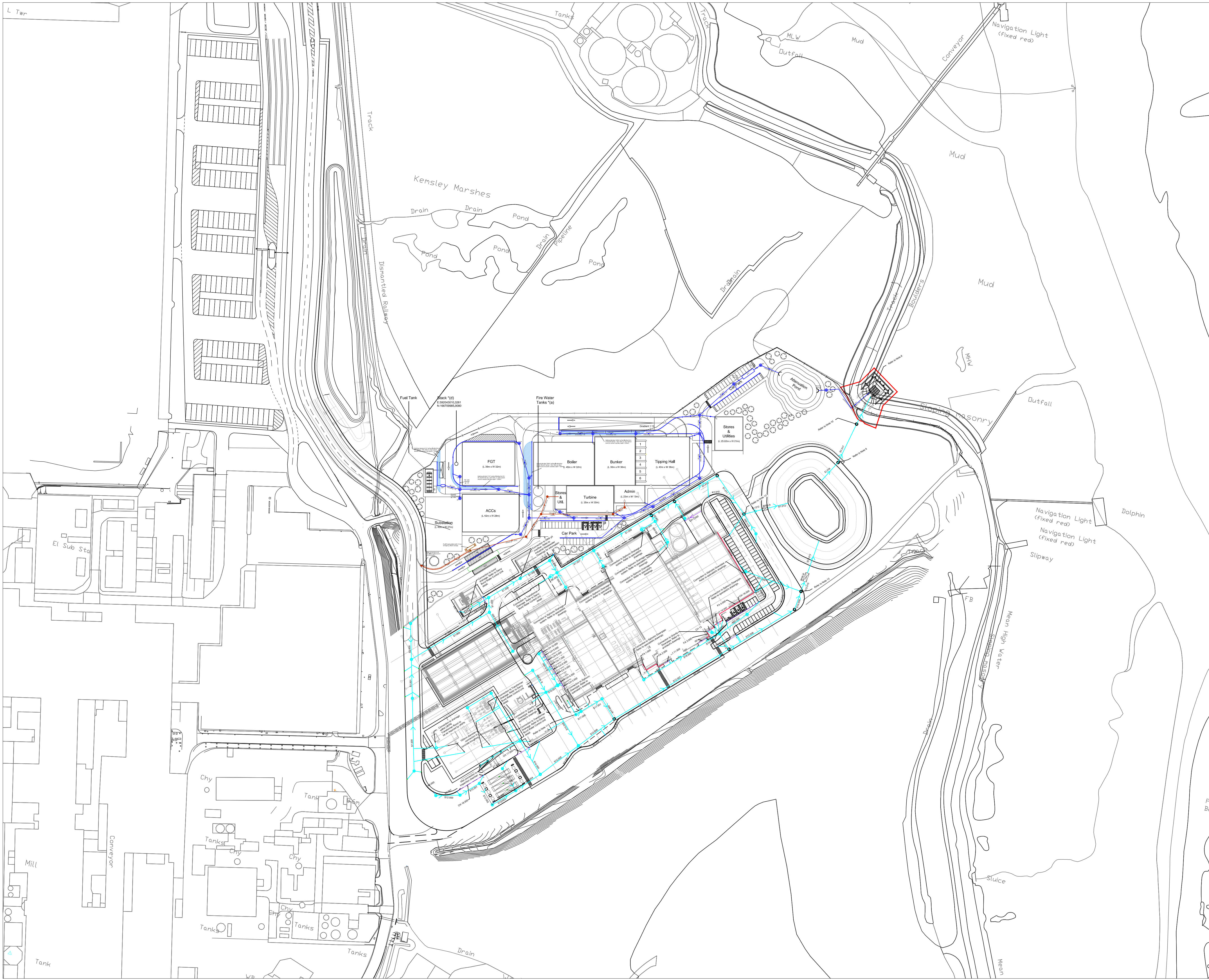
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- Key:
- ***mmØ @ 1.*** FW Drain (ID & Gradient)
 - ***mmØ @ 1.*** SW Drain (ID & Gradient)
 - FW HDPE Rising Main
 - F1 FW Manhole
 - S2 SW Manhole
 - FW Pumping Station
 - o RWP Rainwater Pipe (c/w RE)
 - o SDP Syphonic Primary Downpipe
 - Linear Drainage e.g. Kerb/Slot Drain
 - Headwall
 - RT1 Proprietary Oil Interceptor Unit
 - Application boundary

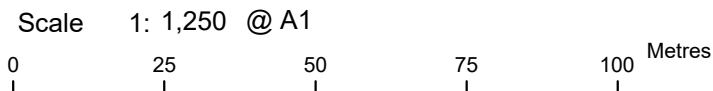
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Wheelabrator Kemsley

Kemsley WKN

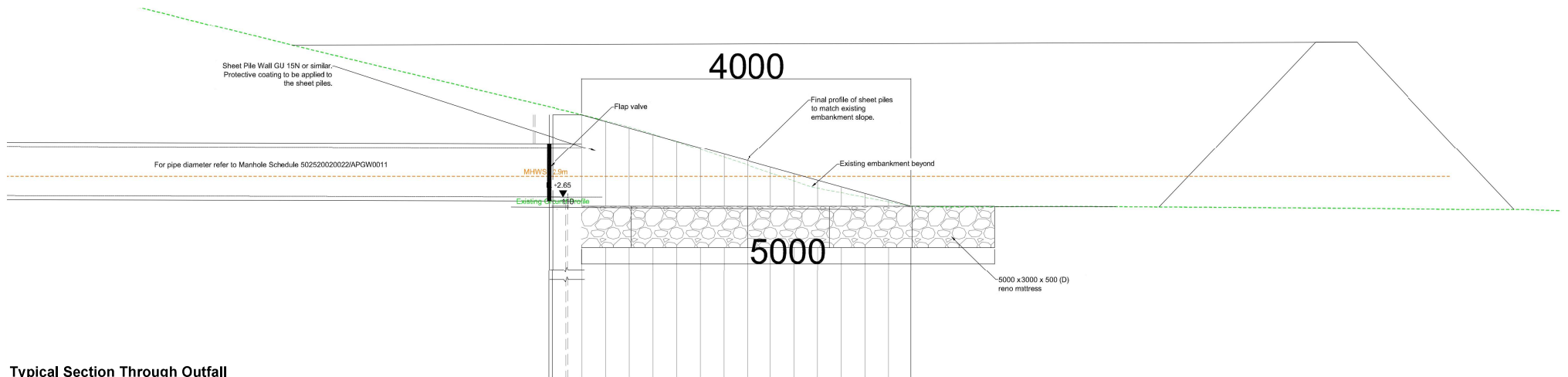
Outfall Marine License Application - Location Plan



Date: January 2019
Author: C.Rouse

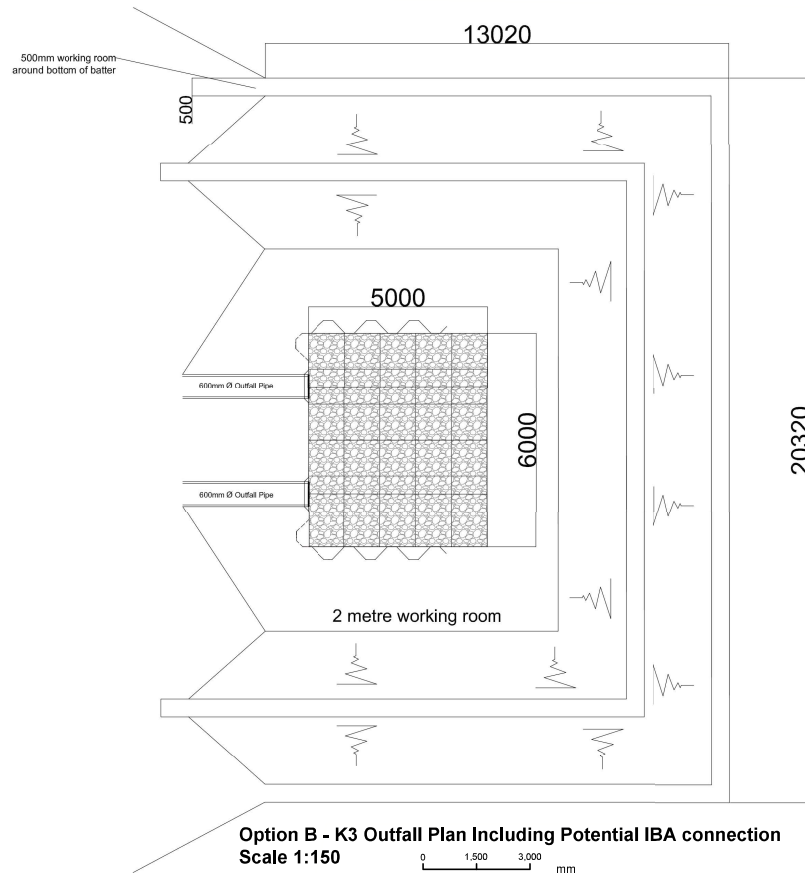
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Typical Section Through Outfall
Scale 1:50

0 500 1,000 mm



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**Wheelabrator Kemsley Generating
Station Power Upgrade**

Outfall Marine License Application

Title **Proposed Plans and Section
Option B**

Status	Drawn By	PM/Checked by
FINAL	RM	JB
Job Ref	Scale @ A3	Date Created
OXF9163	Various	Aug 2017

Figure Number
2b

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Kemsley K3 CHP Project

Attenuation Pond Outfall to Swale Estuary



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Project Description

Clugston Construction have been engaged to carry out the civil construction works for the Kemsley K3 CHP Plant to be constructed on land adjacent to the DS Smith PaperMill at Kemsley, Kent.

As part of the over project scheme approved at planning an attenuation pond is to be constructed with an outfall to the Swale Estuary.

The design works for the outfall have been completed by Arup as our design partners for the project and this is attached as appendix 1.

The design incorporates a 600mm diameter pipe laid from the attenuation pond to an outfall structure constructed within the sea defence wall to the Swale Estuary at the location indicated on the attached drawing appendix 2.

Construction Sequence

The proposed Construction sequence is as follows,

1. Establish working area within the site boundary
2. Remove boundary fence and extend to edge of sea defence
(Footpath closure agreed with local council)
3. Install Earth bund to estuary to form working platform
4. Install sheet piling
5. Excavate within the earth bund
6. Cut down sheet piles to profile
7. Install Reno matting
8. Install 600mm diameter pipe from Head wall to attenuation pond
9. Remove remaining berm and reinstate area
10. Close boundary fence and re open footpath.

Programme

The timings detailed are indicative and will depend on site conditions and progress of the construction works, the planning conditions state that this work can only take place between 1st April and 31st September in any given year.

Estimated overall duration 10 weeks

1. Establish working area within the site boundary – Duration 2 days
2. Remove boundary fence and extend to edge of sea defence – Duration 2 days
(Footpath closure agreed with local council)
3. Install Earth bund to estuary to form working platform – Duration 1 week
4. Install sheet piling – Duration 1 week
5. Excavate within the earth bund – Duration 1 week
6. Cut down sheet piles to profile – Duration 1 week
7. Install Reno matting – Duration 2 weeks
8. Install 600mm diameter pipe from Head wall to attenuation pond – Duration 2 weeks
9. Remove remaining berm and reinstate area – Duration 1 week
10. Close boundary fence and re open footpath. – Duration 1 week

Construction Methodology

Establish working area.

A working area will be established with the main site boundary this area will be separated and secured from the main area by heras panel fencing. This fencing will be extended out on to and over the existing footpath to prevent access to the working area by unauthorised persons.

The footpath closure will be agreed with the local council prior to works commencing.

The area will be used to store the plant and equipment being used for the construction works, welfare facilities will be provided with the main compound facilities. All deliveries will come to Clugston security at the main site access via Barge Way. No other access to the working area will be allowed.

Installation of Earth berm.

An area approximately 15m long by 10m wide is required within the tidal zone of the estuary at the location of the outfall for construction of the outfall. It is proposed that this is formed by placing clay or similar approved material out in to the estuary to form a working platform.

The material specification is to be agreed with the relevant authorities prior to the works commencing. The material will be delivered to the main K3 CHP site and deposited within the secured working area. Excavators and dumpers will then move the material to the correct location and place it in accordance with the agreed requirements to form the working platform. A suitable capping layer will be installed to allow the safe working of the follow on piling equipment.

Hand railing and life saving devices will be placed on the working platform.

Installation of sheet piling.

The sheet piles will be install using a 20t excavator fitted with a vibro hammer.



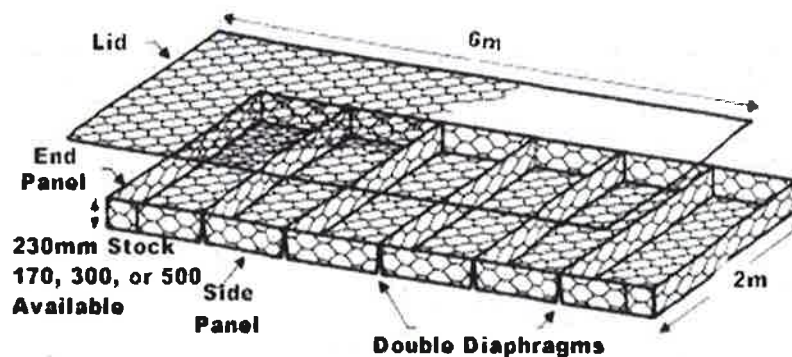
The piles will be approximately 6m long and will be driven from the working platform down to the top of the platform a guide will be used to ensure the piles are installed to the correct profile for the outfall.

Appropriate spill kits will be available to contain any spillages from a failure of the hydraulic systems on the piling equipment.

Outfall structure construction.

On completion of the sheet piles the area of the outfall will be excavated, this will leave a bund around the perimeter of the construction area to protect from water ingress and flooding.

With the area excavated the sheet piles will be trimmed to the required profile and the RENO mattress installed



RENO Mattress



Typical RENO Mattress installation

Pipe installation

The 600mm diameter outfall pipe will be laid by open cut techniques from the outfall structure to the next downstream manhole.

A 20t excavator using trench boxes as temporary ground support will be utilised to install the outfall pipe.

The pipe will be blanked off at the outfall to prevent flooding of the main construction site should the earth bund fail or be overtopped in the event of a storm.

Pumps will be available to pump out water should this occur.

The non return valve will be installed on the head wall once the pipework has been completed.

Reinstatement.

On completion of the pipework installation and the outfall construction the earth bund will be removed using the 20t excavator working from the bund back towards the land.

The material will be removed to the main site area for reuse within the site works or disposal from site.

The embankment and footpath will be reinstated to match the existing embankment and the fence reinstated to the site boundary.



Existing sea defence

Appendix 1.

Appendix 2.

Key:  Proposal Site



300 ALABAMA
SUITE 100
BIRMINGHAM, AL 35203
TEL: 205.253.6000
FAX: 205.253.6001

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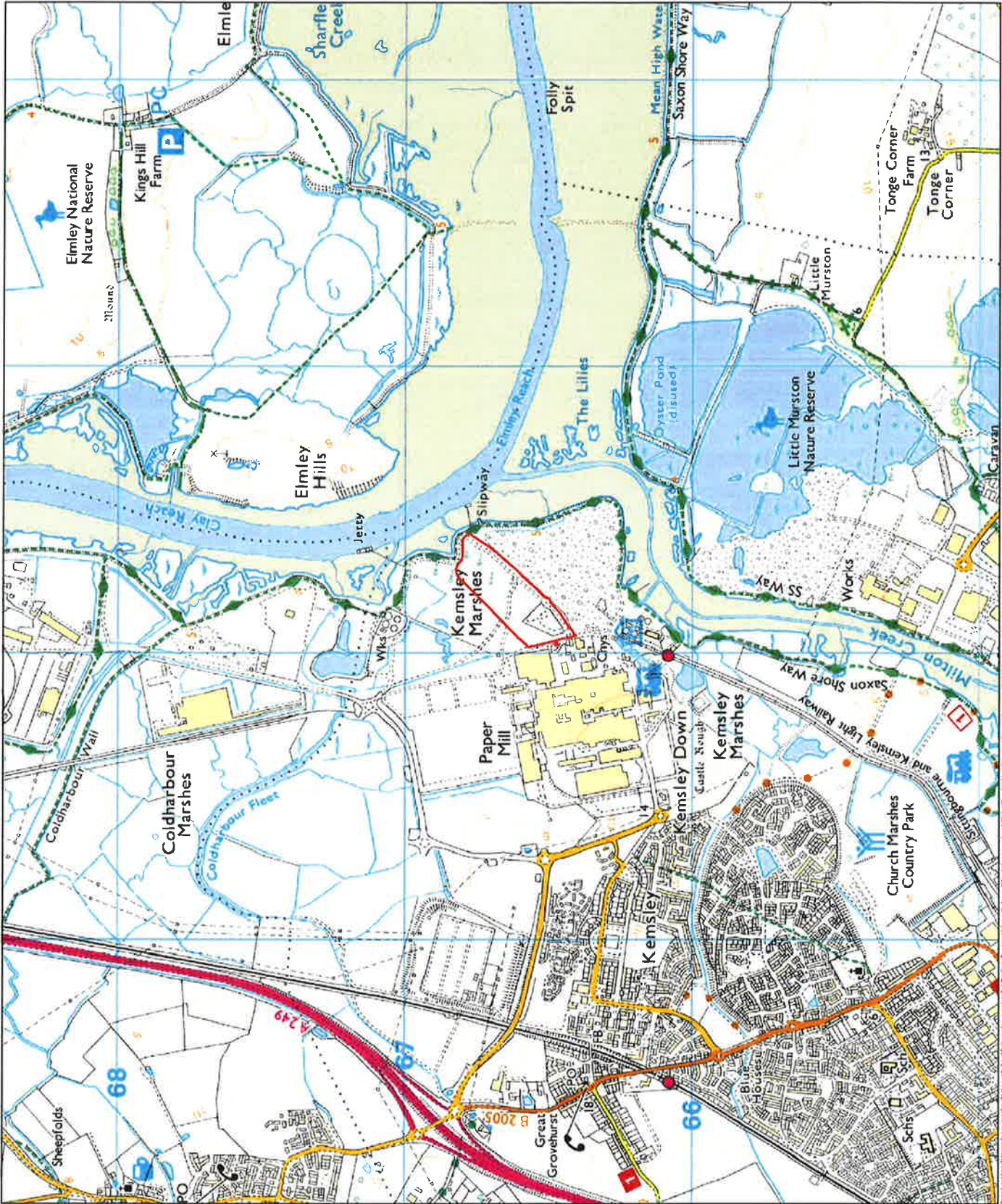
STREGIS e-on

PROJECT: Kemsley Sustainable Energy Plant

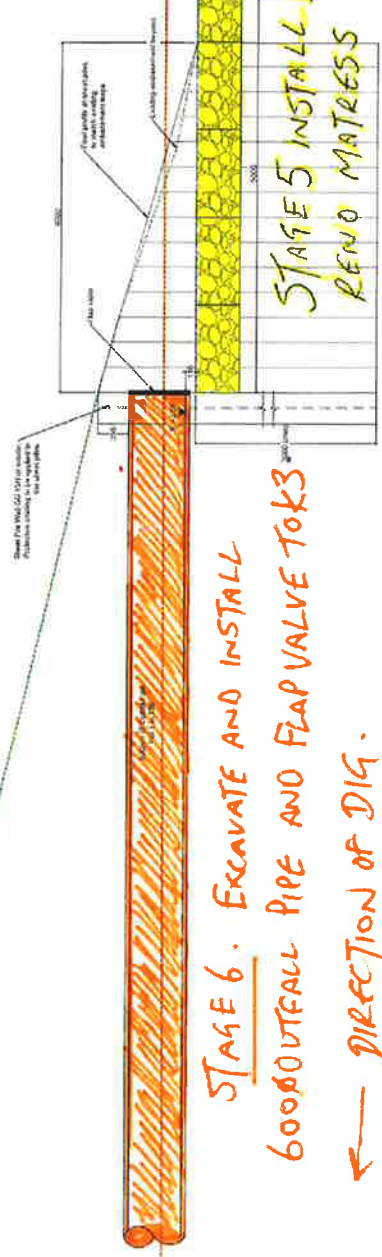
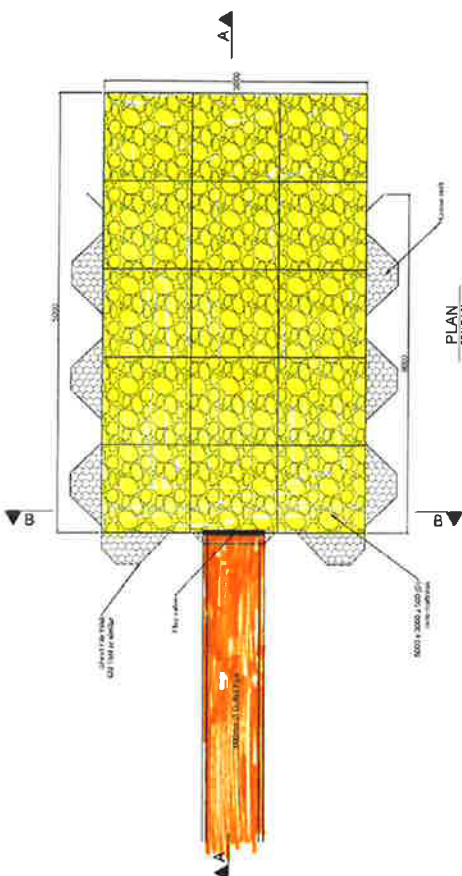
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SCALE: 1:10000 @A3
DRAWN BY: LB
DATE: October 2009
CHECKED: JS
CADD FILE

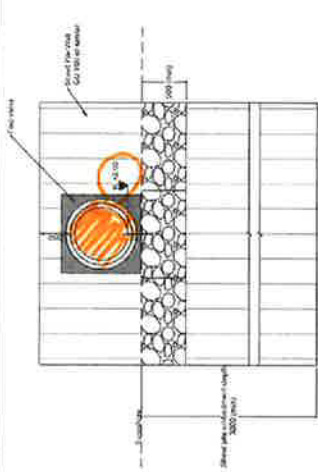
PROJECT NUMBER: DLE1726
DRAWING NUMBER: Figure 1.1
KEY



Appendix 3.



STAGE 5 INSTALL
RENO MATRESS



Notes:

- Refer to the K3 CHP Facility for all other details.
- Refer to the K3 CHP Facility for all other details.
- Refer to the K3 CHP Facility for all other details.
- Refer to the K3 CHP Facility for all other details.

Item	Quantity	Unit	Notes
1. 6000 Outfall Pipe	1.0	m	
2. Flap Valve	1.0	ea	
3. Reno Mattress	1.0	m	
4. 6000 Outfall Pipe	1.0	m	

K3 CHP Facility
Emergency and Maintenance Unit

13 CHP

Wheelabrator
TECHNOLOGIES

ENIM
CONSTRUCTION

ARUP
CONSULTANTS

Page 3 of 4
Outlet Detail

K3 SIB
Outlet Detail

Page 3 of 4
Outlet Detail

AAK 04
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REMOVE BURN AND CEINSTATE
EARTHWORKS TO EXISTING / SHEET PROFILE



Notes

1. *My country is a wonderful place!* (homework sheet)
2. *Let's work on this in class after the Christmas holidays!* (p. 148)
3. *Copy this text and insert in boxes of the English history with a copy printed by Google in 1975, last page, 2015.*
4. *Connect the top of each line to the top of the column it is linked to.*

Year	Population	Area
1990	1,000,000	100,000
2000	1,200,000	120,000
2010	1,400,000	140,000

[illegible]