



**Document 3.1- ES Volume 2
Appendix 2.1 Outline Construction
Environmental Management Plan**

**The Kemsley Mill K4 Combined Heat and
Power Generating Station Development
Consent Order**

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

April 2018 - Submission Version

PINS Ref: EN010090



**Document Reference: 7076-0175-951-02-0001-01 REV
P1 Outline CEMP**

Document Type: Construction Management Plan

**KEMSLEY MILL CHP (K4)
OUTLINE CONSTRUCTION
ENVIRONMENTAL MANAGEMENT PLAN
(OCEMP)**

Business Function: SHE Department

Document Owner: Environmental Manager

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TEMPLATE NO: INF-T-010

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¹ The final layout and content of all supporting forms will be updated for the final approve CEMP as necessary.



1.0 INTRODUCTION

At the request of DS Smith Paper Ltd (DSS), E.ON intend to construct, own and operate a new Combined Heat and Power (CHP) plant which will be known as Kemsley No.4 (K4). It will supply power and steam to the DSS Kemsley Paper Mill near Sittingbourne, Kent, in the south-east of England. K4 will be built on land adjacent to an existing CHP plant (K1), which will be decommissioned once the new plant is operational. The new K4 plant will be operational by Q3 2021, with site enabling works and main construction scheduled to commence late 2019 and early 2020 respectively. Costain has been appointed as Principal Contractor (PC) and is responsible for construction of the new K4 plant on behalf of E.ON.

DHA and RPS have prepared an Environmental Statement (ES) on behalf of DSS in support of a Planning Inspectorate (PINS) requested Development Consent Order (DCO) application for the site. This OCEMP draws on relevant Environmental information contained within the ES supporting studies, where environmental risks requiring construction phase mitigation have been identified as well as other general management techniques for environmental protection during the construction phase of a Project.

Costain has been engaged by E.ON to deliver “Engineering, Procurement, Construction & Management” (EPCM) Contractor services, which includes all tasks commonly linked to the role of “General Planner” for the design and construction of the K4 CHP plant. Costain as the EPCM, will also fulfil the roles of both Principal Designer and the Principal Contractor with respect to the CDM 2015 Regulations.

1.1 Purpose

This outline construction environmental management plan (OCEMP) has been prepared in support of the new K4 construction Project and includes reference to all known relevant information currently available at this early stage in the development process. It will be updated prior to commencement of the construction phase. This OCEMP fulfils the requirements of Costain’s environmental policy statement and has been prepared to include all environmental considerations presented by DSS during the DCO planning phase. It should be read in association with the ES prepared by DHA and RPS.

The Costain Project management team will be responsible for reviewing all proposed work processes and monitoring site activities. The environmental implications of the Project’s construction activities will be considered during ENVID design reviews², environmental control plan meetings², method statement reviews² and on-site as part of environmental inspections². An appointed specialist from Costain’s SHE Department will provide all environmental management guidance to the Project. Where necessary, further advice may be sought from Costain’s shared services or specialist external consultants. The Costain environmental manager that has been appointed for this Project is detailed in Table 1 below.

Table 1 – Environmental manager details

Name	Position	Mobile Number	Email Address
G Williams	Enviro Manager	07487376610	gordon.williams@costain.com

Costain aims to work in a manner that maximises the opportunities to enhance the environment whilst reducing the negative environmental impacts of a construction Project in accordance with the Costain Group Environmental Policy.

² See proforma forms in Appendix A

The OCEMP establishes the arrangements to manage all environmental risks associated with K4 and details how monitoring will be used to ensure that agreed environmental procedures are adhered to and supported operationally by relevant documentation. The overriding environmental objectives for construction are:

- Mitigate environmental hazards and risks through the planning and risk assessment processes;
- Avoid, or if not practicable, reduce and control, environmental hazards and risks;
- Support the application of Best Available Techniques (BAT) throughout construction;
- Communicate all hazards, risks and controls;
- Comply with all relevant legal, regulatory & Costain / E.ON / DSS requirements; and
- Always monitor and establish opportunities to improve environmental performance.

All Sub-Contractors will be required to provide evidence, specifically Risk Assessments and Method Statements, to show how they will control environmental risks that may arise from undertaking their works.

1.2 Version history

Minor changes to the CEMP do not require a re-brief to the Project team. These are recorded in Table 2 below by the same version number. Major changes, require a full briefing to all Project/construction teams and a new version number to be issued. Major changes are recorded in the contents table on pg. 2.

Table 2 – CEMP³ version record

Issue	Date	Section No	Subject	Authorised
Rev P1	Mar 18	All	Original Document Creation to support DCO application Process	ST

1.3 Site description

The site lies in the south-east corner of the existing Kemsley Paper Mill site, approximately 600m west of the Swale Estuary and north of Milton Creek in the borough of Swale, Kent. The site is accessed from the A249 via Swale Way. An internal access road provides access to the K4 construction site. K4's site surface is comprised almost entirely of existing concrete hardstanding. Sittingbourne town centre lies approximately 2.5km south of the site.

Table 3 – Site address

K4	Kemsley Mill	Kemsley	Sittingbourne	Kent	ME10 2TD
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1.4 Proposed K4 construction works

K4 will supply steam and power to DSS' neighbouring Paper Mill and will have a power output of between 68–73 MW. The proposed layout of K4 is depicted in the DCO ES documentation and will comprise a combined cycle plant fuelled by a gas turbine (GT) of 52–57MW, a heat recovery steam generator (HRSG) of 105MWth steam and a steam turbine.

A full list of major plant items is provided below:

³ The detailed CEMP will be agreed with Swale DC prior to the commencement of site enabling works.

- GT Generator
- Start transformer
- Switchgear
- Block transformer
- HRSG, stack and chemical dosing equipment
- Dump steam condenser
- Turbine hall
- Steam turbine & generator
- Condensate pumps & tank
- Plant control room
- Fire control unit
- Battery enclosure
- Transformer
- Package boiler & stack
- Effluent sump
- Boiler water feed pumps
- Fin fan cooler
- Pipe bridge

In addition, the following facilities and equipment will be temporarily installed on-site during the construction phase:

- Temporary offices and office welfare
- Canteen, and contractor welfare
- Auxiliary facilities
- Parking areas for cars and construction vehicles and plant
- Laydown areas for construction materials and equipment
- Fabrication, assembly and testing Workshops

1.5 Programme details

Table 4 below details the anticipated Project programme dates and key milestones.

Table 4 – Estimated project programme

Phase Description	Commencement Date	Completion Date	Duration of Works
Design	September 2017	April 2018	8 Months
DCO Application	April 2018	December 2019	20 Months
Enabling Works	December 2019	February 2020	3 Months
Main Construction	February 2020	July 2021	18 Months
Commissioning	July 2021	September 2021	3 Months
Operation	September 2021	n/a	n/a

1.6 Working hours

Working hours for the construction phase of the Project have been established in the supporting DCO ES application documentation. Working hours will be finalised nearer the time of construction commencement through consultation with the environmental team responsible for Section 61 Consenting within the Swale Borough Council Local Authority. For the purposes of this OCEMP the following working hours for construction are proposed:

Table 5 – Construction hours

Activity Carried Out On	Hours
Monday to Friday	07:00 – 19:00
Saturday	07:00 – 16:00
Sunday	07:00 – 16:00

2.0 CONSTRUCTION SITE SET-UP

2.1 Site accommodation

Cost and energy/resource efficiency comparisons between Eco-cabins and standard cabins will be calculated to understand the short to long term carbon/financial savings on the Project. Eco Cabins will be utilised if Costain is required to provide its own site accommodation. Eco-cabins benefit from a range of energy efficient technologies such as:

- Passive Infrared Receiver (PIR) lighting
- PIR controlled thermostat electric convactor heaters
- Double glazed windows
- Thermally efficient with passive ventilation
- Non-concussive aerated taps

Other sustainable options will be incorporated following investigation into feasibility, such as:

- Grey water system
- Rainwater catchment
- Underfloor heating
- Solar panels
- Solar water Biomass boilers

Eco units and energy saving cabins meet the welfare, health and safety standards of the business and provide environmental and cost benefits. Switching to this sustainable option will be set as a Project sustainability objective. Also, if solar energy is incorporated into the operating function of the cabins, there will be significantly less potential for unwanted environmental impacts often associated with more conventional fuel-generator powered premises.

Table 6 - Requirements for site connections

Service	Applicable	Date of Connection
Water (Mains)	TBC	TBC
Electricity (Mains)	TBC	TBC
Gas (Mains)	TBC	TBC
Foul (Sewer)	TBC	TBC
Telecoms (BT or other)	TBC	TBC

2.2 Plant and equipment

When procuring plant and machinery, Costain will promote 'Eco' options with lower environmental impact and, where commercially viable, procure these to minimize the carbon and water footprint of the Project.

Hybrid generators operate alongside a standard diesel generator and work by detecting low loads at which point they automatically switch the generator off and power the site by battery instead. Once the battery is depleted the generator will start up to power the site whilst recharging the battery.

There are several key benefits to making use of hybrid generation systems on site; reduced fuel consumption and CO₂ emissions, zero noise during operation and remote monitoring available on many models allowing sites to accurately quantify benefits. In the absence of 110v sockets on site and the requirement to utilise a generator, a site assessment will be conducted to identify whether hybrid generators will be the best option.

Operated vehicles shall generally be diesel powered, which is more energy efficient than equivalent petrol driven vehicles, resulting in less fuel consumed by the Project generally. Vehicles operated by Costain shall also be serviced in accordance with the manufacturer's details to maintain efficiency and minimise pollution. Energy efficient plant will be chosen where practicable.

2.3 Lighting

With falling costs of LED lighting systems, together with longer lifetimes and reduced maintenance costs relative to standard metal halide bulbs, this option will be considered for the Project. Wherever possible, VT Hybrid LED energy efficient lighting towers will be utilised on the Project. These lighting towers are the best in resource efficiency with a run time of +700hours. Additional features which improve the environmental performance of these products are timers and light sensors which will all be used as applicable.

2.4 Access and parking

Access to the K4 construction area will be via a designated construction access and not the main Paper Mill access. Site parking for construction personnel will be marked out in a designated parking bay area during the site establishment phase. Reverse parking will be implemented.

2.5 Green travel

Fuel consumption shall be monitored during Costain's on-site construction activities regarding travel to and from site and site offices, with a view to seeking opportunities for carbon reduction wherever practical. This will also apply to the need to travel to any other satellite locations, e.g. E.ON's offices.

2.5.1 Driving

The use of alternatives to driving cars will be promoted during the construction phase of K4 wherever possible. Where unavoidable, the routes to site by road will be described within a construction Traffic Management Plan (TMP). The TMP information is available for viewing in the ES and will be updated prior to the commencement of site enabling works. Car sharing, particularly from contractors staying in nearby hotels together, will be promoted as it offers a good means of reducing the impact of travel on the environment through lowering travellers carbon footprints.

2.5.2 Train

- London St Pancras to Sittingbourne, direct train approx. 1 hour.
- Sittingbourne to Kemsley 6 minutes.
- From the train station take a taxi to site address ME10 2TD (approx. 10 minutes).
- Look out for the Costain & E.ON signs which will direct you from DSS Paper Mill to K4 site. Access will be via a designated construction access rather than via the main Paper Mill access.

2.5.3 Bus

From Sittingbourne Town Centre (Ufton Lane Stop G) the No 347 towards Kemsley service goes to a designated bus stop directly adjacent to the K4 site. Buses run every 30 minutes and the journey time takes approximately 20 minutes.

2.6 Site plan

A site plan will be produced and will form part of a site induction. A print of a live construction drawing will be the starting point for annotation. The site plan will be displayed in the Costain induction and meeting rooms and on all welfare facility notice boards. It will be reviewed during the life of the Project and amended accordingly. From an environmental perspective, the site plan shall include, but will not be restricted to:

- General site layout
- Storage areas, including any lay-down areas
- Containers on-site and their contents
- Waste storage arrangements
- Any segregation of working areas under Costain or subcontractor's responsibility
- Any restricted or special working areas e.g. proximity to neighbours
- Site drainage system including drain covers, surface water and foul water systems, discharge points, soak-away, oil separators/interceptors, and any shut-off valves. It should also indicate the direction of flow within the drainage system. (Note it is good practice to mark surface water drain covers blue and foul water covers red)
- Location of the mains water supply stopcock, any sprinkler control valves, and fire hydrants Position of controlled waters e.g. streams, ponds, culverts, springs, boreholes, wells, aquifers
- Any potentially sensitive areas of porous or unmade ground
- Environmentally ecological sensitive areas
- Location of pollution prevention materials e.g. spill kits, sand
- Concrete wash-out points

3.0 PROJECT SET-UP

Costain operate a readiness review procedure whereby construction is not permitted to commence until all environmental matters have been considered and put in place. These are:

- environmental risks and mitigation measures
- permits and consents
- definition of environmental objectives and targets
- definition of environmental roles and responsibilities
- environmental communications, competence, training and awareness
- environmental monitoring and measurement
- inspections, audit and corrective action
- environmental documents and records

Prior to construction, a Project environmental planning meeting will be initiated between Costain, E.ON and DSS to identify all significant Project environmental impacts and aspects that have been established during this current planning stage of the Project. The Project will ensure all environmental risks are controlled.

3.1 Environmental risks and mitigation

At this stage, the ES documentation supplied by DHA and RPS in support of the DCO application has been reviewed and utilised in this OCEMP for the purposes of defining construction environmental risks and mitigation requirements. Project specific environmental risks and control measures known at this stage are presented in Section 4. Project environmental risks will also be detailed in all pre-construction information, together with further risk assessments as deemed necessary, including those for all activities carried out by other sub-contractors under Costain's control. The identification and effective management of activities with risks to the environment will be planned, organised, controlled, monitored and reviewed regularly at programmed construction SHE meetings.

All persons attending site, whether visitors, employees or self-employed, are informed of the risks together with the preventive and protective measures established, so that they understand what they need to do.

Table 7 – Environmental risk register

Report Details – Output Required
Environmental risks will be detailed in full within a construction Environmental Risk Register (ERR). The ERR will be produced and implemented in full prior to the commencement of site enabling works. This document will be reviewed and approved for use periodically as the construction phase of the Project evolves.

3.2 Construction enabling permits and consents

The construction phase of the Project will meet its legal requirements through compliance with all DCO requirements, local authority, enforcement agency conditions and all relevant legislation. Updates will be made available to the Project team via the Environmental Manager. The obtaining of permits and consents will be programmed with sufficient timescales to allow for dialogue with the relevant consent granting authority. For example, if necessary, S61 construction nuisance consents require at least 28 days for approval by the local authority. Flood Defence Consents can take up to 56 days for approval by the EA. Table 8 provides an indication of permits and consents that may be required for this Project. This table will be updated as the Project progresses through detailed design and more knowledge is obtained on what specific permits and consents will be required. At this stage the following list is indicative based on the current project scope.

Table 8 – Permits and consents

Type	Issuing Body	Date of Expiry	Additional Comments
Section 61	SBC	As applicable	Agreement for working hrs can be established in some cases, allow 4 weeks to process
Dewatering	EA	As applicable	Required if dewatering activities extend beyond 3-months, allow 12 weeks to process
Flood Defence	EA	As applicable	If required for permanent works, will cover construction phase, allow 8 weeks to process
Materials Management Plan	Cl:aire	As applicable	Requires sign-off by a Qualified Person (QP), allow 12 weeks to process

3.3 Environmental objectives and targets during construction

Table 9 summarises environmental objectives and targets (O&T’s) applicable to the construction phase of the Project. These are of a preliminary nature at this stage and final O&T’s will be agreed and set by E.ON, Project Team, and any other stakeholders as appropriate prior to K4 enabling works. Review of performance to these objectives will be conducted as part of internal audits and progress meetings.

The Project will also:

- Comply with all relevant environmental legislation avoiding prosecutions for the contravention of environmental law and regulations
- Comply with all of Costain’s SHE standards as EPCM under CDM 2015
- Raise environmental awareness throughout the site management team and sub-contractors by means of regular environmental tool box talks and awareness sessions
- Implement suitable and sufficient controls to achieve zero pollution incidents (emergency spills, noise / nuisance, water contamination, waste management issues) whilst maintaining an operational work site
- Implement the waste hierarchy: prevent waste where possible; reuse materials until they can’t be used again; recycle waste where reasonably practicable; recover waste (e.g. energy recovery); and only dispose of waste if no other options within the hierarchy are possible
- Identify and recognise all designated sites (Sites of Special Scientific Interest, Areas of Outstanding Natural Beauty etc.), listed buildings and protected flora, fauna and wildlife that may potentially be affected by site activities. The site will instigate appropriate mitigation measures to ensure adequate protection and that minimum disturbance is caused

Table 9 – Environmental O&T’s for construction

No	Set By	Requirements	Monitoring Arrangements
1	Costain	CEEQUAL minimum score of ‘Excellent’	- CEEQUAL internal reviews - External assessment program
2	Costain	Considerate Constructors (CCS) Score of at least 45/50 for environmental	- CSS external assessor audits - Appointment of CSS Champion - Appoint Community Champion
3	Costain	Construction energy reduction of 10% Every 6 months	- Appoint Energy & Utility Champion - Resource efficiency matrix
4	Costain	Construction water reduction of 10% Every 6 months	- Environmental metrics - Smart meters installed
5	Costain	Achieve zero waste to landfill for duration of construction phase	- Site waste management plan - Environmental metrics

- Environmental Roles and Responsibilities
- Waste Coordinator
- Fuel / Storage Coordinator
- Community Champion
- Noise, Vibration and Dust Monitoring Technician
- Energy and Utility and CSS Champion
- Environmental Trainer and Awareness Promoter
- All staff who have a responsibility for their own environmental impact

All nominated personnel must sign an appointment letter and be briefed on the contents of this OCEMP and all other supporting environmental Project plans and documentation relevant to their role. Any changes to Project information will be communicated immediately and all evidence of briefings shall be retained on the Project.

3.3.1 Environmental Manager Role in Detail

The Environmental Manager shall be responsible for:

- Ensuring compliance with the CEMP, procedures and legislation.
- Reviewing the Works with a view to reducing waste generation, improving opportunities to recycle material, identifying opportunities to use recycled materials in the design, reducing the carbon footprint, and improving the sustainability of the K4 project. Consideration should be given to operation, maintenance and construction arrangements.
- Managing specialist environmental Subcontractors and service providers.
- Ensuring that environmental issues are covered during induction training sessions for all employees, Subcontractors and DSS and E.ON staff associated with the project.
- Reporting to the E.ON and DSS Project Managers all environmental incidents in accordance with Costain's reporting procedures.
- Reporting to the E.ON and DSS Project Managers all information required to monitor Key Performance Indicators and progress towards the projects sustainability objectives.
- Ensuring that liaison with the E.ON's and DSS' nominated Environmental Coordinators and Environmental Advisors is maintained.
- Ensuring that liaison with the environmental authorities is maintained as appropriate, having regard to the E.ON's and DSS' expectations in this regard.

3.4 Environmental communications, competence, training and awareness

The Costain Project Manager will ensure that all individuals employed on the contract have the appropriate training and experience required for the implementation of this OCEMP. Those members of staff identified as having an environmental role in Section 3.4 above must be suitably experienced and competent to undertake the role. A Costain programme of Environmental Awareness training will be delivered to all applicable staff members, and where appropriate, members of the wider construction team, sub-contractors and key stakeholders from E.ON and DSS will be allocated attendance.

Site-specific environmental matters will be included in the main SHE induction and will be given to all personnel entering site. They will be made aware of the site plan, site rules, the extent of the site, ground conditions and access/egress authorisation. The induction will highlight specific environmental risks and hazards on-site, together with any preventive and protective measures, including permits to work, as well as emphasising everyone's duties about environmental management. Relevant parts of the CEMP will be made known and a record will be kept of all inductions carried out.

Toolbox talks (TBT's) and environmental alerts will be given on key topics arising during the construction phase. Weekly construction SHE meetings will be the main forum to review the performance against objectives and highlight areas of concern, as well as plan future environmental requirements. Instructions regarding environmental issues that require immediate action will be conveyed verbally, followed up in writing when applicable. The following table provides an indication of the topics that will be covered in TBT's.

Table 10 – Environmental TBT's

No	Topic	Target Audience	Frequency
1	Noise	Construction personnel	Monthly
2	Fuel & Spill Control	Construction personnel	Monthly
3	Ecology	All personnel	Monthly
4	Air Quality	Construction personnel	Monthly
5	Water	Construction personnel	Monthly
6	Contamination	Foundation contractors	Prior to enabling
7	Cultural Heritage	Enabling contracts	Prior to enabling
8	Waste and Recycling	Sub-contractors	Monthly

Table 11 – Communication methods

Level	Method	Target Audience	Frequency
Project	- Monthly SHE meetings - Daily whiteboard meetings	Management / workforce / Environmental Manager	Monthly
Site team	- Task briefings - Start of shift briefings	Construction personnel inc all sub-contractors	Weekly / Daily
Individual	- Suggestion cards - Near miss reporting	All personnel	Open door
Stakeholders	- Stakeholder meetings - Project reviews	Client / LA / Regulators / residents	As programmed

Details of all planned communication methods are included in Table 11. These are subject to change and will be further defined prior to construction. All communications with statutory bodies including applications or agreements must be done in agreement with E.ON and DSS. Records of discussions and meeting minutes will be held on file within Costain's data management system. Where a statutory body makes an unplanned approach to K4, E.ON and DSS will be informed as soon as possible.

Table 12 – Regulatory agencies and interested parties

Environmental Interest	Regulator	Contact
Water Pollution	EA	TBC
Protection of Flora & Fauna	EA / Council / Natural England	TBC
Waste Management	EA	TBC
Nuisance/Air quality / Noise	Local Council / EA	TBC
Contaminated Land	Local Council / EA	TBC
Fire / explosion	Fire Brigade / EA	TBC
Site access arrangements	Highways Authority	TBC

3.5 Environmental monitoring and measurement

Reporting of KPIs will be completed on a 4-weekly basis detailing the information below:

- Number and type of environmental incidents (if any)
- Number and type of environmental near misses (if any)

- Number and type of complaints (if any)
- Waste generated – Designed-out, Reused, Recycled or landfilled
- Energy used
- Water used

3.6 Inspections, audits and corrective action

Monitoring of site operations with respect to environmental protection will be carried out on a day-to-day basis by site management. Weekly site environmental inspections will be carried out and recorded by site construction staff on a rota basis. Health & safety, environmental and quality managers will also carry out regular inspections and audits. Additional inspections will also be invited from directors and senior managers from Costain, E.ON and DSS. Any environmental investigations required will be carried out by Costain’s Environmental Manager.

An environmental audit will be conducted within the first 6 weeks of K4 construction start by the Costain and E.ON Environmental Managers and on a regular basis thereafter. The audit encompasses the whole suite of environmental management requirements. Issues identified will be categorised as either a Major (breach of legislation; mitigation), Minor Non-Conformance (breach of Costain, E.ON or DSS environmental policy or procedure) or Action (observation).

- Where a major non-conformance is identified, close-out for compliance will be immediately
- Where a minor non-compliance is identified, close-out for compliance will be 14 days
Where an action is identified, the close-out period will be dependent on urgency. These actions will be reviewed regularly by the site management team

Close-out of audit will require documented evidence identifying all actions and timescales involved. The construction manager will hold ultimate responsibility for closing-out actions but may delegate to relevant members of the wider construction team as appropriate. As necessary the OCEMP will be updated based on the findings/actions of the audit.

Table 13 summarises inspection and audit arrangements that will be employed during the construction phase:

Table 13 – Environmental inspections and audits

Type	When
General site inspection	Daily
SHE inspection	Weekly
Environmental Manager site inspection	Monthly
Sub-contractor environmental review	Monthly / End of works package
Environmental audit	6-monthly
ISO 14001 external audit	As planned
Statutory inspections	As planned
Spot visits by EHO, EA, Natural England	Generally unplanned and unidentified

3.7 Environmental documents and records

All environmental documents and records will be maintained and stored within Costain’s data management system. Hardcopies of key environmental documentation will be maintained on-site in their most current version. These will include:

- DCO Environmental Statement
- Environmental statement

- Environmental risk register
- Construction environmental management plan
- Environmental emergency response plan
- Site waste management plan, waste transfer notes and consignment notes
- Water management plan
- All live environmental permits and consents
- Contamination and remediation plan

At the end of the Project, final closing versions of all construction Project environmental documents will be provided for inclusion in the SHE files.

A Traffic Management Plan will also be produced as a standalone document prior to construction commencing. This will reference all relevant information presented in Section 4 of the ES 'Traffic and Transport' and will include details of all mitigation measures required to manage construction related traffic.

4.0 SPECIFIED ENVIRONMENTAL IMPACTS

This section details the specific impact areas and mitigation the Project will employ to manage the environmental risks and opportunities available.

4.1 Air quality

4.1.1 Key issues

Construction-related traffic is expected to access the Site via the A249 and the M2. Neither route is located within a designated Air Quality Management Areas (AQMA). The indicative criterion of 100 vehicles outside an AQMA will not be exceeded as there will be an estimated 60 vehicles per day during the construction phase. Traffic flows are expected to be significantly lower on other routes other than the A249 and the M2 as the traffic redistributes. Therefore, Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) traffic-flow thresholds are not expected to be exceeded for any individual road during the construction phase and the impacts of construction-vehicle exhaust emissions will be negligible.

The main effect of any dust emissions, if not mitigated, could be annoyance due to soiling of surfaces, particularly windows, cars and laundry. However, it is normally possible, by implementation of proper control, to ensure that dust deposition does not give rise to significant adverse effects, although short-term events may occur (for example, due to technical failure or exceptional weather conditions).

Provided dust mitigation measures are implemented, the residual construction dust effects will not be significant. IAQM dust guidance states that "For almost all construction activity, the aim should be to prevent significant effects on receptors using effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'." The IAQM dust guidance recommends that significance is only assigned to the effect after the activities are considered with mitigation in place. The proposed mitigation measures to achieve this status are considered below. These will be updated nearer the time of the construction phase of K4 to ensure they remain appropriate.

4.1.2 Mitigation measures

The following control measures will be implemented:

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible
- Avoid site runoff of water or mud
- Check of machinery to make sure it's in good working order and that exhaust levels are as expected
- Lorries, as well as skips, should be properly sheeted
- Ensure that chemicals / solvents that cause nuisance fumes, or smells are appropriately stored and controlled with respect to COSHH specifications
- Correct operation of vehicles and machinery & incorporation of green travel (Sec 3.5)
- Ensure all vehicles switch off engines when stationary – no idling vehicles
- Use enclosed chutes and conveyors and covered skips
- Ensure appropriate waste management is implemented as detailed in Section 4.8
- Avoid bonfires and burning of waste materials
- Display the name and contact details of person(s) accountable for air quality and dust issues on the K4 site boundary
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken

- Make a complaint log available to interested parties
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation
- Carry out regular site inspections to monitor compliance with the CEMP

4.2 Archaeology and cultural heritage

4.2.1 Key issues

The wider landscape generally has high potential to contain remains of all dates from the prehistoric onwards. The K4 Site itself, which contains buildings and hardstanding, is located at a junction of higher ground associated with Kemsley Ridge, which lies on the London Clay.

There is an alluvial floodplain to the north and east, which in general has the potential to contain deposits of paleo-environmental significance. Recent archaeological work on the Sittingbourne Northern Relief Road has indicated that the higher ground of the Kemsley Ridge has the potential to contain remains from prehistoric through to medieval periods, with remains potentially present in the surrounding lower lying marshlands.

The nature of the 20th century land-use at the site and associated ground disturbance suggests that the potential for the survival of previously unidentified subsurface archaeological remains of national importance, or of sufficient importance to warrant preservation in situ, is unlikely. It is likely that any archaeological deposits have been damaged or removed and that the potential for the survival of significant, coherent archaeological remains is low.

4.2.2 Mitigation measures

The location of K4 being on previously developed land, nature and design (i.e. an industrial development of appropriate scale and massing) of K4 is intended to help mitigate any effects on the setting of designated assets through construction. The remaining boundary alignments around the K4 would be preserved in-situ and the landscape pattern in terms of the industrial character of the area would remain unchanged through K4's construction.

Due to the potential for buried remains to be present, SBC has requested that a written Scheme of Investigation (WSI) including a programme of trial trenching is prepared prior to development.

4.3 Ecology

4.3.1 Key issues

The Site and its surrounds comprise almost exclusively hard standing in the form of roads, lorry parks, and industrial buildings comprising the existing K1 and K2 CHP plants and a recently-constructed water treatment works. Several other buildings are present within the boundary. The existing construction site area of K4 does not support any habitat used by protected or notable species and comprises only hardstanding and industrial buildings. However, construction activities may still potentially cause:

- Temporary disturbance to wildlife, e.g. from noise, vibration or light pollution, human activity and vehicular movements, and overshadowing of bird habitats; and/or
- Accidental release of pollution during construction of the K4 site.

A phase 1 protected species habitat and invasive non-native plant species survey and walkover of the site and surrounding area was conducted in October 2017 by RPS. Habitats within the site were classified, mapped and are described below.

The Swale forms a Site of Special Scientific Interest (SSSI) and a Special Protection Area (SPA), a Ramsar site and a Marine Conservation Zone (MCZ). The SWALE SSSI lies approximately 0.3km to the south east of the site. No access will be available to construction workers to the Swale, but all involved with the project will be made aware of its SSSI status.

Amphibians

There are 66 records of protected or notable amphibian species occurring within 2 km of the assessment boundary. Largely, these are associated with Milton Creek LWS and are not associated with K4 itself.

Birds

There are 97 records of protected or notable bird species occurring within 2 km of the K4 boundary over the last ten years. Most these are associated with designated sites such as or The Swale Ramsar, SPA and SSSI, or Milton Creek LWS.

Noise created by the operation of machines and vehicles during the construction phase has the potential to disturb birds. Very loud and short, sharp 'percussive' noises such as those generated by percussive piling can mimic gunshot and have the greatest potential to cause disturbance. Loud but discontinuous noises, as can be produced by machinery during construction processes, can also cause disturbance when noise exceeds certain levels. As part of the DCO application, modelling of the noise generated by the loudest events (percussive piling of the boiler house) has been undertaken by RPS. This modelling has indicated the highest noise that would be received by birds using the closest area of habitat during piling would be circa 70-75 dBLA. This is below the 80 dBLA_{max} threshold for disturbance.

K4 is over 400m from the southern-most edge of a reedbed where *Marsh Harrier* have been recorded breeding, with significant existing industry in between. Therefore, there is no potential for disturbance of this species from people and plant movement during construction from activities on site.

Surveys of the wider Mill site have found good numbers of *Cetti's Warbler* breeding in appropriate habitat. However, the site itself does not include any habitat that could be used by breeding birds of conservation interest.

Flora

The only small areas of vegetation in relation to the Site comprise a small area of short-mown improved grassland, dominated by Perennial Rye-grass *Lolium perenne* and an area of dense scrub, dominated by *Hawthorn Crataegus monogyna*, adjacent to the Effluent Treatment Plant offices. These are not located on the K4 site but near to it.

There are 20 records of protected and/or notable flora species occurring within 2 km of the assessment boundary. Like other protected species, these are associated with designated sites, such as The Swale SPA, Ramsar and SSSI, as well as Milton Creek LWS.

Invertebrates

There are 28 records of protected and/or notable invertebrate species occurring within 2 km of K4 over the last ten years. Again, these records are largely associated with The Swale SPA, Ramsar and SSSI.

Mammals

All buildings near to and associated with the K4 site are considered to not possess bat roost potential.

There are 1,565 records of water vole *Arvicola amphibius* recorded within 2 km of the site over the last ten years. These are all associated with the series of ditches within the wider area that form part of the grazing marsh within The Swale SPA, Ramsar and SSSI. Other records of protected and/or notable mammals include European hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus* and several species of shrew. These are all a significant distance away from the K4 site boundaries.

Reptiles

There are 12 records of protected and/or notable reptile species occurring within 2 km of the site over the last ten years. These are associated with Milton Creek LWS and The Swale SPA, Ramsar and SSSI and are a significant distance away from the K4 site boundaries.

4.3.2 Mitigation measures

Prior to any work commencing on site, all operatives will receive a site induction. The site induction will provide a global overview and cover all ecological constraints that are relevant on-site.

There were no habitats (or habitat which could support protected species) on site pre-development that were of any ecological value, and therefore, there are no mitigation aims/objectives/measures necessary regarding habitats. Standard, best practice dust-suppression methods will be used throughout the construction phase of the development, thereby avoiding any impacts because of dust settlement on habitats and species. However, any unexpected finds in terms of ecological importance are uncovered during the construction programme which are not covered by this plan, works will be halted immediately and advice sought from an ECoW.

4.4 Water environment

4.4.1 Key issues

The K4 site has been assessed as being at 'low' risk of Tidal flooding from the Swale due to the existing topography of the CHP Development Area ranging from 8.80m AOD to 9.20m AOD.

The nearest watercourses to K4 are several drain networks, which lie to the east and south.

The EA flood map for Swale Borough Council indicates the entire K4 site lies within Flood Zone 1 (FZ1), with low probability of flooding, assessed as land having a less than 1 in 1,000 annual probability of river or sea flooding and existing flood defences located 400m to the east of the site are made up of raised walls and embankments which provide an adequate 1 in 1,000-year standard of protection. The construction access road and laydown area are located within Flood Zone 3.

Although the K4 ground surface is currently entirely hardstand, a temporary increase in less permeable area may occur due to the construction compounds potentially increasing the temporary flood risk to the surrounding area.

During construction, there is a potential risk of accumulation of standing water on site and accidental discharges of untreated run-off whilst the development and the operational surface water drainage system are being constructed.

There are several potential pollutants which could arise during construction, and hence which may affect the water quality of receiving watercourses. These are outlined below:

- Fine particulate materials (e.g. silts and clays);
- Cement;
- Oil and chemicals (from plant machinery and processes); and
- Other wastes such as wood, plastics, sewage and rubble.

These pollutants may be present because of normal site activities, incorrect storage of oils and chemicals and/or accidental spillage. The significance of the incident would be dependent on the nature of the pollutant, on the emergency response adopted and its timing and effectiveness.

4.4.2 Mitigation measures

Temporary drainage mitigation techniques including, but not limited to, run-off interceptor channels would be installed prior to the construction of the formal drainage to ensure that discharges from the K4 construction site are controlled in quality and volume. This may include the use of settling tanks and / or ponds to remove sediment, temporary interceptors and hydraulic brakes.

Construction material and / or spoil within construction compounds will be positioned away from drainage systems or surface watercourses and field drainage and no hazardous substances will be stored within proximity of the drainage network.

Any area at risk of spillage, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) will be bunded and carefully sited to minimise the risk of hazardous substances entering the drainage system or the local watercourses. Additionally, all bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any potential leakage / spillage event.

All construction work will be undertaken in accordance with good practice including:

- Prevention of surface water being affected during earthwork operations. No discharge to surface watercourses will occur without permission from the EA
- Prevention of surface water being affected during earthwork operations. No discharge to surface watercourses will occur without permission from the EA
- Wheel washers and dust suppression measures to be used as appropriate to prevent the migration of pollutants
- Regular cleaning of roads of any construction waste and dirt to be carried out
- Water quality monitoring will be carried out throughout the construction phase to ensure no discharge of pollutants or increase in suspended sediments occurs in accordance with the existing site discharge licence (Ref: EPR BJ7468IC-V009)
- Refuelling of machinery will be undertaken within designated areas where spillages can be easily contained. Machinery will be routinely checked to ensure it is in good working condition
- Any tanks and associated pipe work containing substances included in List 1 of the Groundwater Directive will be double-skinned and be provided with intermediate leak detection equipment

The following specific mitigation measures for the protection of surface water during construction activities will be implemented:

- Management of construction works to comply with the necessary standards and consent conditions as identified by the EA and where there is a risk of contamination to a watercourse, control measures will have been identified and where necessary agreed
- Discharge consents for dewatering will be sought from the EA before discharge into a watercourse takes place. A briefing highlighting the importance of water quality, the location of watercourses and pollution prevention included within the site induction
- Areas with prevalent run-off to be identified and drainage actively managed, e.g. through bunding and/or temporary drainage
- Bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage. Bunds used to store fuel, oil etc. to have a 110% capacity
- Disturbance to areas close to watercourses reduced to the minimum necessary for the work
- Excavated material to be placed in such a way as to avoid any disturbance of areas near to the banks of watercourses and any spillage into the watercourses
- Construction materials to be managed in such a way as to effectively minimise the risk posed to the aquatic environment
- All plant machinery and vehicles to be maintained in a good condition to reduce the risk of fuel leaks
- Drainage works to be constructed to relevant statutory guidance and approved prior to the commencement of construction
- Consultation with the EA to be ongoing throughout the construction period to promote best practice and to implement proposed mitigation measures
- All dewatering operations will be operated under a Costain permit to work
- Where feasible, concrete protection socks will be placed over discharge shuts and concrete washout operations will be undertaken off-site at the applicable concrete company's premises. Where this is not possible, cleaning of concrete and mortar batching/delivery plant and equipment shall only be carried out at agreed locations where resulting effluent cannot flow into watercourses and drains
- Wherever possible the use of concrete is to be minimised
- The site offices will make use of a rain harvest water system to provide recycled water for wheel wash, tool wash and dust management instead of the mains
- All fuels, oils and chemicals shall be stored in containers specifically manufactured for the purpose, to prevent contamination in the event of spillage or damage. Tank capacity shall be checked before delivery to prevent overfilling
- Fuel tanks or bowsers must comply with the specifications set out in the regulations. All ancillary equipment (hoses, pistols, valves etc.) will be kept within secondary containment. Tanks and bowsers must be lockable and kept locked when not in use
- Requirement to use Enviropad's or Plant Nappies over traditional drip trays
- Fuel stores will be equipped with bunds and Enviropad's or Plant Nappies
- Diesel generators must be equipped with Enviropad's or Plant Nappies
- The contents of storage containers clearly marked to prevent cross contamination
- Arising's from earthworks and piling shall only be stored on site in areas designated for the purpose and should be regularly inspected to ensure that no surrounding ground or watercourse is being contaminated by runoff or seepage
- A site plan will show refuelling and storage arrangements for K4 and must form part of the site induction. A refuelling procedure for the site will also be developed and delivered to all contractors during inductions and toolbox talk training

Refuelling arrangements

Costain will nominate a Fuel Storage Coordinator and all storage locations / mechanisms will be inspected weekly and their condition and any improvement measures recorded. The key criteria for storage are:

a) Petrol

- The maximum size of the container should be 20 litres
- The containers should be suitably constructed and adequately labelled
- Containers should be stored in the fuel store within the site compound
- Ideally the storage place should be more than 6m from the nearest building, highway or footpath
- Any storage area should be bunded or the fuel store must be leak-proof
- When used remotely on site, to fuel pumps or generators, containers should be placed on a drip tray and a spill kit must be on hand in case of spillage
- Drip trays must be emptied and cleaned on a regular basis

b) Diesel

- Diesel stored in a tanker / bowser shall be clearly labelled and locked when not in use
- All tanks and bowsers must be fully bunded
- When a diesel bowser is used on site there should be a spill kit on hand in case a spillage occurs
- When diesel is stored on site in small containers they should be adequately constructed, correctly labelled, and placed on a drip tray to contain any spillage that may occur and protected from impact damage

Refuelling procedure

- No plant or machinery is to be refuelled within 10m of any watercourse without a specific Risk Assessment and Work Package Plan being in place
- Where possible, all plant must be taken to the main fuel tank for refuelling. For large or stationary plant and equipment a bunded fuel bowser shall be filled from the main tank to distribute the fuel
- A spill kit or absorbent granules must be kept adjacent to the main tank, carried with any mobile bowser and kept in the machines to be refuelled. The operative carrying out the refuelling operations shall check this prior to transferring any fuel
- Prior to transferring any fuel the person carrying out the operation must dip the tank to be filled to assess the quantity required
- All ancillary equipment (hoses / pistols / valves etc.) must be kept within secondary containment
- When not in use, nozzles on fuel tanks / bowsers must be securely padlocked to prevent accidental / deliberate discharge

Table 14 – Water management plan

Report Details – Output Required
A surface water and flood management plan will be prepared to support the site enabling and construction phase of works.

4.5 Contamination

4.5.1 Key issues

The presence of concrete hardstanding across much of K4 is in a reasonable state of repair. Part of this slab will be removed prior to construction commencement. Made Ground is likely to be present underneath the concrete hardstanding, however high levels of contaminants within the soil are not anticipated to be present based upon previous ground investigation information as presented in the supporting DCO documentation. All current potential sources of contamination appear to be suitably managed and maintained, thus minimising the potential for contamination migration into the underlying soils because of current site activities.

DSS are currently instructing a ground investigation to be undertaken over the K4 site as part of site permitting delivery and design of foundations for K4 and for surrender of the currently operational K1 site. If any significant contamination is established during the ground investigation, DSS will plan for the K1 part of the site to be remediated back to a baseline condition. This will take effect prior to the planned construction of K4 effectively rendering the condition of the land underlying the footprint of K4 as 'clean' and suitable for use. Once the geochemical results are available, any significant change to these conclusions will be added in to this Outline CEMP.

Previous ground investigations undertaken near K4 have not identified any unacceptable risks to human health from the presence of chemical contamination in Made Ground and shallow soils. Available information indicates that potential sources of contamination relating to historical land-use should they occur are likely to be localised rather than being widespread across the Site.

Localised areas of elevated concentrations of inorganic and organic contaminants have been observed in shallow perched water within the Made Ground. The ES risk assessments conclude that there were no unacceptable risks to deep groundwater in the Lambeth Group / Thanet Formation or the Chalk at depth.

The construction of piled foundations that will fully penetrate the underlying London Clay Formation may provide a pathway for the downward migration of contamination into the Lambeth Group and Thanet Formation (Secondary A aquifers). Due to a possible hydraulic connectivity between the Secondary A aquifers and the Swale Estuary, there is a potential for any contamination within groundwater to migrate to the surface water body.

Although potential sources of ground gas have been identified near the Site, due to the temporary nature of construction works and the absence of significant excavations, ground gas risks to human health are negligible. However, as previously discussed DSS are currently commissioning a site investigation across the footprint of the proposed K4 site. Should these investigations identify any unacceptable risks regarding ground gas, gas protection measures will be duly defined and subsequently incorporated into the design of the plant and installed during construction.

4.5.2 Mitigation measures

Although the impact assessment has not identified any significant effects to human health and the environment because of the construction phase of the Proposed Development, there are several measures that will nevertheless be implemented during K4's construction to minimise potential impacts. These measures are standard in construction Projects and are in line with current industry good practice for construction on brownfield sites:

- Stockpiling of contaminated materials would be avoided where practicable. Where it is necessary, stockpiles would be located on areas of hard-standing or plastic sheeting to prevent contaminants infiltrating into the underlying ground.
- The implementation of dust suppression measures during construction to minimise nuisance dust emissions during the works.
- Any necessary licences would be obtained for the storage, treatment and disposal of waste.
- Where significant unforeseen contamination is identified e.g. hydrocarbons, fibrous asbestos, during enabling, work will stop and further investigation will be undertaken to establish levels of contamination. Where remediation is required, on-site treatment, including bioremediation would be carried out wherever practicable.
- Suitable management and control of shallow groundwater during excavation works to minimise the potential for the spread of contamination contained with the water.
- The disposal of solid waste, including surplus spoil, would be managed to maximise the environmental and developmental benefits from the use of surplus material and to minimise any adverse effects of disposal. In general, the principles of the waste management hierarchy, reduce-reuse-recycle would be applied. Prior to commencement of construction works, a Site Waste Management Plan would be produced. This would predict all waste streams to be produced including volumes expected and to identify the waste management action proposed for each different waste type in line with the waste hierarchy.
- Potential waste arising from excavation would be sampled and analysed to determine the waste classification required to establish relevant waste streams, suitability for reuse/recycle and disposal/storage requirements.
- Excavation works would be carried out in such a way to enable effective segregation of clean materials for reuse on site wherever practicable. It is anticipated that 'clean' concrete and masonry would be crushed for reuse for backfilling and other purposes, or would be sent offsite for recycling or recovery with disposal only as a final resort. Material would only be re-used on site in accordance with the Environmental Permitting Regulations or appropriate approved Code of Practice, e.g. Contaminated Land: Application in Real Environments (CL:AIRE) or Waste Resource Action Plan (WRAP).
- Storage of hazardous materials, including fuel, during the construction phase will utilise industry best practice e.g. storage in bunded areas, to minimise the potential for spills / leakages to impact soil and groundwater.
- The implementation of suitable measures in line with the Construction Design Management Regulations (2015) would manage any risks posed to human health. These measures will include the provision of suitable Personal Protective Equipment (PPE) and welfare facilities.

Storage of stockpiles

Excavated material that is stockpiled on site for further use will be managed to prevent silty run-off or losses due to wind. When stockpiling material, the following control measures will be considered:

- Always segregate different grades of soil, i.e. subsoil from topsoil
- Where feasible locate all stockpiles at least 10 meters from watercourses
- Temporary stockpiles should be no more than 2m high to prevent damage to soil structure. Permanent bund features heights should be constructed in-line with approved planning permissions
- Seeding with suitable grass species may help prevent slippage and erosion from wind or rain. Ensure adequate weed control
- A silt fence may be constructed at the base of the pile using a suitable geotextile
- Direct surface water away from the stockpiles to prevent erosion at the base

Dust and mud prevention

- The main entrance / exit utilised by operational vehicles should be regularly monitored to ensure that excessive mud does not affect the adjoining highway
- A sweeper will be employed when ground conditions are unsatisfactory and may lead to mud on the road or dust emissions
- Dust control measures will be employed when using cutting equipment
- Wheel and boot cleaning facilities will be installed

Piling works

A piling risk assessment will be undertaken to determine the most suitable piling technique to be implemented, to minimise the potential for the downward migration of contamination within the Made Ground into the Secondary A aquifers (Lambeth Group and Thanet Formation). This risk assessment should also be cognisant of the requirement to minimise disturbance to ecological receptors through noise and / or vibration impacts.

Table 15 – Piling risk assessment

Report Details – Output Required
A piling risk assessment will be prepared to support the site enabling and construction phase of works.

4.6 Landscape and visual

4.6.1 Key issues

Direct effects on townscape character relate to the Sittingbourne Industrial/Commercial Area, which has a poor to ordinary condition and local or low value. The character area's sensitivity to change through the effects of demolition and construction activities within the Site would be low due to the similarity in the nature and scale of the proposed activities and the existing site conditions and neighbouring K1 CHP infrastructure. However, construction activities would include cranes and high-level plant which would be slightly discordant in the industrial context. The direct effect of the large-scale construction works on the open area of K4 would create a small magnitude of change to the character, which would be adverse in nature, but only short term in duration. The overall significance of effect on the Sittingbourne Industrial/Commercial character area would be slight adverse in the day.

4.6.2 Mitigation measures

Due to the industrial nature of the Site and immediate context, no specific landscape mitigation measures are proposed at this stage as they would not achieve a meaningful reduction in landscape, townscape and visual effects. The K4 CHP design incorporates buildings, infrastructure, hardstanding and access roads which extend over the whole K4 site and would be contiguous with existing industry at Kemsley to the north, south and west. The incorporation of landscape planting, earth shaping or screen fences within the proposals would not, due to the scale of K4, achieve a screening function.

4.7 Noise and vibration

4.7.1 Key issues

The nearest residential properties are over 500 m from the main construction area of K4. Given the separation between the K4 site and the nearest residential receptors, construction

activities are unlikely to result in significant adverse effect due to noise. Three noisy phases of construction works are considered to exist during the construction of K4:

- piling works;
- general excavation; and
- concrete works.

Other construction activities, such as installing plant, would be expected to result in noise levels below that for those identified above.

During piling, noise levels are predicted to be a maximum of 40dB_{LAeq} at any surrounding residential area, as determined by the noise model produced by RPS. For daytime and evening works, this would be of negligible magnitude under the criteria adopted from BS5228. For night-time works, a level of 40 dB _{LAeq} just reaches the minor adverse impact criteria. Construction noise levels during general excavation and concreting would be lower than for piling.

Construction of the facility will also necessitate several construction vehicles accessing the Site, a high proportion of which will be HGVs. Construction traffic will consist of mix of light and heavy commercial vehicles to transport materials and equipment to and within the site. Given that the site is accessed by well maintained and appropriate roads, already serving the adjacent industrial areas, any increase in vehicle movements is unlikely to result in anything but a negligible increase in road traffic noise. Any noise change arising from change in traffic flows due to additional construction vehicles would result in a noise increase of less than 1dB.

Surface plant such as cranes, compressors and generators are not recognised as sources of high levels of environmental vibration. Similarly, whilst vibration from impact piling might result in higher vibration levels at source, vibration level would be insignificant beyond the immediate K4 development area.

The nearest residential properties are over 500m from the main construction area of K4. From BS 5228-2, vibration levels decrease rapidly with increasing distance and is also attenuated by energy absorption in the soil and by obstacles and discontinuities. Given the separation between the K4 site and the nearest residential receptors, vibration from construction activities will be significantly below minor significance criteria. As such, vibration is considered to have no or negligible impact magnitude, and will have no significant adverse effect. Notwithstanding this, vibration impacts will be minimised to ensure any sensitive activities and machinery associated with DSS's Mill and existing generation plant on site are not adversely affected by the works.

4.7.2 Mitigation measures

The following general measures will be undertaken to control the noise on the site:

- Where practicable, deliveries to site will be conducted during normal working hours
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and will be maintained in good effective order. Plant will be inspected on arrival to site
- Machines in intermittent use will be shut down in intervening periods of non-use or, where this is impracticable, they will be throttled down to a minimum
- All plant enclosures will be kept closed when in use
- Methods of construction and plant have been selected to minimise noise and reduce the use of percussive equipment
- Static plant will be located to optimise screening and/or distance attenuation in relation to occupied residential properties and fitted with suitable enclosures where practicable

- Where practicable, concrete pours will be programmed to avoid overruns and enable work to be carried out in core hours
- Where possible plant will be fitted with broadband reversing alarms
- All personnel on site will undergo noise specific environmental training under the supervision of the Costain Environmental Manager
- Enclosures or three-side screens will be erected around static plant where necessary to attenuate noise

Good practice guides will be provided to all operatives through the provision of toolbox talks and an appropriate induction. The induction will inform operatives of good practice to be employed outside normal working hours including, amongst other issues, ways of limiting unnecessary noise during the night-time working

Vibration

Concerns could be raised in terms of potential building damage due to sheet piling and other construction activities. For mitigation of direct effects of ground vibrations on structures from installation of driven and impact piles, the following measures should be considered:

- Pile driving systems that are designed to specifically reduce impact-induced vibration by using torque and down-pressure or hydraulic static loading should always be considered first
- Installation of low soil displacement piles, e.g. H-piles, instead of high soil displacement piles, e.g. concrete piles, can reduce ground and structure vibrations
- Hard pile driving to a depth about 10m from the ground surface may increase ground vibrations, but hard pile driving at a greater penetration depth induce less ground vibrations
- Predrilling and jetting may be helpful for overcoming the high penetration resistance in upper soil layers
- Pile driving operations should start nearby the existing structures and continue away from the structures because previously driven piles act as a shield and soil movements are greater in the direction away from the stiff zone near the driven piles

4.8 Waste Management

4.8.1 Key issues

Where Costain are responsible for, or have an influence at the design stage, the use of reclaimed or recycled products, materials and components shall be considered.

The design where possible shall also accommodate the use of standard sizes to eliminate waste during the construction process. When purchasing materials, consideration shall also be given towards those that may have been recycled, if the specified requirements can be achieved. Care shall also be taken to ensure that only the required amount of material is purchased to avoid waste and where possible components shall also be ordered „to fit“, avoiding off cuts and waste on site.

100 % of waste that is generated on-site is required to be diverted from landfill. Costain will monitor all waste leaving site and hold all appointed waste management contractors accountable for producing actual statistics of waste diverted from landfill. The waste management targets/achievements will be discussed at relevant Project progress meetings.

Waste shall include:

- any substance which constitutes scrap material, an effluent or other unwanted surplus substance arising from site;

- any substance or article which requires to be disposed of as being broken, worn out, contaminated or otherwise spoiled; and
- anything which is discarded or otherwise dealt with as if it were waste, unless proved to the contrary.

4.8.2 Mitigation measures

The amount of waste material at K4 will be reduced as far as reasonably practicable, through implementation of the waste hierarchy: eliminate, reduce, reuse, recycle, recover, disposal.

Waste minimisation shall also be implemented by ensuring the following measures:

- Storage: Material shelf life is not exceeded, damage and contamination is prevented including loss, theft and vandalism. Storage and / or stacking are in accordance with manufacturer or supplier guidelines.
- Delivery: Avoiding damage during unloading, delivery to correct location on site and acceptance of materials and components only in accordance with the order.
- Handling: Materials and components are handled using correct methods, in a minimal fashion.
- Protection: Damage is avoided by provision of temporary protection where applicable.
- Issue: Where practicable, issue of materials or components is controlled, such as through secure compounds or stores, to prevent unnecessary opening of multiple packs or pallets.

Waste storage and care

The Waste (England and Wales) Regulations 2011 requires that a waste holder (producer, carrier or disposer) takes all reasonable steps to ensure that there is no unauthorised deposit, treatment, keeping or disposal of controlled wastes, that it does not escape from their control, and is only transferred to an authorised person.

Wherever possible different types of waste shall be segregated as they are produced to allow for correct disposal and prevent cross contamination. Hazardous waste must not be mixed with non-hazardous or inert waste. Only containers and / or vehicles fit for the purpose shall be used, and covers / lids provided where necessary to prevent spillage or contents being blown away.

Waste carriers licences

Before the waste is removed from the site, it shall be ensured that the selected waste carrier is registered with the Environment Agency. Waste Carrier Licences must be obtained from the carrier and retained in the Costain site/office file. The Waste Carrier Licence must be valid (in date) and details must match those of the carrier i.e. the company name and address.

Details of all the waste carriers used must be recorded in the Costain Site Waste Management Plan SHE-T-321 and the Waste Carrier Licences retained on file and updated as required.

Waste Transfer

Waste must be described in a manner that permits its safe handling and management and that any transfer of waste is accompanied by a written description of the waste, using a waste transfer note. In addition to its "List of Waste" six-digit code (also called a European Waste Code EWC) and its associated description, any waste should also be described in a

way that identifies any properties relevant to its handling, along with the correct Standard Industrial Classification (SIC code).

The transfer note records the transfer of waste between two parties. If waste is first taken to a waste transfer station, then this should be recorded as the location on the waste transfer note. All operations are undertaken to conform with the Hazardous Waste (Miscellaneous Amendments) Regulations 2015 and Hazardous Waste Consignment Notes and Non-Hazardous Waste Transfer Note should be available as required to comply with regulation 12 of The Waste (England & Wales) Regulations 2011.

Inert and non-hazardous waste

A transfer note shall be completed for all inert and non-hazardous waste leaving the site, which shall detail the following:

- description of the waste;
- List of Waste (LOW) six-digit code;
- Standard Industrial Classification (SIC code)
- the type of container;
- quantities;
- names, signatures, addresses and licence numbers of transferor and transferee;
- time and place of transfer;
- type of transport and vehicle registration number; and
- the location the waste is being transported to (not mandatory but preferable).

Hazardous waste

Hazardous waste consignment notes must be completed for all hazardous waste leaving site. The consignment note must include:

- the premises code;
- description of the waste, including the process giving rise to the waste;
- list of Wastes (LOW) six-digit code;
- Standard Industrial Classification (SIC code)
- quantity (kg);
- container type, number and size;
- physical form;
- hazard codes (as applicable);
- chemical / biological components of the waste and their concentrations;
- names, addresses and signatures of the consignor, carrier and consignee of the waste; and
- names, signatures, addresses and licence numbers of the consignor, carrier and consignee.

Exemption particulars

There are certain wastes that are excluded from the scope of the 'waste framework directive' notably:

- Uncontaminated soil and other naturally occurring material excavated during construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated.

These arisings can be used as a material and not a waste, although some evidence may be required to prove the material is uncontaminated and / or certain to be used. Certainty of use can be demonstrated through materials management plans or through the waste actions section of a site waste management plan. Utilising the CL:AIRE code of practice

(Contaminated Land Application in Real Environments) allows materials arising on site (e.g. uncontaminated and contaminated soils, rock, concrete, bricks, made ground, road planings and sub base) to be reused as a material and not classified as a waste.

This option will require upfront investigation works and production of a Materials Management Plan (MMP), which needs to be signed off by a 'Qualified Person' and a Qualified Person Declaration from needs to be sent to the EA.

The option available for K4 via CL:AIRE:

- Site of Origin – allows the reuse of both uncontaminated and contaminated material on the site it was produced.

A MMP will be prepared for the site to support the main Civils enabling works on site.

Similarly, the WRAP protocol for recovery of aggregates can be used as applicable for K4. This protocol allows certain waste products to be processed so they can be considered as a material and no longer waste. The protocol can only be used for inert granular wastes, e.g. concrete, brick, tiles and ceramics, and glass. The protocol also allows the use of road sub base and bituminous bound planings. The material must be produced using a documented process, and testing must be carried out to prove that the material produced is comparable with a virgin aggregate of the same specification. The need to employ the WRAP QP may arise at K4 if the option to import recycled aggregates is selected over virgin aggregates, which should always be the driving priority in terms of maintaining sustainable development.

Certain low risk waste activities can be carried out using waste exemptions, these come under the categories of Use, Treatment, Disposal and Storage. These exemptions allow waste activities using relatively small amounts of waste to take place with just a simple notification to the EA. Once the form is completed and submitted, the EA have 5 days in which to respond. Once confirmation has been received that the exemption has been registered the activity can commence.

Exemptions are registered online and should always be discussed with the Costain Environmental Manager before it is completed. The most common exemption that will be used on sites is U1 Use of Waste in Construction, this allows the reuse of concrete, bricks tiles and ceramics, glass, soils and road planings. Under a U1 the following can be used:

- Up to 5,000 tonnes of concrete, brick, tiles and ceramics
- Up to 1,000 tonnes of soil and stones
- Up to 1,000 tonnes of planings in footpaths and tracks (unbound surfaces)
- Up to 50,000 tonnes of planings for construction of roads (bound surfaces)

The need to register a U1 exemption may arise at K4 due to the need to recycle aggregate material used in a piling mat and the need to recycle any demolition material.

Control Measures

Detailed below are the site-specific controls for K4:

- Through correct design and procurement procedures only the correct amount of materials will be ordered, reducing any construction waste
- All waste materials will be disposed of in the correct waste container and removed from site utilising a registered waste carrier. The waste material will be separated and all skips and drums labelled or signed. Separate waste skips will be provided for metal, wood, cardboard, plastic, general waste, and hazardous waste as required
- All waste storage bins, skips, etc. will be available at the work site – relevant to the type of waste being produced. The main works Civil Contractor will supply and arrange delivery of all waste bins and skips required

Waste documentation

Keeping and checking waste documentation is a very important part of the waste management process and helps ensure ‘duty of care’ is met. Waste transfer notes must be kept for a minimum of two years and hazardous waste consignment notes, a minimum of three years. Documentation must be kept in a file on site and be available for inspection at any time.

All waste documentation must be checked at the time of collection to ensure the information is complete and accurate. Any errors must be corrected at the time with the agreement of the waste carrier and destination site if necessary. Cradle to grave audits will occasionally be carried out to ensure that the Costain’s ‘duty of care’ is being fulfilled as per procedure SHE-H-447 How to Manage Waste on Site and Remove.

Monitoring

Monitoring of control measures is conducted by weekly SHE inspections carried out by the Site team, and monthly, by the Construction Manager or monthly Environmental Inspection.

The type and quantity of materials arising on site will be continually reviewed and site set-up changed to maximise on reuse or recycling. This SWMP will be included as an agenda item at the monthly construction meetings and progress communicated. Costain will carry out periodic audits of selected waste management contractors waste management process.

The SWMP will be reviewed and updated at least every six months during the construction phase. The plan will be updated to reflect the progress of the Project.

A Final Review must take place within three months of Project completion. Once the Project has been completed and the Final Review carried out, it is necessary for this document and the review documents to be kept for at least two years. Note – the requirement to review is included within the Project Review Agenda, part of The Costain Way.

Table 16 – Review of SWMP

Action	Date	Name
Initial completion date of SWMP	TBC	TBC
First review	TBC	TBC
Second six monthly review	TBC	TBC
Third six-month review	TBC	TBC
Final review of SWMP	TBC	TBC

4.9 Light

4.9.1 Key issues

The Clean Neighbourhoods and Environment Act 2005 amended section 79(1) of the Environmental Protection Act 1990 to include under the statutory nuisance regime (England) “artificial light emitted from premises to be prejudicial to health or a nuisance” (commenced on 6 April 2006).

Light nuisance causes numerous complaints relating to loss of privacy or the inability to sleep due to lights shining into windows of residential properties. There is no all-embracing definition of what constitutes nuisance. The emphasis, however, is on invasion of privacy and unreasonable interference with the convenient use of land.

4.9.2 Mitigation measures

Where appropriate, lighting to site boundaries will be provided and illumination will be sufficient to provide a safe route for the passing public. Precautions will be taken to avoid shadows cast by the construction activity related features e.g. noise screens on surrounding footpaths, roads and amenity areas.

Lighting will also be designed, positioned and directed so as not to unnecessarily intrude on adjacent buildings, wildlife sites and land uses and to prevent interference with nearby residents, road traffic and signing or passing motorists.

5.0 EMERGENCY RESPONSE

Any emergency response action required during the construction phase will be undertaken in accordance with the accident and disaster mitigation measures as specified in ES chapter 2 'Site Description and Proposed Development' paragraphs 2.8.10 - 2.8.13.

5.1 Spill management

The purpose of this emergency response section is to ensure the effective management and co-ordination of resources in the event of a leakage or spill or any other environmental emergency occurring on K4. It also defines the criteria for the reporting and the investigation of leakages and spills.

Incidents are logged and closed on Costain's web-based Capture system. Where an incident occurs on site the Costain Environmental Manager, Project Manager and E.ON and DSS will be informed within 2 hours of the incident occurring. A list of contacts is given below:

Table 17 – Reporting of environmental emergencies

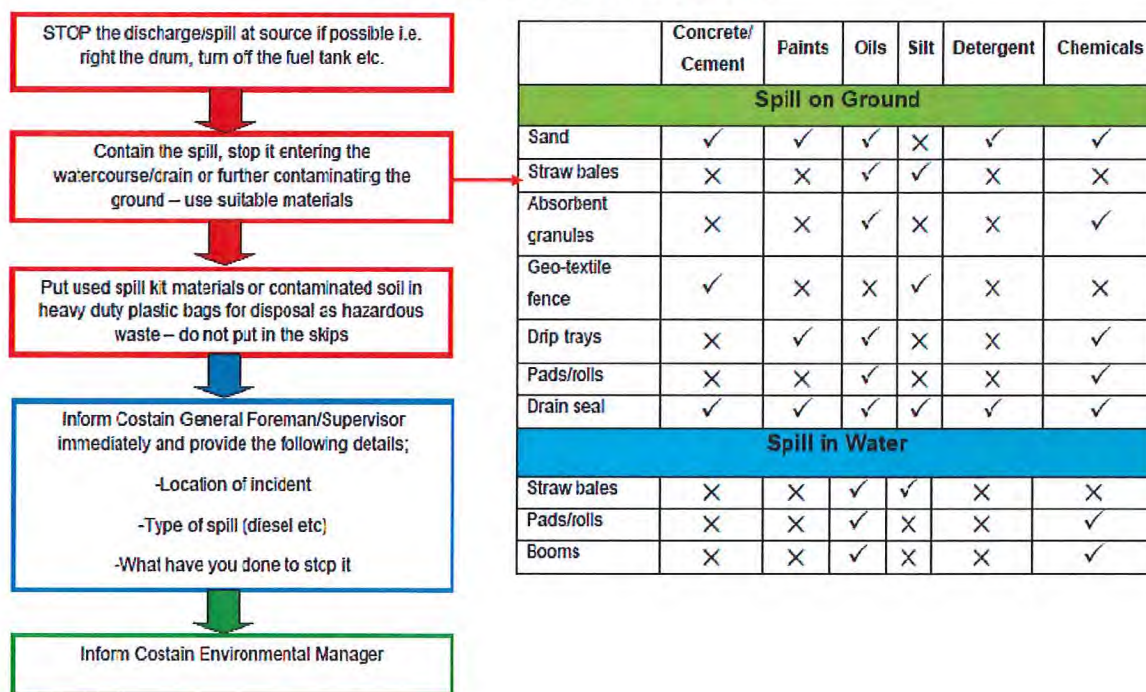
Organisation	Contact	Number
Costain Environmental Manager	Gordon Williams	07876875850
DSS Environmental Manager	Jo Scott	01795 518900
Local Authority EHO	TBC	TBC
Environment Agency	Incident hotline	0800 807060
Emergency spill response	Adler and Allan	0800 592 827
Emergency spill response	CSG Lloyds	0800 5873 133
National Grid Gas	24-hour gas emergency number	0800 111 999
UK Power Networks	24-hour emergency / supply loss	0800 783 8866
British Telecom	UK based corporate sector customers	0800 028 5314

5.1.1 Guidance on when E.ON will call the EA

- Spillages of Haz-chem listed chemicals
- Spillages of products with polluting potential
- Hydrocarbon spillages (e.g. oil, paraffin, diesel, petrol) greater than 100litres
- Incidents by / near a watercourse
- Incidents at EA identified "sensitive" areas
- Major incidents in combined drainage areas
- At times, there may be incidents that do not fall into any precise category, and if there is any doubt, the EA should always be contacted

EMERGENCY PROCEDURE

EMERGENCY SPILL PROCEDURE



5.2 Management of unexpected contamination

- Detailed methodologies for dealing with unexpected ground conditions, i.e. those that have not been encountered in the ground investigations to date, will be described by all Civil/site enabling works contractor’s as part of their method statements.
- Sub-contractors to Costain will familiarise themselves with the existing ground conditions as described in the associated DCO ES reports.
- Any discoveries of unexpected contamination, together with information characterising the nature and extent of any such contamination, and recommendations for remedial actions (or otherwise) will be reported, as required, to the relevant regulatory authorities including the EA and PCO.
- Works would be halted in the affected area on discovering unexpected contamination and an appropriately qualified and experienced environmental engineer would be consulted. Works in the affected area would only recommence on the advice of the appointed engineer, when it can be confirmed that no ongoing risk is posed to human health or the environment and appropriate mitigation measures have been put in place.
- Costain will keep detailed records of the ground conditions, including marked up plans, visual and olfactory evidence of contamination and photographs, and record the actions undertaken to remove any unexpected contaminated ground or contaminated sub-surface structures within the site.
- If the unexpected ground conditions result in a change to the programmed works, Costain will provide a remediation method statement in advance of the work, for approval by Contaminated Land Officer at SBC.

- If the unexpected contamination requires excavation, the material will be stockpiled prior to testing. Soil samples will be collected from stockpiles and scheduled for waste classification and WAC testing.
- Measures will be taken to restrict dust and surface water run-off from temporary stockpiles.
- Costain will arrange for waste classification and compliance testing of the excavation arising to be carried out in accordance with the Landfill Regulations prior to disposal to landfill. Costain will agree the testing frequency with the accepting licensed landfill operator(s).
- All contaminated water, including any sludges arising, will be assessed to determine whether it requires treatment on-site prior to discharge to foul sewer, in agreement with the local water authority, or if treatment to the required discharge consent standards is not achievable, dispose of the contaminated water off-site to a suitable licensed facility.
- It may be possible to discharge treated groundwater back to ground in the locale of the temporary abstraction, subject to approval by the EA.



6.0 SUPPORTING FORMS

1. Environmental Inspections
2. Environmental Incidents
3. Recording public feedback/complaints
4. ENVID
5. Environmental Control Plan
6. RAMS Review

Location: K4 Date: SHE Systems Co-ordinator's Report No:
 Carried out by (Print name): Signature: Company: Costain
 For action by: Site Team For information to: Sub-contractor(s)

ITEMS CHECKED – initial against item if satisfactory

Risk Assessment/Method Statements	General cleanliness / condition	Refuelling	Drainage and markings
Training (inc Induction & Tool Box talks)	Noise	LPG & Diesel storage	Waste Management – storage
Co-ordination of SHE (meetings etc)	Vibration	Pests and infestations	Waste management – segregation
Documentation (Registers; records; Sub con policies etc)	Odour	Dust	Energy - conservation
Ecology	Nuisance	Welfare arrangements	Energy - monitoring
Landscaping & Tree Protection	Mud and debris	Complaints and community	Emergencies-
Archaeology	Hazardous substances – storage and use	Vehicle arrangements	- Environmental
Water Environment	Soils Management	Subcontractor activity	- Spill Response
		General building condition	- Major incidents

ITEM NO.	PHOTO	COMMENTS (DEFECTIVE ITEMS)	BY WHOM	ACTION REQUIRED/TAKEN	DATE COMPLETE/ INITIALS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

ENVIRONMENTAL INCIDENT

Contract Name & Address		Sector		Date of Incident		Time of Incident	
Type of Environment Incident <i>(Insert x against incident type)</i>							
Major		Significant		Minor		Near Miss	
Nature of Incident <i>(Insert x against applicable items)</i>							
Water pollution				Noise pollution			
Air pollution				Ecological damage			
Land contamination				Spill			
Waste (Incorrect management)				Storage (Incorrect)			
Architectural & Heritage Damage				Other			
Nature of work at the place of the accident:							
Incident Location (Attach plan and photographs)							
Date of 1 st notification to Project:				<i>Insert date</i>			
Date of 1 st notification to Group				<i>Insert date</i>			
Date reported to Environment Agency/LA:				<i>Insert date</i>			
Brief factual details of the incident: <i>(What, where, when, who and emergency measures taken)</i>							
Witness(s): <i>(State full name)</i>							
Costain CDM Role: <i>(Principal Contractor; Contractor, etc.)</i>							
Contractors/parties/regulator involved: <i>(Identify all contractors/parties involved and contractual relationship with Costain. Identify all regulator involvement including action taken; time on site and resulting correspondence)</i>							
Plant/Equipment involved: <i>Please state description of plant; identifying numbers; name of owner if other than Costain, and any details of any damage</i>							

CLIENT DOCUMENT NO.		CONTRACT DESCRIPTION :				DOCUMENT NO.		REV.
DATE	BY	CHECKED	APPROVED	REVIEWED	ALTERATIONS	Page 1 of 6		REV.

Environmental Aspect	Environmental Impact	Control Measures	Consequence (C1-C5)	Frequency (F1 - F5)	Impact (I1 - I4)	Comments	Actions
RELEASES TO ATMOSPHERE							
Continuous Venting Sources, e.g. produced water flash vessel	<ul style="list-style-type: none"> Specify Nature of pollutant, hazard posed, pathway and receptor 	<ul style="list-style-type: none"> 					
Compressor Seal Gas System	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
On-line sample system venting	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Automatic Tank Breathing	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Combustion Products	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Waste incineration	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Fugitive Emissions from pipework & valves	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Pigging operations	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Off Spec Venting	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Maintenance Venting	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Start-Up Flaring	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Start-Up Purging	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Shut-Down Purging	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Emergency depressurisation	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Emergency Flaring	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Others?	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					

CLIENT DOCUMENT NO.		CONTRACT DESCRIPTION :		DOCUMENT NO.		REV.
DATE	BY	CHECKED	APPROVED	REVIEWED	ALTERATIONS	REV.
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Environmental Aspect	Environmental Impact	Control Measures	Consequence (C1-C5)	Frequency (F1 - F5)	Impact (I1 - I4)	Comments	Actions
RELEASES TO WATER							
Boiler Blowdown	<ul style="list-style-type: none"> Specify Nature of pollutant, hazard posed, pathway and receptor 	<ul style="list-style-type: none"> 					
Cooling Tower Blowdown	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Liquids sampling	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Liquid Knockout	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Sewerage treatment	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Domestic waste water disposal	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Off-specification product disposal	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Maintenance Flushing & Draining	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Rainwater runoff	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
Other?	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 					
NOISE & VISUAL IMPACT							
Normal Operation Noise	<ul style="list-style-type: none"> Specify Nature of pollutant, hazard posed, pathway and receptor 	<ul style="list-style-type: none"> 					

CLIENT DOCUMENT NO.		CONTRACT DESCRIPTION :		DOCUMENT NO.		REV.
DATE	BY	CHECKED	APPROVED	REVIEWED	ALTERATIONS	REV.
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Environmental Aspect	Environmental Impact	Control Measures	Consequence (C1-C5)	Frequency (F1 - F5)	Impact (I1 - I4)	Comments	Actions
Compression equipment noise	•	•					
Pressure letdown facilities	•	•					
Maintenance venting noise	•	•					
Emergency depressurisation/ flaring	•	•					
Site lighting	•	•					
Equipment height	•	•					
Other?	•	•					
•	•	•					

ODOUR

Sewage Treatment	• Specify Nature of pollutant, hazard posed, pathway and receptor	•					
Mercaptans	•	•					
Odourisation equipment	•	•					
Gas release	•	•					
Other?	•	•					
•	•	•					

ENERGY EFFICIENCY

Compressor driver	• Specify Nature of pollutant, hazard posed, pathway and receptor	•					
Power generation facilities	•	•					
Boilers	•	•					
Process heaters	•	•					
Heat integration	•	•					

CLIENT DOCUMENT NO.		CONTRACT DESCRIPTION :		DOCUMENT NO.		REV.
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Environmental Aspect	Environmental Impact	Control Measures	Consequence (C1-C5)	Frequency (F1 - F5)	Impact (I1 - I4)	Comments	Actions
Energy recovery from process streams	•	•					
Utilities consumption	•	•					
Other?	•	•					
•	•	•					
WASTE							
Cleaning out of tanks & vessels	• Specify Nature of pollutant, hazard posed, pathway and receptor	•					
Closed drains disposal	•	•					
Spent Chemicals & Reagents	•	•					
Spent Lubricant Disposal	•	•					
By-Products	•	•					
Off-Specification Product	•	•					
Empty Chemicals Drums/ Containers	•	•					
Maintenance, Coke Removal	•	•					
Maintenance – Scale Removal	•	•					
Maintenance - Fouling Removal	•	•					
Maintenance – Strainer/ Filter Cleaning	•	•					
Maintenance – Mill Dust Replacement	•	•					

CLIENT DOCUMENT NO.		CONTRACT DESCRIPTION :				DOCUMENT NO.		REV.
DATE	BY	CHECKED	APPROVED	REVIEWED	ALTERATIONS	Page 5 of 6		REV.

Environmental Aspect	Environmental Impact	Control Measures	Consequence (C1-C5)	Frequency (F1 - F5)	Impact (I1 - I4)	Comments	Actions
Maintenance – Cold Box Insulation	•	•					
Decommissioning	•	•					
Others	•	•					
	•	•					
ACCIDENTS & EMERGENCIES							
Spillage during road tanker loading	•	•					
Storage Tank Overfilling	•	•					
Chemicals spillage	•	•					
Mechanical containment Failure	•	•					
Leakage from buried pipework	•	•					
Fire Fighting Run Off	•	•					
Others	•	•					

CLIENT DOCUMENT NO.		CONTRACT DESCRIPTION :		DOCUMENT NO.		REV.
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CONSEQUENCE

General Category	Standard Descriptions	Severity Ranking
Major Impact	Major Accident To The Environment MATTE Significant/ widespread damage to flora and/ or fauna, e.g. fish killed in significant stretch of river Long lasting pollution Major public health concern, e.g. local evacuation	C5
Considerable Impact	Breach of permit conditions, possible prosecution Significant local damage to flora and/ or fauna Short lived pollution incident Significant public health concern	C4
Significant Impact	Local (on-site) pollution only Specialist clean-up required Minor local public health concern/ nuisance	C3
Limited Impact	Minor local pollution easily cleaned up No lasting pollution No damage to local flora and/ or fauna No public health concern	C2
Negligible Impact	Non reportable release No lasting pollution No damage to local flora and/ or fauna	C1

FREQUENCY

General Category	Standard Description	Ranking
Very High	Continuous/Daily	F5
High	Weekly/Monthly	F4
Moderate	Once a year	F3
Low	Every 1 – 10 years	F2
Negligible	Less than once every 10 years	F1

RISK RANKING

Consequence	Frequency of Occurrence				
	F1	F2	F3	F4	F5
C1	I1	I1	I1	I1	I1
C2	I1	I2	I2	I2	I2
C3	I2	I2	I3	I3	I3
C4	I3	I4	I4	I4	I4
C5	I4	I4	I4	I4	I4

	Impact
I1	No action required
I2	Review and Consider Remedial Action
I3	Corrective Action Advised
I4	Corrective Action Required

IMPACT – Noise**1.0 ASPECT/ACTIVITIES**

List the Activities, which need to be controlled to ensure the impact is minimised

2.0 RESPONSIBILITIES

List who is responsible for ensuring the control measures and consent requirements are implemented.

3.0 CONSENT REQUIREMENTS

List the environmental consents or licences, which are required, i.e. land drainage consent of works within 10m of a watercourse or a Section 61 consent.

4.0 CLIENT REQUIREMENTS

List the site-specific environmental requirements included within the contract and reference the contract documentation.

5.0 GENERAL CONTROL MEASURES

List the general control measures, which should be implemented on site to ensure works are completed and the potential impact is minimised.

6.0 SPECIFIC CONTROL MEASURES

List the specific areas and the specific control measures which are required on site to ensure the impact is minimised, i.e. work next to Wood Lane can only be completed between 10 am and 4 pm.

7.0 MONITORING AND MEASUREMENT

List the site-specific monitoring requirements i.e. daily monitoring of Broadly Brook is to be completed by the Monitoring Engineer and recorded. Chemical samples should be taken monthly etc.

8.0 IN THE EVENT OF AN EMERGENCY

List who should be contacted in the event of an emergency i.e. contact the Site Environmental Manager if works are to overrun, the Site Environmental Manager will contact the Local Authority as required.

9.0 RELATED DOCUMENTS

List the documents which are required to be completed as a part of this Site Environmental Control Plan i.e. Site Water Monitoring Log.

How to Accept and Review Risk Assessments and Method Statements (RAMS)

Summary Process Flow Chart

