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Forth Crossing Bridge Constructors

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Project **FORTH REPLACEMENT CROSSING**

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SURFACE WATER MANAGEMENT PLAN

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SURFACE WATER MANAGEMENT PLAN

CONTENTS

	Page
1 INTRODUCTION	3
2 FCBC POLICY ON SURFACE WATER MANAGEMENT	3
3 KEY RECEPTORS	4
4 POTENTIAL IMPACTS	5
5 MANAGEMENT PROCESS	6
6 GUIDANCE AND GOOD PRACTICE	6
7 LICENCES AND CONSENTS	7
8 ENVIRONMENTAL LIAISON GROUP	9
9 MITIGATION MEASURES	9
10 CONTROL AND MANAGEMENT OF FOUL DRAINAGE	13
11 MATERIALS	13
12 INTERCEPTION OF CONTAMINATED GROUNDWATER	13
13 DISRUPTION TO SERVICES	13
14 MEASURES TO REDUCE FLOOD RISK AND THE IMPACTS OF FLOODING	14
15 WORKING IN AND ADJACENT TO WATERCOURSES	15
16 ST. MARGARET'S MARSH SSSI	15
17 MONITORING	16
18 PROCEDURE FOR DEALING WITH A WATER POLLUTION INCIDENT	17
19 REFERENCES	17
20 FIGURES	18

1 INTRODUCTION

- 1.1.1 This Surface Water Management Plan (SWMP) describes the management process, procedures and controls that are employed to control, mitigate and monitor contamination of surface water during the construction phase. This plan details the monitoring methodology which is used to demonstrate compliance with the commitments to protect the water environment.
- 1.1.2 This SWMP has been produced as part of the Environmental Management Plan (EMP) taking account of the commitments and requirements as detailed in the following documents:
- Forth Crossing Act 2011;
 - Transport Scotland (Dec 2011) Register of Commitments and Undertakings;
 - Transport Scotland (Dec 2010) Code of Construction Practice (CoCP) Rev 5;
 - Transport Scotland (April 2011) Employers Requirements, TS/MTRIPS/WKS/2009/02; and
 - Jacobs Arup (November 2009) Forth Replacement Crossing Environmental Statement (ES).
- 1.1.3 The mitigation commitments relating to potential impacts on the water environment, as a result of construction activities, are given in the ES (Chapter 23, Table 23.3) (Jacobs Arup, 2009).
- 1.1.4 FCBC have appointed an Environmental Manager who acts as the Environmental Clerk of Works (EnvCoW) responsible for implementing the procedures in this plan and supervising the implementation of appropriate environmental safeguards.

2 FCBC POLICY ON SURFACE WATER MANAGEMENT

- 2.1.1 FCBC is committed to implementing good practice to minimise construction phase impacts to surface waters to meet all of the requirements within the contract documents which detail the commitments specified within the ES and the Forth Crossing Act. Works will be designed, executed and monitored to ensure that effects on the water environment, due to construction activities, are no worse than the significant residual effects reported in the ES and, where practical, additional mitigation in line with good practice is implemented.
- 2.1.2 The control and management of activities that could result in impacts on waterbodies form an integral part of the construction process, involving a collaborative approach between the construction team and the Employer's Delivery Team (EDT), to ensure that working methods are adopted to minimise release of pollutants (including sediment) and to avoid or minimise adverse effects on hydrology, flood risk and geomorphology. This is in line with the requirements of the CoCP and any SEPA authorisation and associated conditions issued under the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011.
- 2.1.3 For each process, activity or phase of construction, FCBC produce a method statement. Where there are potential risks to the water environment, the Environmental Manager or suitably qualified delegate reviews the method statement to ensure it incorporates adequate measures for controlling pollution to waterbodies and minimising increases to flood risk or changes in geomorphology. Method statements are reviewed to make sure they comply with the contract and relevant documents including this SWMP, SEPA's Pollution Prevention Guidelines (PPGs), the CoCP and the ES. Method statements are amended and further reviews undertaken until a suitable solution is identified which incorporates the Best Practicable Means (BPM) for controlling impacts on the water environment, as required.

3 KEY RECEPTORS

3.1.1 The watercourses or waterbodies that may be impacted during the construction phase are:

- St. Margaret's Marsh Site of Special Scientific Interest (SSSI);
- Linn Mill Burn;
- Ferry Burn;
- Dolphington Burn; and
- the Firth of Forth.

3.1.2 A full description of each water body is given in Section 9.3 of the ES and their locations are shown in Figures 9.1a and 9.1b of the ES. These figures, produced by Jacobs Arup on behalf of Transport Scotland, are reproduced as Figures 1 and 2 in this SWMP (Section 20).

3.1.3 The bedrock aquifer underlying the site, and within 1km of the project site, is considered to be a water environment receptor, in accordance with SEPA guidance WAT-PS-10-01 (2010). Pollution risks as a result of land contamination, and the process for managing these areas, are set out in the Geology, Groundwater and Land Contamination Management Plan. Detailed plans showing the compounds and of the locations of fuel and concrete storage areas can be found in Figures 3 and 4 (Section 20).

3.1.4 In the ES, St. Margaret's Marsh and the Firth of Forth have been classed as of High sensitivity for water quality. The Firth of Forth is also classified as of High sensitivity for hydrology/flood risk and for coastal geomorphology (refer to Figures 5 and 6 in Section 20).

4 POTENTIAL IMPACTS

4.1.1 The ES identified a number of potential impacts during the construction phase. These can be grouped into:

- hydrology and flood risk;
- fluvial geomorphology; and
- water quality.

4.1.2 In terms of hydrology and flood risk, potential impacts could arise from:

- soil compaction from works traffic;
- alteration of runoff pathways;
- erosion and sedimentation of watercourses;
- dewatering of watercourses; and
- increased flood risk.

4.1.3 The predicted impacts to hydrology and flood risk were found to range from negligible to moderate in significance without mitigation measures in place. The impact of greatest significance was attributed to the temporary alteration of the hydrological regime at St. Margaret's Marsh.

4.1.4 In terms of geomorphology, potential impacts could arise from:

- increased suspended solids; and
- morphological change including scour and erosion of subtidal bed and shoreline, and transport and deposition of suspended sediment within the Firth of Forth. However, these would be of limited spatial and temporal extent and therefore the predicted impacts were found to be of negligible significance.

4.1.5 In terms of water quality, potential impacts could arise from:

- pollution from release of suspended solids;
- accidental spillage or release; and
- mobilisation of pollutants through the creation of pathways from contaminated land.

4.1.6 St. Margaret's Marsh and the Firth of Forth are of high environmental importance and are considered to be of high sensitivity to changes in water quality. Across all waterbodies, the predicted impacts to water quality were found to range from negligible to substantial in significance without mitigation measures in place. The potential release of suspended solids and accidental spillage due to the proximity of construction works and the site compound at St. Margaret's Marsh was considered to be of substantial significance. In addition there is potential for mobilisation of contaminants from St. Margaret's Marsh landfill. The potential release of suspended solids and other pollutants and risk of accidental spillage in the Firth of Forth was considered to be of moderate significance. However, the high dilution and dispersal capacity of the Firth of Forth would reduce the spatial and temporal increase in turbidity and pollutants in the water column.

5 MANAGEMENT PROCESS

- 5.1.1 The roles and responsibilities of management personnel dealing with surface water are listed below. Environmental personnel will be employed on an activity basis as the work programme and monitoring commitments dictate.

Construction Team Site Manager

- Preparation of method statements.
- Implementation of mitigation.
- Review procedure compliance.
- Internal authorisation of SWMP.
- Monitoring compliance with SWMP through site inspections.
- Authority to stop or modify works.

Environmental Manager and Advisors

- SWMP production and review.
- Environment Liaison Group meetings.
- Interface with construction team.
- Authority to stop works in the event of a pollution incident or suspected bad practice in or near the water environment.

- 5.1.2 Method Statements are written by the construction team for works within the vicinity of watercourses and the Firth of Forth detailing construction activities and precautions to protect the water environment. Method statements have also been prepared for service diversions and associated works to protect the water environment.

6 GUIDANCE AND GOOD PRACTICE

- 6.1.1 Design, method statements and work procedures take account of requirements and advice stated within SEPA's Engineering in the Water Environment Good Practice Guide: Temporary Construction Methods (WAT-SG-29), relevant PPGs, and CIRIA publications (including C532, C584, C648, C649, C697 and C698).
- 6.1.2 Where they are not otherwise covered by a SEPA CAR licence, discharges of surface water runoff from construction sites are subject to General Binding Rule (GBR) 10. GBR 10 specifies that the construction site must be drained by a SuDS system or equivalent. CIRIA C697 will be consulted for advice on SuDS.
- 6.1.3 Where possible, FCBC comply with BS 6031 (Code of Practice for Earthworks) with regard to the general control of site drainage, including for example, all washings, dewatering, abstractions and surface water run-off. Where compliance with BS 6031 is not practicable, FCBC will seek agreement of the alternative method from the EDT.

- 6.1.4 FCBC comply with the Water Environment (Oil Storage) (Scotland) Regulations 2006 which apply in relation to storage of any oil-based materials including petrol, diesel, waste and vegetable and plant oil, but excludes uncut bitumen. Above ground fuel and oil storage tanks comply with PPG 2: Above Ground Oil Storage Tanks.

7 LICENCES AND CONSENTS

- 7.1.1 *Discharge consents*- FCBC have obtained the necessary consents for discharge of surface water run-off from the construction site to watercourses, surface water sewers, foul sewers and soakaways, as required. A list of consents is provided in the Area Management Plan. The following consent is currently in place:

- Form H consent for sewage discharge from Ferry Toll compound

- 7.1.2 *Water Environment (Controlled Activities) (Scotland) Regulations 2011* – Most engineering work and construction activities in or near watercourses or waterbodies require authorisation under the terms of CAR. FCBC comply with these regulations. The regulations apply to:

- activities liable to cause pollution of the water environment;
- abstraction of water from bodies of surface water or groundwater;
- the construction, alteration or operation of impounding works in bodies of surface water;
- building, engineering or other works in, or in the vicinity of, anybody of inland surface water;
- activities connected with any of the activities specified above;
- the direct or indirect discharge, and any activity likely to cause a direct or indirect discharge, into groundwater of the substances listed in Schedule 2 to the regulations; and
- any other activity which directly or indirectly has or is likely to have a significant adverse impact on the water environment.

- 7.1.3 CAR does not apply to any activity for which a licence is needed under Part IV of the Marine (Scotland) Act (M(S)A) 2010, available at: <http://www.scotland.gov.uk/Topics/marine/seamanagement/marineact>.

7.1.4 Where required by CAR, FCBC will produce a licence application to SEPA for higher risk engineering activities. CAR licence applications will include detailed information on the following:

- The proposed activity, its design and the reasons for the chosen design, as well as alternatives considered and reasons for rejection. The solution taken forward will be the best practical environmental option, taking into account environmental, engineering, economic, and health and safety considerations.
- Details of the potential impacts to the water environment, including baseline environmental information and relevant environmental assessments.
- Details of the mitigation included in the design, aimed at avoiding, reducing or offsetting the potential impacts.
- A detailed construction methodology for all engineering activities.

7.1.5 Where works are required in or adjacent to watercourses, FCBC will provide further information where appropriate to support the licence application and as agreed with SEPA:

- Measures to protect fish.
- Measures to deal with flowing water appropriately e.g. temporary diversions, over-pumping.
- Measures to reduce the risk of mobilisation of sediments to an acceptable level.
- Measures to protect banks where they are particularly vulnerable to erosion.
- Measures to undertake diversion of flow back into a channel in a manner that reduces the risk of erosion, with temporary bank stabilisation incorporated if necessary.
- Measures to avoid unnecessary in-stream working.
- Measures to comply with SEPA's Good Practice Guide: Temporary Construction Methods (WAT-SG-29).

7.1.6 A CAR licence is in place for road surface discharges for the Main Crossing and the Ferrytoll area on the north side of the Firth of Forth, reference CAR/S/1084203 – this includes the construction of an outfall to the Firth of Forth at NGR NT 1224 8125. A further two CAR licence applications have been obtained (September 2011) for (a) dewatering works associated with the Queensferry Cutting, and (b) drainage of the new road in the Queensferry Junction area. When designing and constructing the outfalls in tidal areas attention has been made to ensure:

- Scour and erosion is minimised through programming works to avoid periods of tidal inundation and through careful design;
- Implementation measures to prevent silt washing into the relevant water body;
- Minimising earthworks within the water body;
- SNH will be consulted about any programme restrictions or any likely noise impacts; and
- Adherence to SEPA's Good Practice Guide – Intakes and Outfalls (WAT-SG-28).

- 7.1.7 FCBC have obtained authorisation under CAR to abstract water from locations on both sides of the estuary associated with dampening down procedures. For the north, abstraction of water from the Firth of Forth at NGR NT 1213 8127 has been authorised, reference CAR/R/1103547. For the south, authorisation has been obtained for the abstraction of up to 50m³/day from Linn Mill Burn (NGR NT 1142 7574), reference CAR/R/1103548.
- 7.1.8 FCBC have also applied to SEPA for registration under CAR for groundwater abstractions and surface water abstractions from the estuary associated with marine works.
- 7.1.9 There are no drinking water abstractions within 1 km of the scheme.
- 7.1.10 Marine (Scotland) Act 2010- There is no legislative requirement for formal consent for the Works under Part IV Marine Licensing of the M(S)A) 2010 as the Forth Crossing Act consents these marine activities (including dredging). In the absence of a consent requirement from M(S)A, FCBC consult and comply with the requirements of Marine Scotland with regards to the construction works and the deposition of solid waste in the marine environment as required.
- 7.1.11 All licences are listed on the Environmental Licences and Consents register FM-ENV-117 which can be accessed via the PMP.

8 ENVIRONMENTAL LIAISON GROUP

- 8.1.1 In addition to direct consultation with SEPA, measures to be implemented to contain and manage surface water run-off from the construction site to prevent deterioration of the water environment and other adverse impacts, may be further discussed with SEPA through the ELG.

9 MITIGATION MEASURES

- 9.1.1 The site layout has been designed to locate potentially contaminated materials and machinery away from watercourses, where reasonably practicable. FCBC also use appropriate methods, such as cut-off ditches and settlement devices, where appropriate, to mitigate impacts on the water environment. Table 1 lists the mitigation measures used by FCBC for the control of silt on site and the triggers for their use. The FCBC Environmental Team provides advice and recommendations regarding water protection, whilst the Construction Team are responsible for the design and execution of required mitigation measures.
- 9.1.2 The control measures set out in this plan will continue to be disseminated to the construction teams in accordance with the CEMP.

9.1.3 The Environmental Team are on site during working hours to carry out inspections in relation to potential water related impacts and maintain a log of relevant observations and any actions taken. These inspections will identify:

- any pollution risks that are unacceptably high;
- spillages and leakages;
- non-compliance with the CoCP; and
- any suspected incidences of pollution.

9.1.4 Many of the potential impacts associated with the construction phase are transient. Chemical spillages or releases of sediment are often short-lived and, coupled with often rapid dispersion in surface waters, periodic water quality sampling may not always identify short-term water quality exceedances on site. Therefore, the Environmental Team make regular visual inspections of the construction site to check for activities and practices causing, or likely to cause, pollution of the water environment. For example, the release of sediment from dewatering discharges. Visual inspections of watercourses close to each construction process or activity are made to check for abnormal conditions such as oily sheens, discolouration, high turbidity and unnatural bank erosion. The frequency of inspections depends on the nature of the work being carried out and its potential to affect sensitive receptors, though the majority of works on the Principle Contract will be away from any watercourses.

Table 1: Silt Mitigation Measures

Mitigation Measure	Trigger	Description
Minimisation: Cut off ditches Pipes	To be used when there is low water flow which is running clear with no evidence of silt. Should not be used in proximity to watercourses.	This measure reduces the amount of water which comes into contact with materials that are likely to cause siltation
Filtration: Straw bales Gravels Silt fencing Baffles Grassed areas	To be used in areas of increased water flow or where run off is increased due to working on a gradient. Also to be used where a ditch or channel may flow into a watercourse.	These filtration measures will be positioned strategically to prevent siltation of watercourses or wet habitats. This will be done in agreement with the EnvCoW.
Silt Settlement: Straw bale settlement lagoons Catchpits	To be used where there is a high potential of silty water entering watercourses	These lagoons will be strategically positioned in locations agreed with the EnvCoW.
Mechanical treatment: Siltbusters (or equivalent)	To be used where the volume and concentration of silty water is high.	This method should be used in conjunction with silt settlement lagoons.
Chemical dosing: Approved flocculants	This should only be used where the above measures have not achieved the desired water quality.	This is a last resort. In advance of using this measure, agreement with SEPA and EDT must be sought, including advice regarding the type of chemical to use.

9.1.5 The frequency of required inspections is given in the method statement for each process or activity, where applicable. When work begins in a new location, or there is a significant change in the nature of the work being undertaken at a location, initial inspections are also be made by a member of the Environmental Team until satisfied that risks to the water environment have been minimised as far as practicable.

9.1.6 FCBC will take appropriate actions where risks are unacceptably high and where there is non-compliance with this SWMP, including stopping works if this decreases the risk. Where actual or suspected pollution incidences are occurring the appropriate Incident Response Plan will be implemented.

- 9.1.7 The impact of the scheme will be reduced through timely implementation of each aspect of the construction works. A programme to facilitate the implementation of mitigation measures at the stage where their application will be most effective has been developed on a locational basis. These will be monitored by the Ecological Clerk of Works and any improvements to the mitigation will be actioned and implemented via Environmental Inspection checklists. Mitigation will be on-going throughout the construction works and will be implemented in timely fashion in each area to ensure its most effective use.
- 9.1.8 Where deemed necessary by the EnvCoW, FCBC will provide construction site drainage systems, sized relative to each work area, which are designed to attenuate and/or treat the anticipated runoff in terms of flow rate, sediment loading and other pollutants. Such systems may include cut-off ditches, drains, detention basins, settlement devices, oil interceptors, temporary treatment ponds and other Sustainable Drainage Systems (SuDS) which are designed to remove pollutants or attenuate flows.
- 9.1.9 FCBC will take into account the CIRIA Report C697 “The SUDS Manual”. All detention basins, swales, trenches and the like will be sized in accordance with CIRIA Report C697 in order to allow settlement for pollution removal purposes. Temporary drainage systems will be designed in accordance with best practice contained within CIRIA C697, C648 and C649. If flocculants are considered necessary to aid settlement of fine suspended solids such as clay particles, the chemicals used will first be approved by SEPA. Table 1 describes a number of different methods for treating silt-laden water and their application.
- 9.1.10 With regard to fuel and oil storage, FCBC comply with the regulations set out in paragraph 6.1.4. PPG 2 (Above Ground Oil Storage Tanks) sets out requirements including those relating to positioning, specification, capacity, secondary containment and ancillary equipment for storage tanks.
- 9.1.11 Where applicable, FCBC comply with PPG 26 (Storage and Handling of Drums and Intermediate Bulk Containers) in relation to chemical storage, handling and use.
- 9.1.12 Stationary plant used by FCBC are fitted with measures such as drip trays to retain any leakage of oil or fuel. FCBC empty trays at regular intervals to prevent overflow.
- 9.1.13 Spillage kits are stored at key locations on site as set out in the Incident Response Plan and in particular at refuelling areas. Where possible, spillage kits are also kept with mobile bowsers.
- 9.1.14 FCBC have consulted with the relevant local authorities and SEPA regarding specific requirements in relation to establishing and operating a concrete material batching plant located on site. All wash water is recycled through the batching plant and not discharged to the water environment. A PPC Permit has been obtained for the concrete batching plant as required by the Pollution Prevention and Control (Scotland) Regulations 2000.

9.1.15 Where FCBC propose to use herbicides and other potentially polluting chemicals in proximity to watercourses, FCBC consult and comply with the requirements of SEPA.

10 CONTROL AND MANAGEMENT OF FOUL DRAINAGE

10.1.1 FCBC manage and dispose of foul water and sewage effluent from site facilities in compliance with PPG 4 (Treatment and Disposal of Sewage where no foul sewer is available). The following measures are also taken:

- Containment of foul water and sewage effluent using temporary foul drainage facilities and subsequent disposal off-site by a licensed contractor. Currently there are several portable toilets at locations around the site.
- Connection to the local foul water and sewerage system as agreed with the relevant authorities (main compound at Ferrytoll).
- Where a foul sewer is not present, nor is containment and off-site disposal practical, sewage and foul water will be treated and discharged to a watercourse or soakaway. This is currently the case at Echline Compound where a soakaway is used. For any foul drainage discharge proposed outwith the public sewer, discharge will not commence without prior authorisation from SEPA.

11 MATERIALS

11.1.1 Materials for use in fill are to be assessed and agreed with SEPA to ensure there is no risk to the water environment.

12 INTERCEPTION OF CONTAMINATED GROUNDWATER

12.1.1 Contaminated land risk assessments are detailed in the Geology, Groundwater and Land Contamination Management Plan.

13 DISRUPTION TO SERVICES

13.1.1 Service diversions, protection of utilities, excavations and ground penetration works are carried out according to best practice. Potential services are identified using information from the service provider and through survey where necessary. Measures will be taken to prevent damage to services and to avoid pollution during service diversions, excavation and ground penetration on a case by case basis, which will be reported in the method statements for the works.

13.1.2 Field drains will be repaired as part of the commitments for land reinstatement post-construction, which is discussed in the Agricultural Management Plan.

14 MEASURES TO REDUCE FLOOD RISK AND THE IMPACTS OF FLOODING

14.1.1 Construction activities are undertaken in order to minimise increases in flood risk, such as:

- adoption of SuDS to attenuate runoff rates;
- minimising the period of exposure of bare areas;
- limiting uncontrolled runoff from newly paved areas; and
- avoiding the obstruction of surface runoff pathways.

14.1.2 Plant and material including stationary oil storage tanks are stored in safe areas above the 0.5% Annual Exceedance Probability (AEP) (1 in 200 year return period) rainfall event.

14.1.3 Temporary construction works will aim to be resistant to flood impacts in order to prevent movement or damage during potential flooding events. During high rainfall events, FCBC will endeavour to remove plant, equipment and mobile materials from watercourses and floodplains at risk of flooding, where practicable, and provided there is no immediate risk to human health or safety.

14.1.4 FCBC will consult with SEPA and make appropriate use of SEPA's Floodline Flood Watch service for works within river and tidal areas.

14.1.5 FCBC have implemented an emergency response plan for flood events. The aim of the plan is to provide a framework for the response to rainfall events in areas near the scheme. The emergency plan, to be carried out by a member of the operations teams as follows:

- 1 Daily check of weather forecast
- 2 Daily check of online floodline alerts from SEPA (<http://floodline.sepa.org.uk/floodupdates/info/group-id/4830>)
- 3 If an alert exists, establish communication with specified Engineers who will then disseminate the information to staff and operatives, as required to ensure that pumps are working and switched on.

14.1.6 A plan has been created to deal with intensive rainfall in the Queensferry area and reduce the risk of flooding. Figure 7 details the temporary mitigation measures including the locations of pumps to be used during heavy rainfall. The risk of flooding elsewhere on the scheme is considered minimal and mitigation measures will be developed as required during the construction phase. Daily weather forecasts are provided to the Networks' teams from the Marine team. Should heavy rainfall be predicted, the Works Manager shall ensure that the pumps are mobilised and working efficiently throughout the rainfall period.

15 WORKING IN AND ADJACENT TO WATERCOURSES

- 15.1.1 Chemical, fuel and oil tanks and refuelling locations are located more than 10m from watercourses. Concrete mixing and washing areas are also located more than 10m from watercourses.
- 15.1.2 FCBC will take particular care during execution and completion of the Works over or adjacent to watercourses, channel habitats and local drainage systems to ensure minimal disturbance to the banks and beds of watercourses, waterbodies, wetlands, and existing land drainage systems. This will include the use of best practice during the construction of SuDS, culverts, watercourse crossings and watercourse diversions.
- 15.1.3 In order to reduce the risk of localised scour and erosion, outfall structures will not be constructed during periods of high flow (as determined by the Environmental Advisor).
- 15.1.4 Construction of outfalls in tidal areas will be appropriately programmed and will include appropriate erosion protection measures around the works to reduce the risk of scour and erosion during high tides.
- 15.1.5 Where practicable, sediment fences are provided to prevent sediment being washed into watercourses.
- 15.1.6 Excavating into watercourses will be avoided and the extent of disturbance and in-channel working limited as far as reasonably practicable.
- 15.1.7 Detailed methodologies relating to construction works within the Firth of Forth are included in method statements. Information on concrete control is included in the Incident Response Plan.

16 ST. MARGARET'S MARSH SSSI

- 16.1.1 St. Margaret's Marsh SSSI is a particularly sensitive receptor and, as with all watercourses, chemical, fuel and oil tanks and refuelling locations are located more than 10m beyond its boundary. Concrete mixing and washing areas are also located more than 10m beyond the boundary of this designated SSSI.
- 16.1.2 During construction (and subsequent operation) the hydrological connectivity of the marsh and the directional flow of groundwater will be maintained through appropriate design.
- 16.1.3 Further details of the monitoring at St. Margaret's Marsh SSSI can be found in the Geology, Groundwater and Land Contamination Management Plan.

17 MONITORING

17.1 A) Construction Phase Monitoring

17.1.1 Visual monitoring of water discharges at the Queensferry Cutting and various temporary discharges around site are on-going during the construction period in order to:

- alert FCBC to any detrimental effects that particular construction activities may be having on water quality in order that appropriate remedial action can be taken as quickly as possible;
- provide evidence that management procedures on site (for example sediment run-off control) are working correctly; and
- ensure compliance with the CAR license associated with the Queensferry Cutting (combined groundwater and surface water discharge).

17.1.2 FCBC will continue to consult with SEPA regarding the water quality monitoring to be undertaken for watercourses (i.e. Linn Mill Burn) that are affected by construction works or discharge of surface water run-off.

17.1.3 Water quality testing will be carried out on the Queensferry Cutting discharge to Linn Mill Burn on a monthly basis or on an ad-hoc basis if any dis-colouration of the discharge is noted during visual monitoring. The intercepted groundwater will be directed to the SUDS basins at Echline for attenuation and treatment prior to discharging to Linn Mill Burn. The water quality testing will then be undertaken at the outfall point from the SUDs basins to Linn Mill Burn (National Grid Reference: NT 1144 7873).

17.1.4 Visual checks on discharges will be undertaken as a minimum on a weekly basis as part of site inspections by the Environmental Team. This involves checks to ensure siltation and turbidity is not being caused by construction activities. When activities are occurring in or adjacent to watercourses, process specific monitoring requirements will be developed within the method statement. Monitoring will be undertaken at the point of the activity, as well as up and downstream.

17.1.5 The approach to groundwater monitoring is set out in the Geology, Groundwater and Land Contamination Management Plan. The Environmental Advisor is responsible for on-going groundwater monitoring.

17.1.6 The results of any water quality and groundwater level monitoring are updated, interpreted and made available within one week of each collection. Any water quality monitoring will be submitted to the EDT and discussed at Weekly Environmental meetings between the EDT and FCBC.

18 PROCEDURE FOR DEALING WITH A WATER POLLUTION INCIDENT

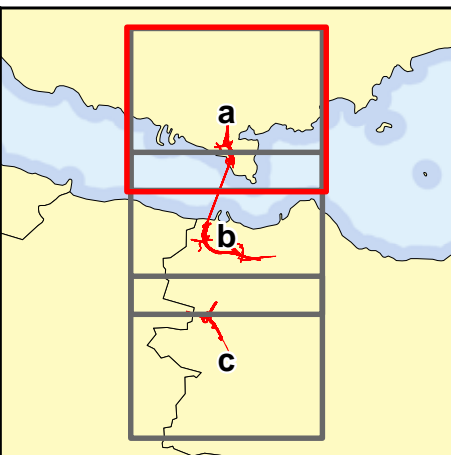
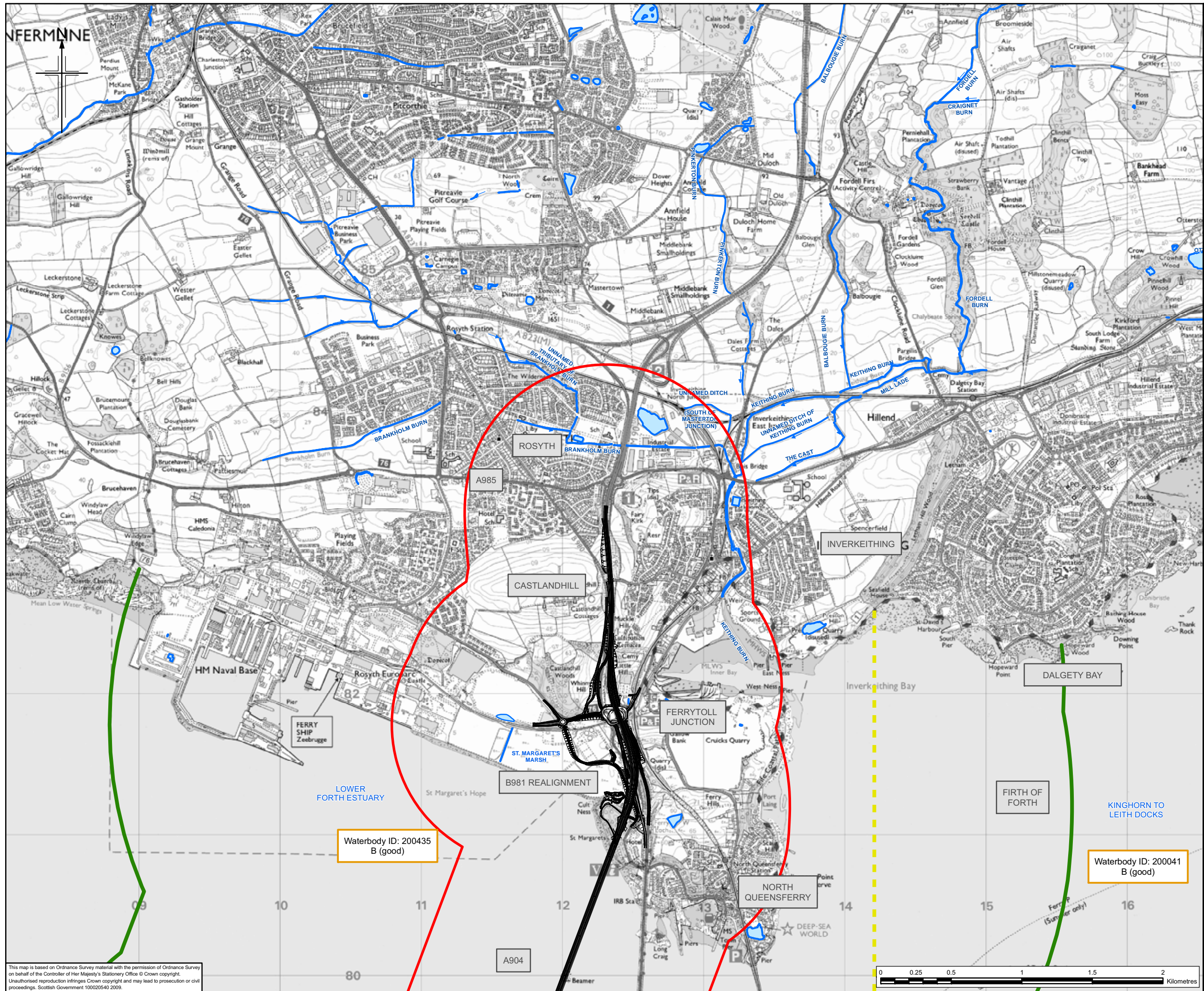
18.1.1 Where a pollution incident is identified, the management actions in the Land Based Incident Response Plan and Marine Spillage Plan will be followed.

19 REFERENCES

- BS 6031:2009- Code of Practice for Earthworks
- CIRIA (2001) C532- Control of water pollution from construction sites
- CIRIA (2003), C584- Coastal and marine environmental site guide
- CIRIA (2006), C648- Control of water pollution from linear construction projects
- CIRIA (2006), C649- Control of water pollution from linear construction projects. Site guide
- CIRIA (2007), C698- Site handbook for the construction of SUDS
- CIRIA (2007), C697- The SUDS Manual
- Forth Crossing Act (2011)
- Jacobs Arup (Nov 2009), Forth Replacement Crossing DMRB Environmental Statement
- Marine (Scotland) Act 2010
- Pollution Prevention Guidelines: 2 Above Ground Oil Storage Tanks
- Pollution Prevention Guidelines: 4: Treatment and Disposal of Sewage Where no Foul Sewer is Available
- Pollution Prevention Guidelines: 6: Working at construction and demolition sites
- Pollution Prevention Guidelines 26: Storage and Handling of Drums and Intermediate Containers (IBCs)
- SEPA (2006), Underground Storage Tanks for Liquid Hydrocarbons: Code of Practice for Installers, Owners and Operators of Underground Storage Tanks (and Pipelines). Water Environment (Controlled Activities) (Scotland) Regulations 2005. Version 1: May 2006.
- SEPA (2009), Engineering in the Water Environment Good Practice Guide: Temporary Construction Methods, Document reference: WAT-SG-29. First Edition, March 2009
- SEPA (2010) Water Use: Assigning groundwater assessment criteria for pollutant inputs, Guidance WAT-PS-10-01. Version 1.
- Transport Scotland (Dec 2010), Code of Construction Practice, Rev 5
- Transport Scotland (April 2011), Employers Requirements, TS/MTRIPS/WKS/2009/02
- Transport Scotland (Dec 2011), Register of Commitments and Undertakings
- Water Environment (Controlled Activities) (Scotland) Regulations 2011
- Water Environment (Oil Storage) (Scotland) Regulations 2006
- Waste Management Licensing (Scotland) Regulations 2011

20 FIGURES:

Figure 1 - Water Features to the north of the Firth of Forth (reproduced from Jacobs Arup Environmental Statement Figure 9.1a)



- Legend**
- Proposed scheme (Stage 3 design)
 - Water flow direction
 - Watercourses
 - Waterbodies
 - 1km study area
 - 3km study area
 - SEPA division between estuarine and coastal waterbody
- SEPA Classifications**
- SEPA river water quality classification
 - SEPA waterbody ID and coastal/estuarine water quality classification

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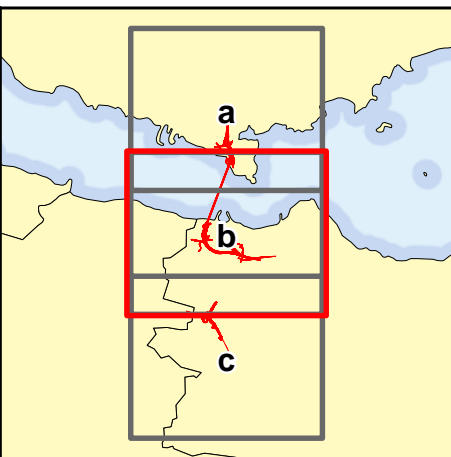
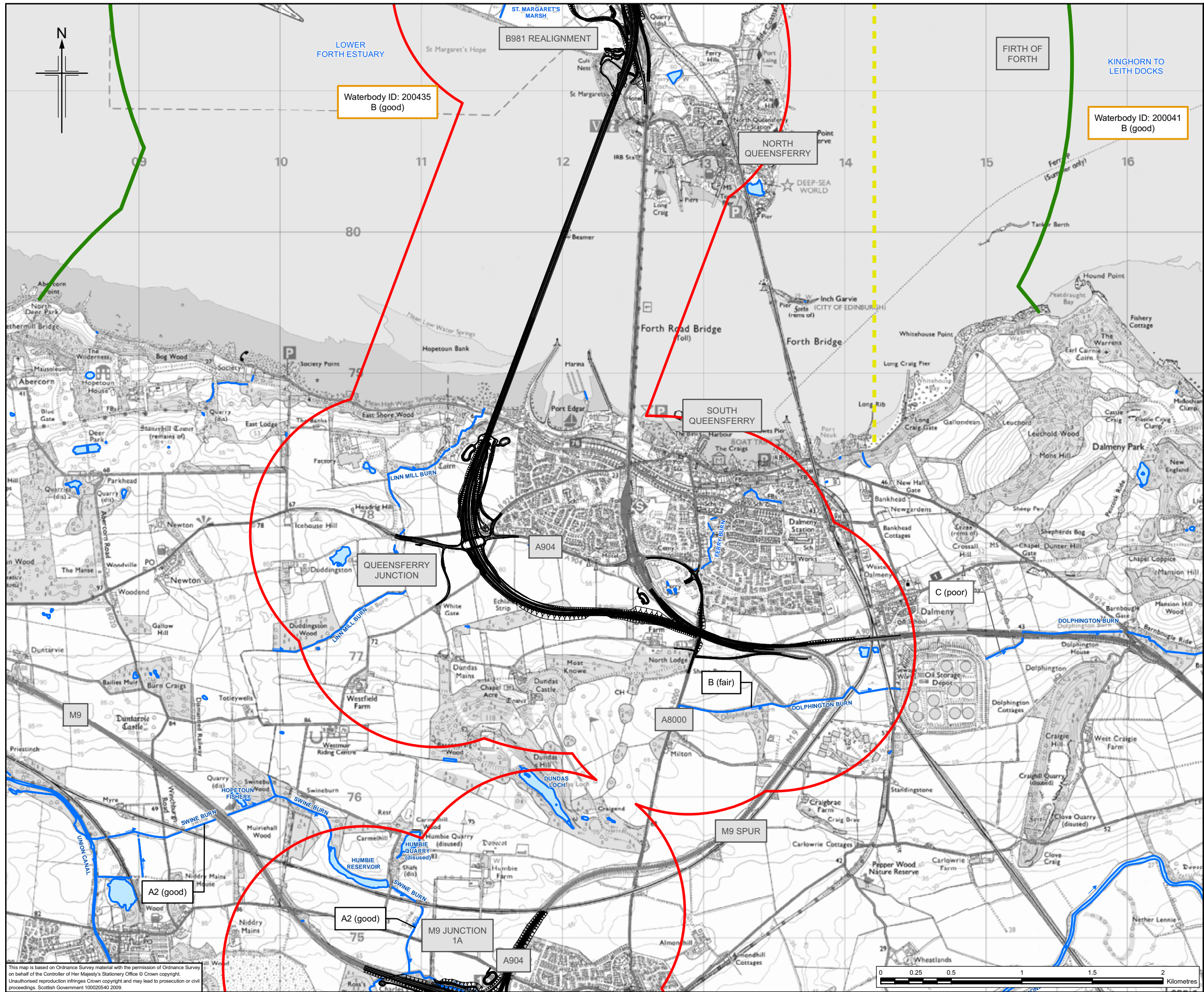
Project
FORTH REPLACEMENT CROSSING Environmental Statement

Drawing title
Water Features

Drawing Status	FINAL	
Scale	1:25,000 @ A3	DO NOT SCALE
Client no.	RD001675	
Drawing number	FIGURE 9.1a	Rev 0

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Figure 2 - Water Features to the south of the Firth of Forth (reproduced from Jacobs Arup Environmental Statement Figure 9.1b)



Legend

- Proposed scheme (Stage 3 design)
- Water flow direction
- Watercourses
- Waterbodies
- 1km study area
- 3km study area
- SEPA division between estuarine and coastal waterbody

SEPA Classifications

- SEPA river water quality classification
- SEPA waterbody ID and coastal/estuarine water quality classification

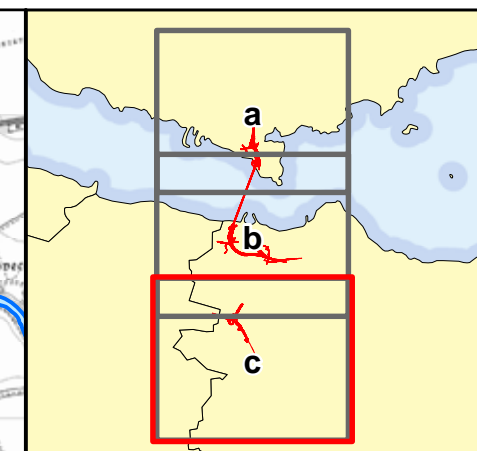
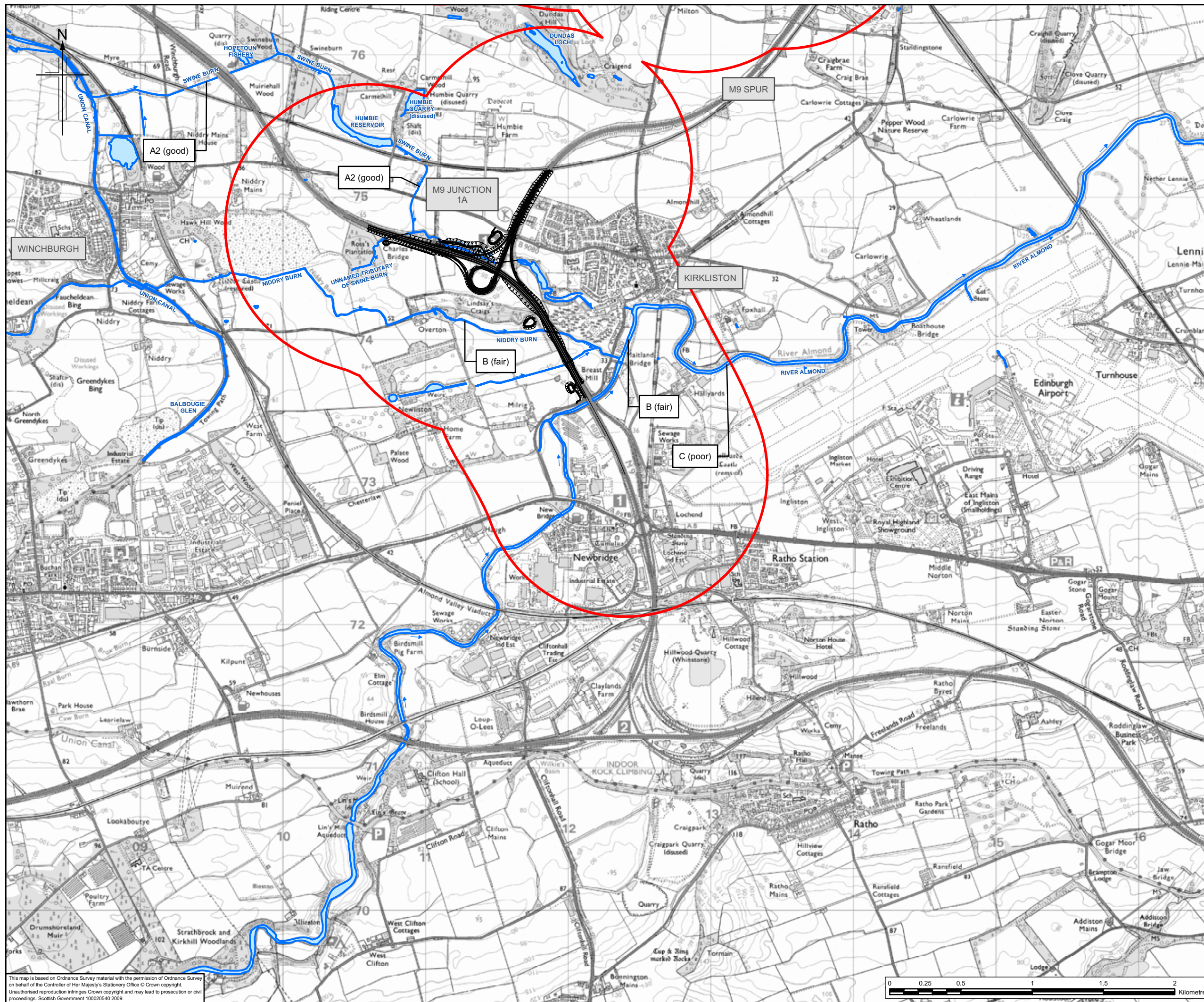


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 Project: **FORTH REPLACEMENT CROSSING**
 Environmental Statement

Drawing title		
Water Features		
Drawing Status: FINAL		
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Drawing number:	FIGURE 9.1b	
		Rev 0

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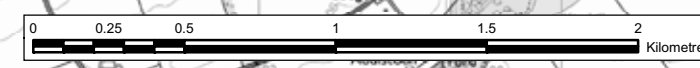
Legend

- Proposed scheme (Stage 3 design)
- Water flow direction
- Watercourses
- Waterbodies
- 1km study area
- 3km study area
- SEPA division between estuarine and coastal waterbody

SEPA Classifications

- C (poor) SEPA river water quality classification
- Waterbody ID: 123456 C (poor) SEPA waterbody ID and coastal/estuarine water quality classification

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Drawing title
Water Features

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Client no. RD001675

Drawing number **FIGURE 9.1c** Rev 0

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Figure 3 – Detailed plan of Southern Compound, including location of fuel storage areas

Redacted for web version

Figure 4 – Detailed plan of the marine works areas, including locations of fuel and concrete storage areas

Redacted for web version

Figure 5 - Indicative Flood risk to the south of the Firth of Forth (the green area identifies land at risk of flooding from the sea)



Figure 6 - Indicative Flood risk to the north of the Firth of Forth (the green area identifies land at risk of flooding from the sea)

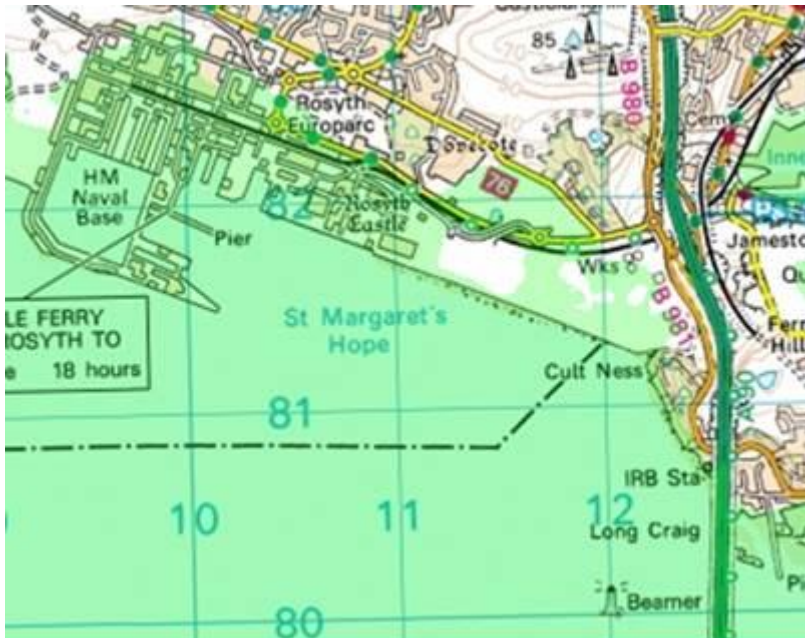


Figure 7 - Temporary flood mitigation measures, showing pumps (red dot); pumping direction (blue dotted line); and excavations/catchment pits (grey areas).

