



Carbon Transition and Infrastructure Renewal



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Introduction

Aquatera was established in 2000 to provide a modern and innovative suite of environmental services and products. The company delivers to local, UK and worldwide markets and has established a strong track record in the renewable energy and other energy sectors. This work includes preparation of strategic environmental assessment (SEA) and environmental impact assessment (EIA) documents for renewable energy projects and strategies, as well as resource assessment studies, risk assessments, design advice, operations support, environmental survey, developing visualisation tools and producing information and awareness materials. Aquatera also organised the highly successful Renewable Realities conferences and exhibitions in 2002 and 2003.

In addition to experience in renewable energy, Aquatera and its associates have a vast knowledge of wider environmental and social studies, particularly in offshore and coastal areas. The team has completed numerous research projects, including a number funded by the UK Department of Trade and Industry (DTI) and other government bodies, and are expert practitioners in their various fields. Aquatera's support IT, multimedia and graphic design specialists are also leaders in their respective fields.

The ability for Aquatera to organise and deliver has been recognised by its clients and the wider business community, notably via the 2001 BP Helios Awards and the 2002 Highlands and Islands Enterprise Business of the Year Awards. Aquatera received a Highlands and Islands Small Business of the Year Commendation in 2003, and a Scottish Planning Awards Commendation in 2007 for its part in developing The Highland Council's renewable energy strategy. Also, in 2008, Aquatera was invited to participate in an Entrepreneurship and Innovation Scholarship at the Massachusetts Institute of Technology (MIT) Sloan Business School.

Aquatera has a passion for renewable energy development. However, this is not the only area the company has a keen interest in. With nearly 20 years of professional support to the oil and gas industry, Aquatera also has in-depth knowledge of the current major energy supply chain based upon hydrocarbons. The company has experience across the world – from seismic surveys to field abandonment plans, and from operations in the deep sea to desert environments. Aquatera therefore has a wealth of understanding about how the oil and gas industry works, and has ideas about how it can adapt to a world about to embark upon the carbon transition process.

This brochure summarises as case studies a selection of carbon transition and infrastructure renewal projects that Aquatera has conducted.

LPG Fuel Availability Study

Orkney Enterprise, 2002



LPG tanks at the Stromness service station in Orkney

In this study, Aquatera examined the potential for enhanced supply and use of liquefied petroleum gas (LPG) as a fuel within Orkney. The study was triggered by the apparent lack of utilisation of the fuel source compared to other regions, including other island groups.

The study determined that there were pathways by which LPG could be brought to Orkney and indeed there was already a significant market for LPG as a heating fuel.

Environmental and Risk Assessments plus Contingency Planning for STS Transfer of Oil

Melbourne Marine Services Ltd, 2005-6



Ship-to-ship transfer in operation

As the mature oil fields of the world start to decline in production, new oil trading routes will become established. This is already happening around the UK, as existing supplies of oil delivered by pipeline from the North Sea oil fields are declining. New oil production, from Russia in particular, is increasing. Consequently, the transport of oil around the UK is moving once again from pipelines to tankers – a situation that previously existed in the 1960s.

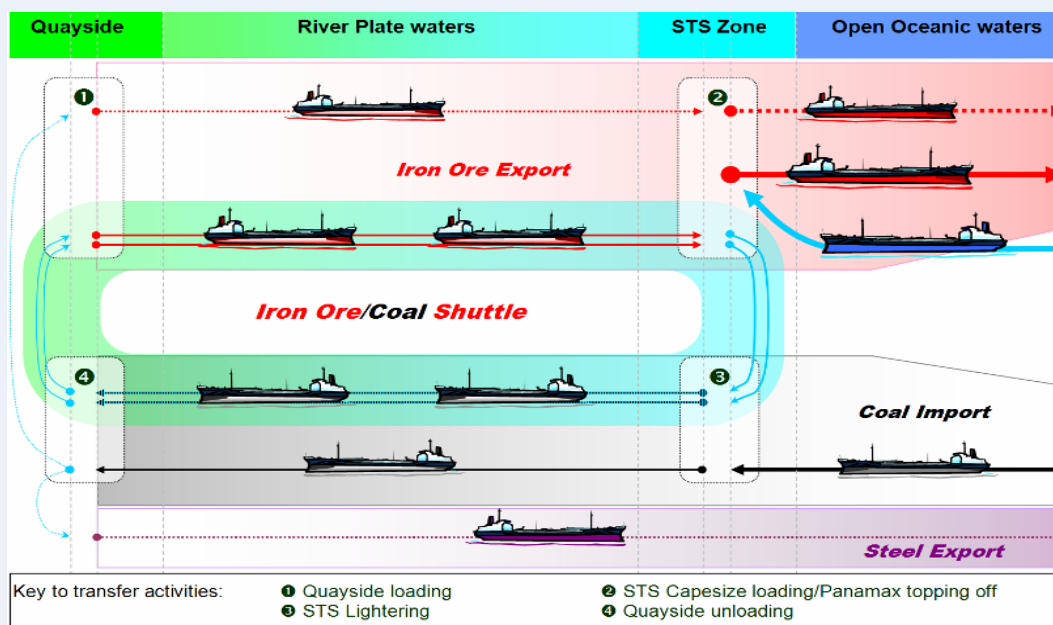
This change in oil trading and transport will have knock-on effects for much of the UK's oil distribution and petrochemicals industry. The question will increasingly arise as to how facilities like Grangemouth will get their oil feedstock.

Ship-to-ship (STS) transfers of oil are a possible link in the supply chain that, although it occurs regularly around the world, has usually been undertaken offshore in UK waters. The Maritime and Coastguard Agency (MCA) is, however, keen to see such activity moved into controlled port areas, where more appropriate controls can be applied. The difficulty is that many of the UK's major ports, including its oil ports, lie in estuaries with significant wildlife conservation interests.

Aquatera worked on a proposed STS transfer project in the Firth of Forth. The proposal has attracted some opposition locally, but STS operations seem likely to be an increasingly important tool in the distribution of oil around the world. The key consideration was: can STS be done safely? Aquatera worked alongside the project proponents and the local port authority Forth Ports to ensure that as far as practical all the possible impacts were recognized and suitable mitigation and contingency measures were incorporated in proposals.

Preliminary EA for STS Transfers of Iron Ore and Coal near the River Plate

Rio Tinto Brazil, 2007



Schematic representation of cargo vessel activities associated with the proposed River Plate ship-to-ship transfer operations

Rio Tinto Brazil (RTB) is evaluating a ship-to-ship (STS) transfer operation of iron ore and coal at designated STS zones on the south-east coast of Uruguay. The operation will also include the associated shipping activities which will supply the STS operation. This comprises feeder vessels leaving the quayside, transiting River Plate and coastal waters whilst shuttling to and from an inland terminal some 300 km to the west, and vessel approach and manoeuvring within the STS Zone. RTB wishes to undertake voluntary environmental assessment (EA) studies to identify potential key impacts and as part of the overall assessment of the viability of this proposal.

Aquatera was appointed by RTB to lead and manage the project which has involved strong collaboration with local environmental company, GEA Consultores in Uruguay. The five main stages for this project were:

- Project definition and description
- Scoping document production
- Data gathering (baseline studies and existing information)
- Screening of interactions
- Preparation of a preliminary assessment report

The final production of a preliminary EA report allowed RTB to make an early business decision based on focused environmental information, and also provided a scope of work for subsequent detailed assessment, management and mitigation of the potential environmental interactions of the proposal.

Scoping Report for a Container Hub on Hoy, Orkney

Orkney Islands Council, 2007



Main line container vessel example – Emma Maersk (14,500 TEU geometric)

The growing global trade in container traffic provides an opportunity for a major transshipment hub to be located in Orkney. The Islands lie at the entry point to many European and Russian trade routes from North America, and from more southerly trade routes, making it a very strategic location. It also has a considerable amount of development space available and good water depths. These factors make Orkney a prime location for a container hub development.

Over the last few years, Orkney Islands Council (OIC) has undertaken a number of investigations into the concept of an Orkney Container Hub. Lyness on Hoy has emerged as the favoured site for the development.

An initial evaluation of options for the development provided a project description. Based on this, Aquatera, in collaboration with Xodus Aurora, carried out a scoping study to produce a scoping consultation document and final scoping report.

The scoping consultation document was produced to firstly provide the OIC, regulators and advisors with an overview of the Orkney Container Hub project by providing the most recent information on the project in a concise and manageable format. Secondly, the document aimed to provide an initial appraisal of the scale and nature of potential effects of the project on the receiving environment, to provide advice on information gaps and the further studies that will be required to fill them, and to give recommendations for the scope of the environmental impact assessment (EIA) process that would need to be carried out to fully assess the proposal.

The scoping report included the following criteria:

- Definition of the geographical area of interest
- Scope of operations (defining start and end points for the assessment)
- Description of activities
- Key environmental sensitivities in the area
- Identification of possible interactions and impact themes
- Methodology and scope of the EIA

Agip Kashagan Preliminary EIA

AGIP KCO, 2002

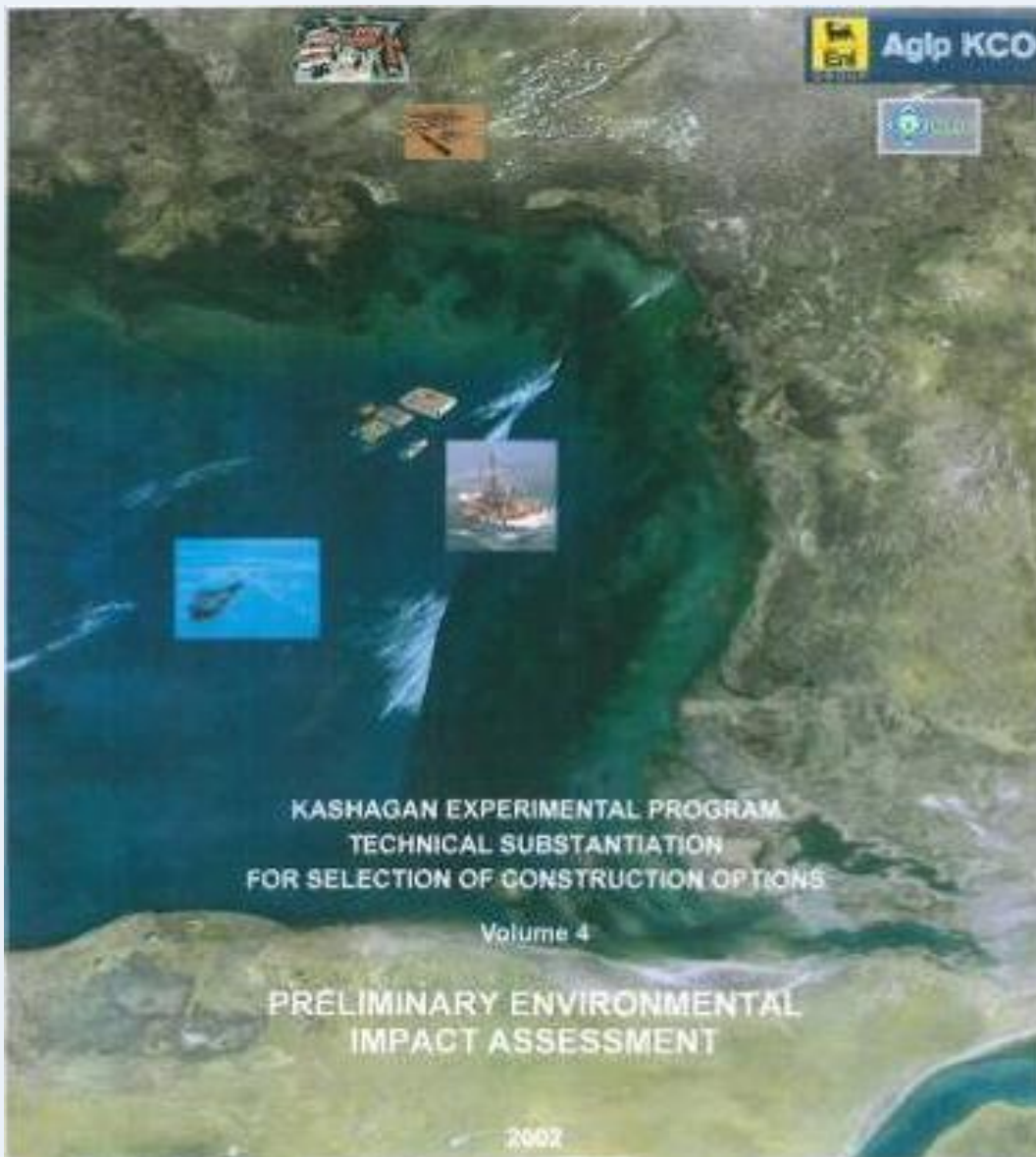


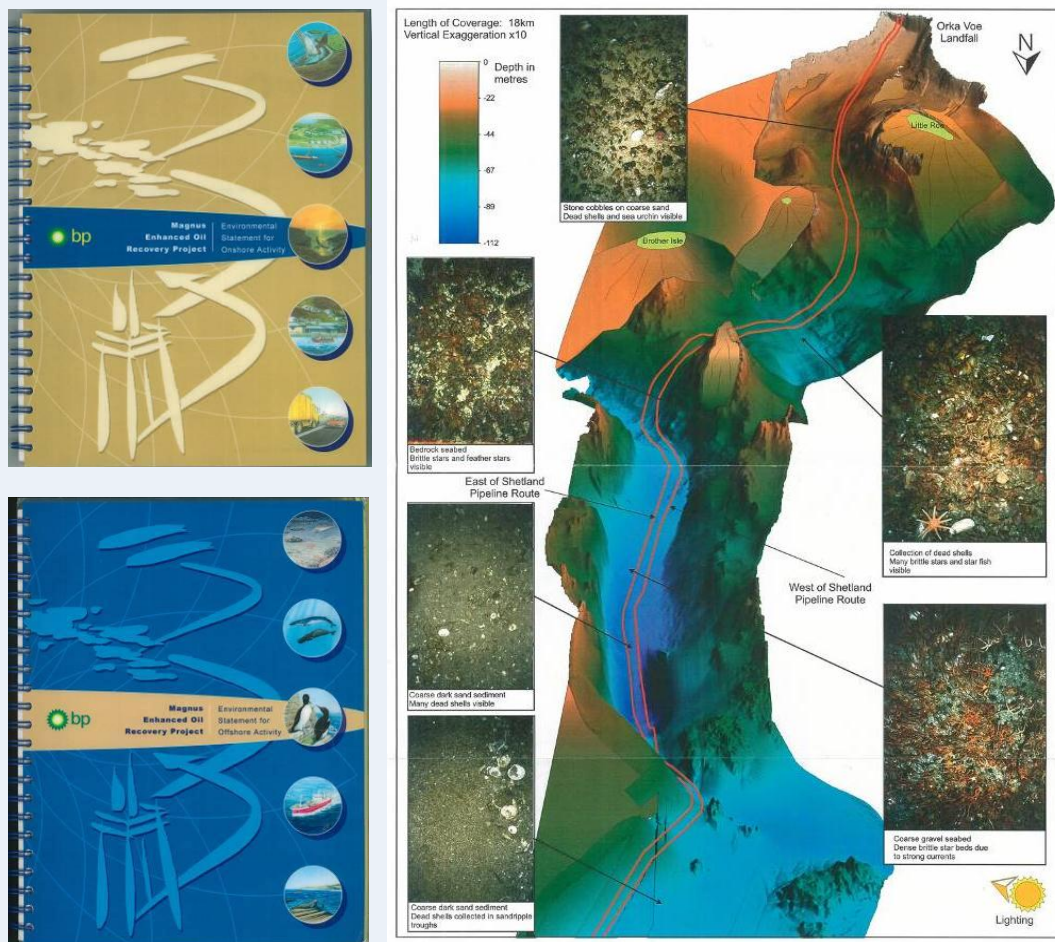
Illustration of marine environmental data collated for the preliminary EIA

Within the environmental regulatory framework of the Republic of Kazakhstan there is a requirement to complete a preliminary environmental impact assessment (EIA) for large industrial projects.

This preliminary EIA for the Kashagan field was completed by a local Kazakh contractor under the supervision and guidance of Dr Gareth Davies from Aquatera. This role involved working alongside the contractor over a nine-month period and attending a number of meetings with regulators and senior management for the project. It also involved a large amount of strategic planning in order to match regulatory and project requirements.

Magnus EOR Project

BP, 2000



Off- and On-shore Environmental Statements and Survey Work

Aquatera completed its work for the Magnus Enhanced Oil Recovery (EOR) Project to particularly tight time constraints and high levels of scrutiny, due to the project's strategic importance to BP. The environmental impact assessment (EIA) documents were written to the highest standards and incorporated appropriate assessments due to the presence in the vicinity of candidate special areas of conservation (SACs) and Annex 1 species listed in European wildlife directives.

The documents themselves were particularly well received by the regulators for the clarity with which they dealt with issues and the lack of spurious information, which is often used to "bulk up" such studies.

Aquatera's overall environmental programme for the Magnus EOR project was recognised in BP's Helios awards where it received special commendation.

Re-use and Disposal of Cuttings from Drilling Operations off Sakhalin Island

Elvary Neftigas, 2007



Sampling of cuttings waste

Substantial quantities of drill cuttings waste are generated during the drilling of offshore exploration and production wells. In the past this waste has been discharged in situ. However, in recent times, legislation has severely restricted this route of disposal and the majority of waste generated during drilling operations now tends to be shipped to shore for treatment and disposal.

Elvary Neftigas, an international consortium of oil companies, was responsible for drilling a number of exploration wells in the sea off Sakhalin Island. The waste from preliminary drilling activities was initially treated and then disposed of as landfill. The aim of this project was to assess whether the drilling waste would be a suitable raw material to be used in the manufacture of concrete building materials.

Aquatera, supported by a local partner company, REA Consulting, carried out a number of tasks ranging from the identification of the potential uses of the waste, reviewing the applicable legislation, assessing local processing and testing facilities, and organising sampling and testing of the drilling waste material.

Unfortunately, the quantities of hydrocarbon reserves discovered were lower than expected and the drilling programme was terminated early. As a result this study was not fully completed. However, the initial study indicated that there was significant engineering and demand potential for the re-use of the drilling waste in the manufacture of concrete products. Moreover, the test results also indicated that some of the constituents present in the waste exceeded threshold values set out in the applicable legislation and that further studies would need to be undertaken to determine the significance of the findings.



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