

Tidal Lagoon Swansea Bay

Adaptive Environmental Management Plan

DCO Requirement 6

WORKS 7A

June 2020

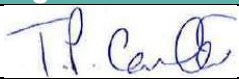
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Name	Signature	Date
Tim Carter		31/01/20

Abbreviations

AEMP	Adaptive Environment Management Plan
AMR	Annual Monitoring Report
ASR	Annual Summary Report
CCSC	City and County of Swansea Council
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CEMP	Construction Environment Management Plan
CRG	Core Review Group
DCO	Development Consent Order
EC	European Commission
EIA	Environment Impact Assessment
ES	Environmental Statement
INNS	Invasive Non-Native Species
LG	Liaison Group
LPA	Local Planning Authority
MAS	Monitoring Action Sheet
ML	Marine Licence
MS	Method Statement
MW	Megawatts
NPS	National Policy Statement
NPTCBC	Neath Port Talbot County Borough Council
NRW	Natural Resource Wales
NRW (A)	Natural Resources Wales Advisory
NRW (PS)	Natural Resources Wales Permitting Services
NSIP	Nationally Significant Infrastructure Project
OEMP	Operational Environmental Management Plan
PINS	Planning Inspectorate
RBMP	River Basin Management Plan
SINC	Site of Importance for Nature Conservation
SMRU	Sea Mammal Research Unit
SoS	Secretary of State
SSSI	Site of Special Scientific Interest
TLSB	Tidal Lagoon Swansea Bay
TRG	Topic Review Group
WFD	Water Framework Directive
WFS	Water Framework Strategy

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1 Introduction

1.1 The TLSB project

- 1.1.1 Tidal Lagoon Swansea Bay (TLSB) will be the world's first purpose built tidal energy lagoon. The generating station will have an installed capacity of 320 megawatts (MW) and will enclose part of Swansea Bay, from the eastern side of the River Tawe to the eastern edge of the new Swansea University Bay-Campus. In total the seawall will form an approximately 9.5km-long, U-shape which will encompass approximately 11.5km² of the seabed, foreshore and intertidal area of Swansea Bay.
- 1.1.2 TLSB made an application to the Planning Inspectorate on 7 February 2014 for a Development Consent Order (DCO) for a tidal lagoon (the TLSB Project) in Swansea Bay, South Wales. Examination of the application closed on 10 December 2014 and development consent was granted by the Secretary of State (SoS) on 9 June 2015.

1.2 DCO Requirement

- 1.2.1 Agreement of an Adaptive Environmental Management Plan (AEMP) is Requirement 6 of the DCO, and as such has been prepared by TLSB for approval by the relevant Planning Authorities in accordance with the DCO.

- 1.2.2 DCO Requirement 6 – Adaptive Environmental Management Plan states:

6.—(1) No authorised development are to commence until an AEMP, substantially in accordance with the outline Adaptive Environmental Management Plan, has been submitted to and approved by the relevant planning authorities in consultation with Natural Resources Wales.

(2) The approved AEMP must contain provision for the revision from time to time of the monitoring and management measures that it contains in order to achieve the Objectives set out in the outline Adaptive Environmental Management Plan.

(3) Construction and operation of the authorised development must be carried out in accordance with the approved AEMP as it subsists from time to time.

(4) The undertaker is to be responsible for the implementation of measures contained in or determined pursuant to the AEMP.

(5) The AEMP must include mechanisms for the delivery of mitigation to manage restoratively any adverse impacts resulting from the development, to habitats, species and sediment distributions on the Swansea Bay seafront arising from—

- (a) increases in mud deposition within the lagoon;*
- (b) increases in windblown sand hazards; and*
- (c) increases in saltmarsh vegetation.*

(6) The AEMP must include a scheme for the monitoring and management of siltation in the Monkstone Marina.

(7) The AEMP must provide for the appointment of a Core Review Group to include representatives of the undertaker, Natural Resources Wales and the 2 relevant planning authorities and to be chaired by an independent person selected by the Core Review Group.

- 1.2.3 The AEMP has been drafted to satisfy DCO Requirement 6 for Works 7a and therefore includes elements that are relevant to the City and County of Swansea Council (CCSC), therefore, this AEMP is provided to CCSC only, for approval.
- 1.2.4 The AEMP has been produced to satisfy the criteria of DCO Requirement 6 in accordance with the Construction Phasing Scheme (DCO Requirement 3) and as set out in Section 2.2 of this document. This document will be updated, as appropriate, at the relevant phases of construction to include details relevant to that phase of DCO Works.

1.3 ML Conditions

- 1.3.1 An application for a Marine Licence (ML) for the TLSB Project was made to Natural Resources Wales (NRW) Permitting Services (PS) in February 2014. Consultation is ongoing and determination of the ML is awaited by NRW (PS) as the Licensing Authority.
- 1.3.2 Should a ML be granted for the TLSB Project, Conditions are likely to be included as part of that ML. This AEMP relates only to the DCO Requirements and therefore will be updated to include details relevant to ML Conditions where necessary. This detail will be submitted to NRW (PS) for approval, in accordance with ML Conditions for the TLSB Project.

1.4 The role of the AEMP

- 1.4.1 This document presents TLSB's AEMP for the Tidal Lagoon Swansea Bay development (the TLSB Project). Adoption of an AEMP is a Requirement of the DCO for the TLSB Project (Requirement 6).
- 1.4.2 The purpose of the AEMP is to guide the monitoring, mitigation and management of the environmental effects of the TLSB Project throughout its lifetime. It is of particular relevance for those areas where there is a level of uncertainty regarding impacts. As such, an adaptive approach is required to ensure a range of potential outcomes can be managed and adverse impacts avoided and minimised wherever possible. The AEMP has been developed in accordance with potential effects identified during the Environmental Impact Assessment (EIA) process for the TLSB Project, as reported in the Environmental Statement (TLSB, 2014)¹ and the proposed mitigation and management. It has also been designed to maximise learning opportunities, where appropriate, for future lagoon developments. This is set out further in Section 2 where the specific Functions of the AEMP are described.
- 1.4.3 Note that in Sections 1-3 of the AEMP, the term 'monitoring' also encompasses the term 'surveillance' when referring to the AEMP process. Whether an objective delivers monitoring or surveillance is set out at the individual Objective level.
- 1.4.4 The AEMP sets out the environmental management framework relevant for all phases of the TLSB Project; from pre-construction baseline monitoring, through construction and operation phases of the TLSB Project. Due to the long lifespan of the TLSB Project (~120 years), monitoring or surveys that are required during the decommissioning and post-decommissioning phases will be developed as part of the on-going AEMP review process (See Section 3) nearer to the time and prior to the commencement of that process.

¹ TLSB (2014) *Tidal Lagoon Swansea Bay Environmental Statement*

- 1.4.5 Section 3 of the AEMP also defines the process by which the findings of the monitoring programme will be reviewed and how actions will be defined and incorporated into future phases of the monitoring, mitigation and management programme. In this way, the actual effects of the TLSB Project will be measured and, where necessary, appropriate action can be taken to address any relevant identified issues. The key stages of the AEMP process are illustrated in Figure 1.1. More detail on the process is set out in the remainder of the AEMP.
- 1.4.6 The adaptive element of the management plan approach relates to the process whereby management decisions, including future monitoring requirements, can be altered or developed on the basis of knowledge gained through the agreed monitoring programme. This means that where necessary, management practices and responses can change to address environmental effects as they become apparent throughout the lifetime of the TLSB Project. The adaptive nature therefore allows the monitoring and management to respond to any unforeseen or unpredicted effects which may come to light during the course of the TLSB Project. It also allows monitoring to stop if no effects or negligible effects are recorded.
- 1.4.7 The specific AEMP monitoring (set out in Sections 4 – 11) will be reviewed and any updates will be undertaken through an annual process to provide the best possible understanding of the TLSB Project's environmental effects and to respond accordingly (see Section 3 for further details). Periodic Substantive Reviews of the AEMP process in its entirety will be undertaken annually and every 5 years (see section 3.2.9 and 3.2.10), to ensure the AEMP is efficient and remains fit for purpose. The importance of monitoring to confirm impacts and the effectiveness of mitigation is recognised in the UK Marine Policy Statement and is a key principle on which the UK's marine planning process is built.
- 1.4.8 The AEMP provides a clear focus for considering the environmental effects of construction and operation of the TLSB Project where there is uncertainty. It sets out the monitoring commitments, trigger levels (or a framework for trigger levels to be set and developed, where relevant and deliverable) and defines the process for undertaking further action and mitigation, if needed.

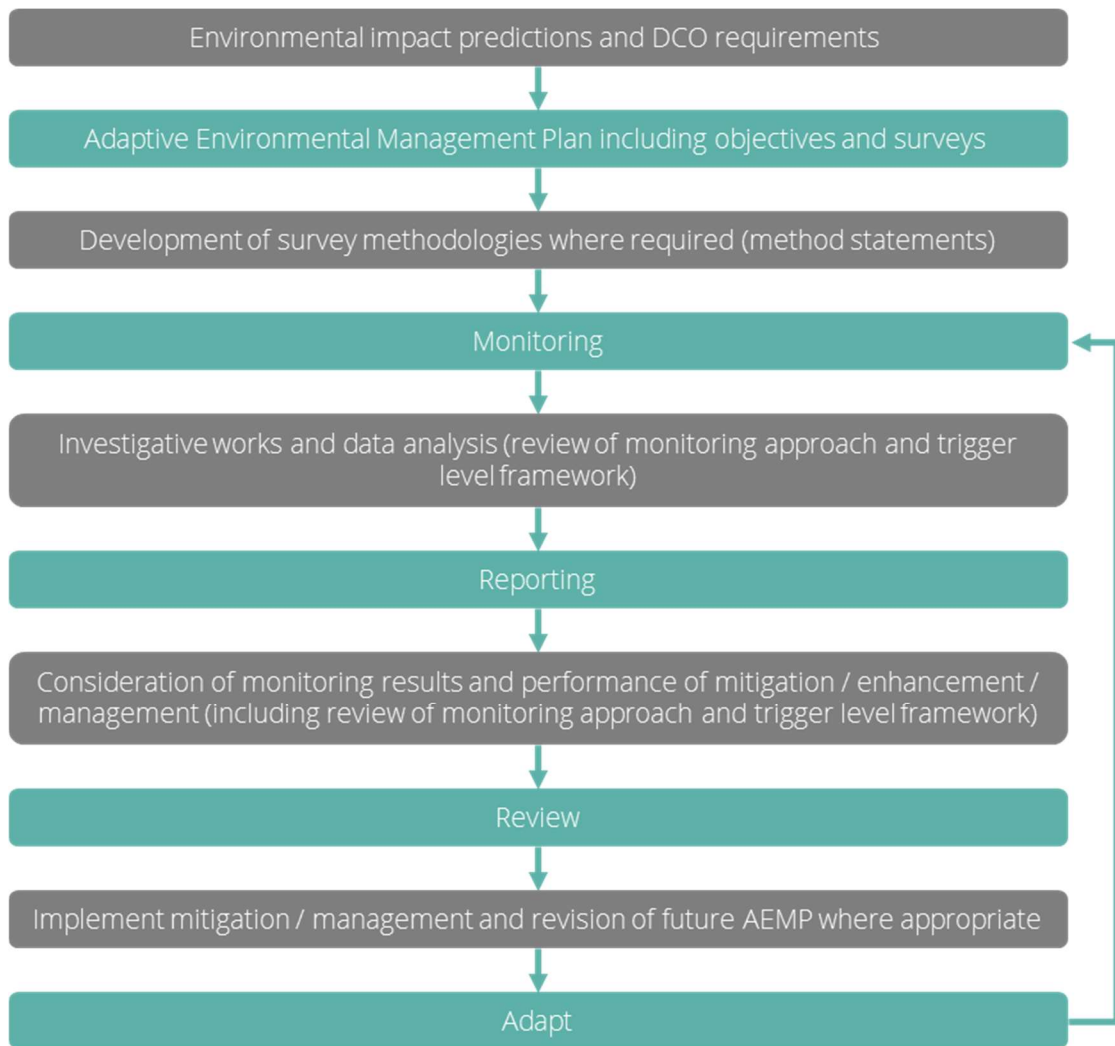


Figure 1.1 Flow diagram showing the key stages in the AEMP process.

1.5 TLSB Environmental Management Plans and Strategies

- 1.5.1 The AEMP is one of three environmental management plans secured through the DCO requirements that will be implemented during the TLSB Project lifetime.
- 1.5.2 As well as the AEMP, a Construction Environmental Management Plan (CEMP) (DCO Requirement 5) will be implemented during construction and an Operational Environmental Management Plan (OEMP) (DCO Requirement 5) will be implemented during operation.
- 1.5.3 In addition, the following strategies identified in the DCO Schedule I, Part 3 are linked to the AEMP:
- Fish and Shellfish Mitigation Strategy (DCO Requirement 27);
 - Avian Enhancement Strategy (DCO Requirement 28);
 - Habitats Creation Strategy (DCO Requirement 29);
 - Honeycomb Worm Translocation Strategy (DCO Requirement 30);
 - Beach Mitigation Management (DCO Requirement 35);
 - Marine Mammal Mitigation Strategy (DCO Requirement 39); and
 - Water Framework (Directive) Strategy (DCO Requirement 42).

- 1.5.4 The environmental strategies will be prepared and submitted for approval by the relevant planning authority prior to the relevant DCO Works in line with the Construction Phasing Scheme (DCO Requirement 3) (see Section 2.2). Note that NRW are the approving authority for the Water Framework Strategy.
- 1.5.5 Monitoring that will be delivered through the AEMP will be referred to in the relevant strategy documents. Where there are links to strategies, this is also set out in the relevant Objectives of the AEMP.
- 1.5.6 All the above strategy documents (with the exception of the Water Framework Strategy) will be appendices to the CEMP.
- 1.5.7 The relationship between the AEMP, the management plans and strategies is shown in Figure 1.2.

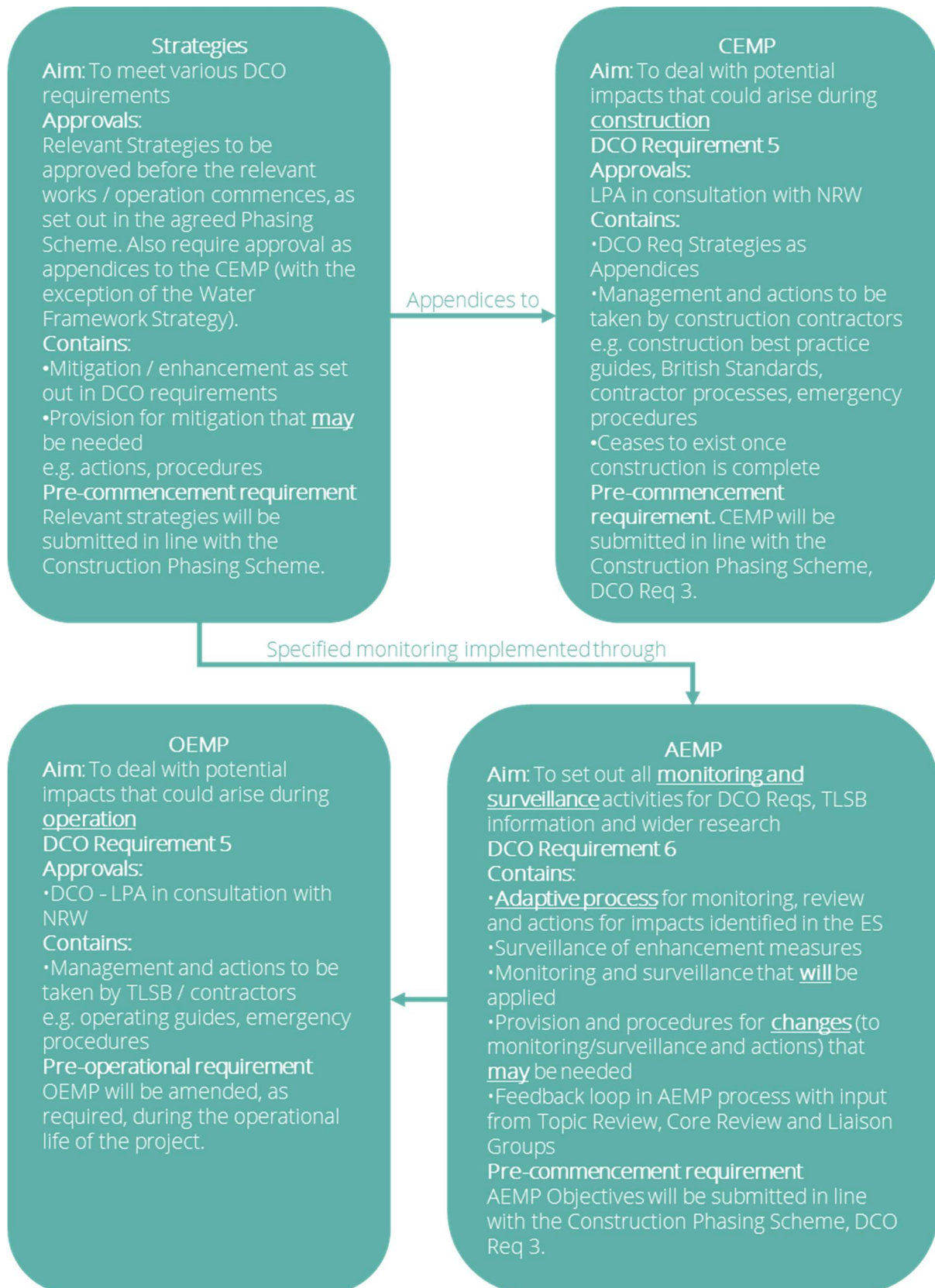


Figure 1.2 Relationship between AEMP, strategies and management plans.

1.6 Construction Environmental Management Plan (CEMP)

- 1.6.1 The CEMP is a separate document that will define how TLSB and its contractors will manage and, where required, minimise the impact of construction activities on the environment and the public.
- 1.6.2 It should be noted that the purpose of the CEMP and AEMP are different. The CEMP is not adaptive and is designed to ensure known environmental impacts associated with construction are managed and minimised, identified mitigation is applied and best practice guidelines are followed. It is therefore a time-limited document, applicable only to the construction phase of the TLSB Project.
- 1.6.3 The AEMP has primarily been developed to monitor specific environmental effects predicted in the ES during operation, to manage areas of uncertainty, to identify impacts outside those predicted and to measure the effectiveness of mitigation and enhancement measures applied.
- 1.6.4 As the CEMP only relates to the management of impacts associated with construction, it will cease to have a role once construction is complete.

1.7 Operational Environmental Management Plan (OEMP)

- 1.7.1 The OEMP will set out how TLSB will manage the day to day running of the TLSB Project during the operational phase. This will include minimising impacts on the environment and the public and, where possible, maximising opportunities for environmental enhancement.
- 1.7.2 Operational management as targeted in the OEMP particularly focuses on turbine operation, waste management, public access control, health and safety requirements, maintenance dredging and operation of the buildings associated with the TLSB Project. Where actions and outcomes of the AEMP process directly affect OEMP procedures e.g. public access control onto habitat creation areas, this will be recognised within the OEMP and a framework put in place to manage the processes for reporting between the AEMP and the OEMP. This will ensure that the results of AEMP monitoring can feed into the OEMP, which will be drafted and approved prior to the operational phase of the TLSB Project.

1.8 Water Framework Strategy (WFS)

- 1.8.1 A Water Framework Strategy (WFS) will be developed in consultation with NRW(A), in accordance with Requirement 42 of the DCO. The Water Framework Directive (WFD) Assessment Report² sets out the potential effects of the TLSB Project in relation to the Objectives of the WFD on relevant waterbodies. The WFS will set out the overarching strategy as to how the results of the monitoring carried out under the provisions of the AEMP, validate the findings of the WFD compliance assessment and meet the requirements of the WFD throughout the lifetime of the TLSB Project.
- 1.8.2 The AEMP review process allows for annual consideration of monitoring output which will provide supporting information to consider the effects of the TLSB Project in relation to WFD water body classification data gathered by the regulator and will also enable management action to be taken, if necessary, following consultation with the regulator. This review process will also support the comprehensive review of water classification data required as part of the statutory six-year review period for the WFD

² *Tidal Lagoon Swansea Bay Water Framework Directive Assessment Report TLSB (v2 2014)*

under the River Basin Management Plan (RBMP) (published by NRW) (see Section 3 for more information on the AEMP review process).

- 1.8.3 Where monitoring is relevant for the WFD, this is set out in the AEMP Objectives. The overall process of monitoring, data review, reporting and communication with NRW(A) will also be set out within the WFS.

1.9 Policy and guidance for adaptive management

- 1.9.1 TLSB's approach to adaptive management is in line with guidance set out on page 18 of the EC Guidance Note 'The implementation of the Birds and Habitats Directives in estuaries and coastal zones with particular attention to port development and dredging' (2011), which states that:

"Where uncertainties or lack of knowledge on physical, morphological or biological processes still exist, these should be minimised as far as possible by additional research; where uncertainty remains, adaptive monitoring programmes should be foreseen. New evidence and scientific information should be fed back into the management plan and where necessary lead to an appropriate adaptation of the management measures and monitoring schemes."

- 1.9.2 The EC guidance (2011) also states (page 29) that "Monitoring schemes should be designed in a way that they signal any unexpected developments at a stage where effective corrective measures can still be taken". This aspect of the overall monitoring procedure will be delivered through a process of ongoing review and feedback that will operate throughout the lifetime of the TLSB Project (see Section 3). Any required changes to the monitoring programme and implementation or modification of measures required to deal with potentially detrimental environmental effects (as informed via the monitoring) will be approved through the AEMP review process.
- 1.9.3 The AEMP framework also allows for the discussion and presentation of survey results, review and amendments of survey requirements and methodologies (as necessary) and ongoing consideration of whether objectives remain 'fit for purpose'.
- 1.9.4 There is currently no adopted policy for tidal lagoons and therefore National Policy Statement for Renewable Energy Infrastructure EN-3 (NPS EN-3) is the most relevant. As such the overall approach that is being promoted via this AEMP is also reflected in the guidance set out in NPS EN-3. In relation to monitoring of offshore windfarms, NPS EN-3 states that *"the IPC³ should consider requiring the applicant to undertake monitoring prior to and during construction and during its operation in order to measure and document the effects of the development"*.
- 1.9.5 Similarly, guidance in respect of monitoring for construction and operation of offshore renewable energy projects is also provided by Cefas⁴, which states:

"Monitoring conditions attached to consents and licenses can therefore be used to validate predictions made in Environmental Statements. An extension of this testing of predictions is to identify unexpected outcomes or impacts and, where appropriate, trigger the development of corrective actions. Given the limited base information, monitoring can also be used to deal with uncertainties within Environmental

³ Previously Nationally Significant Infrastructure Projects (NSIPs) were dealt with by the Infrastructure Planning Commission (IPC). Under the Localism Act 2011, the IPC was abolished on 1 April 2012. Its Functions transferred to the Planning Inspectorate on that date and are now delivered by its National Infrastructure Directorate.

⁴ *Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects. Cefas contract report: ME5403 – Module 15. May 2012.*

Statements by testing hypotheses on the nature, extent and duration of potential novel impacts.”

- 1.9.6 TLSB has taken into account this guidance and the procedures that it embodies in the development of this AEMP and considers that this document sets out an appropriate monitoring and management framework through which to validate the findings of the ES and to manage potential uncertainties in the response of sensitive receptors to development, in what is a dynamic and complex environment.

1.10 Development of the AEMP since the DCO was awarded

- 1.10.1 The Development Consent Order for the TLSB Project was awarded in 2015. An outline AEMP was submitted along with the DCO application, which set out TLSB’s proposals for monitoring and management of the TLSB Project.
- 1.10.2 The DCO demands a number of commitments that the AEMP must address. DCO requirement 6(1) states that the AEMP must be “*substantially in accordance with the outline Adaptive Environmental Management Plan*” as it was submitted in 2015.
- 1.10.3 Since the DCO was awarded, TLSB have worked with the relevant Planning Authorities and NRW to develop the AEMP to meet the requirements of the DCO and, as a result, the AEMP has evolved from the outline version submitted in 2015. Table 1.1 sets out how the final AEMP submitted for approval is substantially in accordance with the outline version submitted with the DCO application. As the outline AEMP was produced before the DCO was granted, certain aspects of the Objectives have been captured by other DCO Requirements, protective provisions or the S106 agreement. Table 1.1 makes it clear where these requirements are met through other documents or arrangements.

Table 1.1 How AEMP v9 is substantially in accordance with the outline AEMP v4.

Outline AEMP Objective no.	Outline Objective description	Where outline AEMP Objective is covered in AEMP submitted for approval (AEMP v9)
CP1	Intertidal - to monitor potential change to intertidal areas through beach profiles (no change or more stable beach profiles across wider area; accretion at Crymlyn Burrows adjacent to Lagoon wall).	CP1 - To monitor changes in the intertidal area within Swansea Bay CP7 - To review windblown sand on Oystermouth Road
CP2	Subtidal – monitor broad scale changes in bathymetry and intermittent increase localised subtidal siltation.	CP2 - To monitor changes in bathymetry within Swansea Bay during operation
CP3	To examine the levels of sediments (accretion and erosion) within the lagoon and navigation channels.	ABP protective provisions
CP4	To examine changes in wave reflection, suspended sediments and currents outside the lagoon.	CP4 - To record localised changes in wave reflection and currents within and outside the Lagoon during operation
CP5	To examine changes in currents as a result of the turbine and sluice gate operation.	CP5 - To record changes in localised flows around the turbine housing during operation
CP6	<i>(not included within outline AEMP).</i>	CP6 - To monitor levels of sedimentation in the Monkstone Marina
CP7	<i>(not included within outline AEMP).</i>	CP7 - To review windblown sand on Oystermouth Road
WQ1	To investigate water quality and re-suspension of sediments.	WQ3 - To review potential resuspension of sediments from marine construction
WQ2	To examine bacteriological water quality within the lagoon.	WQ1 - To monitor bacteriological water quality within the lagoon and review bathing water compliance data within Swansea Bay during operation
WQ3	Further understanding of bacterial water quality influence outside lagoon.	WQ1 - To monitor bacteriological water quality within the lagoon and review bathing water compliance data within Swansea Bay during operation
WQ4	To examine water quality (nutrients) within the Neath Estuary, Tawe Estuary and Swansea Bay.	WQ2 - To monitor nutrient levels within the Neath Estuary, Tawe Estuary and Swansea Bay; and to monitor chlorophyll levels within the Lagoon during operation
ME1	To maximise the colonisation opportunities associated with the lagoon seawalls.	ME1 - To monitor colonisation of the lagoon seawall and additional biodiversity offsetting measures
ME2	To minimise the potential for colonisation of the seawall by invasive species.	ME1 - To monitor colonisation of the lagoon seawall and additional biodiversity offsetting measures ME6 - To record colonisation of the lagoon by marine INNS
ME3	To study to examine intertidal habitat extents and any changes in habitats in the lagoon and wider Bay.	ME2 - To monitor changes in intertidal habitats within Swansea Bay
ME4	To examine the changes in subtidal benthic ecology resulting from the TLSB Project.	ME3 - To monitor broad-scale changes in subtidal benthic ecology within Swansea Bay

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Outline AEMP Objective no.	Outline Objective description	Where outline AEMP Objective is covered in AEMP submitted for approval (AEMP v9)
ME5	To monitor the effect of the TLSB Project on <i>Sabellaria</i> species within Swansea Bay and to monitor colonisation of the seawall by <i>Sabellaria</i> species.	ME4 - To monitor the Port and Tawe <i>Sabellaria alveolata</i> reefs within Swansea Bay including translocation and biodiversity offsetting measures ME5 - <i>Sabellaria alveolata</i> further remedial action review process
ME6	To maximise the potential for the reintroduction of the native oyster.	ME7 - To record the success of native oyster rearing within the Lagoon
F1	To assess fish passage through the turbines.	F1 - To validate fisheries numerical models
F2	To examine the effects of the TLSB Project on herring.	F3 - To monitor herring spawning mitigation on the western Lagoon seawall
F3	To examine broad scale changes in fish fauna assemblage within Swansea Bay pre and post construction.	F4 - To monitor any broad scale changes in fish fauna assemblage within Swansea Bay and gain an understanding of the fish diversity associated with the seawall
F4	To examine the diversity and abundance of fish associated with the artificial reef.	F4 - To monitor any broad scale changes in fish fauna assemblage within Swansea Bay and gain an understanding of the fish diversity associated with the seawall
F5	To review migratory fish stocks on the Afan and Tawe.	F2 - To monitor migratory fish populations in local rivers and fisheries mitigation measures
F6	Analyse rod catch data to understand any effects of the Lagoon.	F2 - To monitor migratory fish populations in local rivers and fisheries mitigation measures
F7	To review NRW WFD Compliance Data to assess any changes in ecological status.	F2 - To monitor migratory fish populations in local rivers and fisheries mitigation measures F4 - To monitor any broad scale changes in fish fauna assemblage within Swansea Bay and gain an understanding of the fish diversity associated with the seawall
F8	To monitor fish movements across Swansea Bay and into/out of the Lagoon by acoustic telemetry.	F1 - To validate fisheries numerical models
MM1	Marine mammal monitoring to understand effects of TLSB Project.	MM1 - Surveillance of cetacean use within Swansea Bay MM2 - To monitor marine mammal interaction with the turbine house/slucie gate structures
MM2	To minimise and further understand the potential effects of construction.	Marine Mammal Mitigation Strategy MM1 - Surveillance of cetacean use of Swansea Bay
MM3	To examine the potential for interaction with the TLSB Project during operation.	MM1 - Surveillance of cetacean use within Swansea Bay MM2 - To monitor marine mammal interaction with the turbine house/slucie gate structures

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Outline AEMP Objective no.	Outline Objective description	Where outline AEMP Objective is covered in AEMP submitted for approval (AEMP v9)
CB1	To monitor change in bird usage in the lagoon and wider Bay.	CB1 - Surveillance of over-wintering and passage bird use in Swansea Bay, with particular focus on sanderling and ringed plover features of Blackpill SSSI
CB2	To monitor usage of lagoon and enhancement measures.	CB2 - Surveillance of avian enhancement measures within the lagoon
TE1	To minimise potential effects on Crymlyn Burrows (SSSI) and other dune systems within Swansea Bay.	CE1 - To monitor frontal dune system of Crymlyn Burrows SSSI CE2 - Review of dune systems of Swansea Bay SINC
TE2	To minimise the deterioration or loss of existing coastal grasslands and to optimise the potential of the introduced coastal grassland.	CE3 - Surveillance of coastal habitat creation areas
TE3	To maximise the potential for creation of saltmarsh within the designated area of the lagoon.	CE3 - Surveillance of coastal habitat creation areas
TE4	To optimise the creation of sand dunes within designated area of the lagoon.	CE3 - Surveillance of coastal habitat creation areas
TE5	To minimise the potential for colonisation by invasive species.	Terrestrial Invasive Species Plan CE4 - To review <i>Spartina anglica</i> growth on Blackpill SSSI
TE6	To minimise the loss or deterioration of extent of notable plants.	CE3 - Surveillance of coastal habitat creation areas
TE7	To minimise the potential effects of lighting of the TLSB Project on bats.	CE5 - To investigate the potential effects of the project on bats (Surveillance of bat use along the southern edge of the Docks Estate)
TE8	To minimise the potential effects of the TLSB Project on Otters – access and lighting.	CE6 - To investigate the potential effects of the project on otters (Surveillance of otter use along the southern edge of the Docks Estate)
TE9	To minimise the potential effects of construction of the TLSB Project on reptiles.	Reptile Strategy (as part of the CEMP)
TE10	To minimise the potential effects of the TLSB Project on Invertebrates.	CE3 - Surveillance of coastal habitat creation areas
N1	To further characterise the baseline noise environment within the Bay and the effects of construction and operation of the TLSB Project on fish and marine mammals.	N1 - To record marine noise levels during construction and operation within Swansea Bay

2 Overview of the AEMP

2.1 Introduction

- 2.1.1 The AEMP provides a structure and framework to enable ongoing review of the monitoring programme during the construction and operational phases of the TLSB Project. This allows verification and audit of the environmental effects of the TLSB Project, and informs any need for management response.
- 2.1.2 As the TLSB Project is the first of its kind in the UK, there is a level of uncertainty regarding the nature and significance of some impacts that may result from the TLSB Project. While certain aspects of the construction and operation of the tidal lagoon infrastructure are analogous to existing structures (such as coastal sea defence walls), information regarding the environmental effects associated with the construction or operation of other components (such as marine turbines) is limited. As such, a comprehensive and intensive programme of monitoring and mitigation has been developed for the TLSB Project.
- 2.1.3 The AEMP focuses on the likely significant effects predicted in the ES, however the monitoring proposed in this AEMP extends beyond this. The AEMP as a whole is designed to monitor those aspects where there are uncertainties, to generate a holistic dataset to reinforce that understanding, and to generate data to advise future developments. The proposed monitoring and the adaptive nature of the AEMP process allows management and monitoring to respond to unpredicted or unforeseen effects, should they occur during the lifetime of the TLSB Project.
- 2.1.4 The monitoring proposed by TLSB presents a significant opportunity to enhance a wider understanding of environmental baselines and the effects of tidal lagoon projects. The potential increase in understanding has the ability to provide wider knowledge benefits to a range of stakeholders in the planning and assessment of future projects.
- 2.1.5 The programme of monitoring proposed has recognised these aspects and the AEMP has been developed with separate Functions, to clearly identify the rationale behind any monitoring proposed for each of the environmental topic areas. Four specific Functions have been identified (additional details are provided in Table 2.1):
- Function A: Testing the predictions set out in the Environmental Statement (ES);
 - Function B: Verifying the effectiveness of mitigation or offsetting measures;
 - Function C: Informing on-going management practices; and
 - Function D: Informing other Objectives and developing a holistic understanding of impacts.
- 2.1.6 In addition to the specific functions identified above and explained further in Section 2.4, the monitoring allows the AEMP to identify and respond to unpredicted or unforeseen effects, should they occur during the lifetime of the TLSB Project. Potential unforeseen effects (potentially positive and/or negative) may be identified as a result of monitoring and surveillance undertaken as part of the AEMP, or notified to TLSB by NRW, the Local Planning Authorities (LPAs) or members of the public. See Section 3 for further details.

2.2 Construction Phasing Scheme

- 2.2.1 The Construction Phasing Scheme is a Requirement of the DCO for the Authorised Development (DCO Requirement 3). The Scheme must set out which Requirements are to be approved in whole or in part and the relevant DCO Work phase to which the requirement relates. The Scheme must also set out the sequence of construction for the Authorised Development (the works set out in Parts 1A and 1B of Schedule 1 the DCO).
- 2.2.2 Accordingly, TLSB has produced a Construction Phasing Scheme for approval by the Relevant Planning Authorities. The Scheme links DCO Requirements to DCO Work(s) as listed within Part 1A and 1B of Schedule 1 of the DCO. Each DCO Work represents a phase of construction for the Authorised Development (DCO Works Phase). Relevant DCO Works cannot commence until the DCO Requirements related to it are approved by the Relevant Planning Authorities, in accordance with the Construction Phasing Scheme.
- 2.2.3 The Construction Phasing Scheme sets out the phasing of approvals for those DCO Requirements which relate to the construction of the Authorised Development only. DCO Requirements which relate to the operation of the Authorised Development will be approved by the Relevant Planning Authorities, in consultation with NRW, prior to operation unless otherwise stated in the Scheme, as set out within the DCO.
- 2.2.4 The Construction Phasing Scheme sets out:
- Which DCO Requirements relate to which DCO Works;
 - Which DCO Requirements are to be approved in whole or in part; and
 - The sequence of construction of DCO Works.
- 2.2.5 The AEMP includes elements that cover both construction and operation of the TLSB Project. In accordance with DCO Requirement 3 and as set out in the Construction Phasing Scheme, the relevant parts of the AEMP will be approved by the Relevant Planning Authority in consultation with NRW prior to a specified DCO Work commencing. For full details regarding the DCO Works refer to the Construction Phasing Scheme (DCO Requirement 3).
- 2.2.6 The location of the DCO Works is shown in Appendix 1. The sequence of construction of DCO Works, with respect to the earliest commencement date, is set out in Appendix 2.

2.3 Overview of AEMP structure

2.3.1 The programme of monitoring and mitigation within the AEMP has been set out based on environmental topics (see Figure 2.1). Each environmental topic forms a Section of this AEMP as follows:

- Section 4 – Coastal Processes;
- Section 5 - Water Quality;
- Section 6 - Intertidal and Subtidal Benthic Ecology;
- Section 7 - Fish;
- Section 8 - Marine Mammals;
- Section 9 - Coastal Birds;
- Section 10 - Coastal Ecology; and
- Section 11 - Marine Noise.

2.3.2 For each of these environmental topics, Objectives for monitoring have been developed based on the defined Function i.e. the purpose of the monitoring (see Table 2.1). Most Objectives have been developed to specifically inform operational procedures, but in some cases also provide information that informs other Objectives.

2.3.3 Each Objective sets out the rationale behind the monitoring and data review that would be used to deliver that particular Objective. Where appropriate, trigger levels are identified (see Section 2.8), and an outline is provided of further investigation, additional monitoring, mitigation or management which could be undertaken if significant detrimental effects were to be detected or trigger levels breached.

2.3.4 Surveys have been developed to meet the requirements of each Objective, taking account of advice from the Planning Authorities and NRW. Where appropriate, Method Statements (MS) will be prepared in line with the Construction Phasing Scheme. MS set out in more detail the surveys, providing additional information on aspects such as survey methodology, timing, frequency, sample storage, analysis (against triggers, if appropriate) and reporting. The MS are written to provide the level of detail that could be supplied to contractors that may carry out the survey work and to ensure that surveys and analyses are repeatable and comparable. Figure 2.1 sets out the structure as described and further detail on the Surveys and MS is provided in Section 2.5.

Aim: To set out all monitoring and surveillance activities for DCO requirements, TLSB information and wider research

Contains:

- Adaptive process for monitoring, review and actions for impacts identified in the ES
- Monitoring and surveillance that **will** be applied
- Provision and procedures for change (to monitoring/surveillance and actions) that **may** be needed
- Feedback loop in AEMP process with input from Topic Review, Core Review and Liaison Groups

Topics

Coastal Processes

Water Quality

Intertidal & benthic ecology

Fish

Marine Mammals

Coastal Birds

Coastal Ecology

Marine Noise

Objectives

Meet a specific monitoring need e.g. CP1 to monitor change in the intertidal area. There may be one or more Objectives for each Topic.

Objectives may be designed to meet DCO requirements, monitor EIA predictions, inform management practices, evaluate WFD or provide information / research data for TLP.

Objectives may include information on trigger levels, location(s) covered by the Objective, duration over which the Objective is monitored and links to other Objectives

Coastal Processes (CP1-7)

Water Quality (WQ1-3)

Intertidal & benthic ecology (ME1-7)

Fish (F1-4)

Marine Mammals (MM1-2)

Coastal Birds (CB1-2)

Coastal Ecology (CE1-6)

Marine Noise (N1)

Surveys

Set out the general details of how surveys will be carried out e.g. location, standard methods to be used, data to be collected. There may be one or more surveys for each objective e.g. there are two surveys for Water Quality Objective 1 (WQ-S1 and WQ-S2)

Method Statements

Method Statements (MS) provide more detailed descriptions of survey procedures, where they are needed.

Not all Surveys require a MS (e.g. if they follow a standardised procedure that is set out in guidance or if all required information is in the Survey document).

Some MSs include details for more than one Survey (e.g. ME-MS1 includes details for ME-S1 and ME-S2 Marine Ecology Objectives). MS will ensure data is comparable between surveys, no matter who undertakes the survey. MSs may be sent to contractors.

Increasing level of detail

Figure 2.1 Structure of the AEMP.

2.4 Monitoring Functions and Objectives in environmental topics

- 2.4.1 As outlined in Section 2.1, monitoring Objectives have been established according to the definition of the Functions as set out in Table 2.1. These are colour coded for ease of reference.

Table 2.1 Summary of definitions for Monitoring Functions.

Monitoring Function	Title	Description
Function A	Testing ES Predictions	This type of monitoring will be conducted to test predictions made in the ES. The monitoring will focus on key areas of uncertainty or where there could be a significant impact on receptors that may require mitigation. Where no significant adverse impacts were predicted, the Objective does not form a Function A. Monitoring will focus on detection of significant change in the relevant receptor. <u>Where appropriate</u>, monitoring will guide the establishment and nature of trigger levels, either quantitative or qualitative. These trigger levels will be developed based on the methods used to detect significant change in the relevant receptor and will be used to determine if further investigation that may result in additional/revised monitoring or mitigation/management action is required (see Section 2.8).
Function B	Mitigation/offsetting effectiveness	This type of monitoring is intended to confirm the effectiveness of mitigation or offsetting identified in the ES. It should be noted that mitigation referred to in this Function also includes mitigation identified for the TLSB Project within the ES as a result of other legislative requirements or drivers (e.g. the Water Framework Directive) and not only mitigation for significant adverse effects. Monitoring will focus on the effectiveness of the implementation of the mitigation and offsetting for an affected receptor. <u>Where appropriate</u>, monitoring will guide the establishment and nature of trigger levels, either quantitative or qualitative. These trigger levels will be developed based on the methods used to test the effectiveness of the mitigation and offsetting and will be used to determine if further investigation that may result in additional/revised monitoring or mitigation/management action is required (see Section 2.8).
Function C	Management response	This type of monitoring will collect and review data that may be used to inform existing management practices e.g. dredging practices at Monkstone Marina, management of dune frontage at Crymlyn Burrows SSSI and Swansea Bay SINC. Monitoring will focus on detection of significant change in the relevant receptor. <u>Where appropriate</u>, monitoring will guide the establishment and nature of trigger levels, either quantitative or qualitative. These trigger levels will be developed based on the methods used to detect significant change in the relevant receptor and will be used to determine if further investigation that may result in additional/revised monitoring or mitigation/management action is required (see Section 2.8).

Monitoring Function	Title	Description
Function D	Informing other Objectives and developing an holistic understanding of impacts	This type of monitoring and surveillance will be used for a number of purposes: • to inform other Objectives, e.g. data from marine noise Objectives will inform Objectives related to marine mammals. • to inform operational procedures i.e. future maintenance dredging operations or the effectiveness of proposed habitat enhancement measures. • to validate numerical models. • to provide an holistic data set which can improve understanding of any changes in the environment within which the TLSB Project is situated, resulting from its construction and operation. • to advise detail of policy/guidance on future tidal lagoon projects. These Objectives will not be related to trigger levels as they have been developed to provide further information to evaluate specific aspects of the TLSB Project for the purposes set out above. <u>Where appropriate</u>, the use of an approach that provides a quantitative or qualitative mechanism to detect change to an identified receptor, or to evaluate the effectiveness of an enhancement feature will be adopted. If it is identified through any monitoring carried out under this Function that a significant effect is occurring on an identified receptor, then this will be reported within the AEMP process and if required, further investigations carried out to establish if additional/revised monitoring or management is appropriate (see Section 2.9).

2.4.2 Considering the Function of the monitoring as set out in Table 2.1, Objectives have been developed for each of the environmental topics (Table 2.2). For each of the defined Objectives, information is provided in the form of a table. The table and the associated surveys and Method Statements identified in Table 2.3 provide the following information:

- The overall Objective of the monitoring, including (where relevant) reference to the potential environmental effects to be monitored as identified within the ES, links with DCO requirements (including reference to any strategy documents listed in section 1.4), and whether relevant to the WFD;
- Primary Function of the Objective (i.e. Function A, B, C or D) and the rationale behind the monitoring to support the Objective. The Functions are colour-coded for ease of reference as presented in Table 2.1;
- Background and potential effects related to the Objective;
- Characterisation and/or baseline surveys undertaken to date or planned for the future (primarily with a focus on pre-construction);
- Proposed repeat monitoring surveys and timeframe (generally associated with construction and operation phases);
- Key receptors of the potential effect;
- Trigger levels (Functions A, B and C) – Where appropriate, trigger levels have been defined. Wherever possible these have been quantified. In

some cases, it is not possible to set trigger levels at this stage without further evaluation of monitoring results and/or discussion with NRW(A) and the Planning Authorities. Further detail on trigger levels is provided in Section 2.8;

- Further/remedial action to be undertaken (Functions A, B and C); and
- Monitoring approach (Function D) – Where appropriate, a method for detection of change, or for monitoring the effectiveness of enhancement measures has been set out.

Table 2.2 Monitoring Objectives.

Function	Objective	Description
Coastal processes		
A	CP1	To monitor changes in the intertidal area within Swansea Bay
D	CP2	To monitor changes in bathymetry within Swansea Bay during operation
D	CP3	To monitor sedimentation within the lagoon footprint during operation
D	CP4	To record localised changes in wave reflection and currents within and outside the Lagoon during operation
D	CP5	To record changes in localised flows around the turbine housing during operation
C	CP6	To monitor levels of sedimentation in the Monkstone Marina
C	CP7	To review windblown sand on Oystermouth Road
Water Quality		
C	WQ1	To monitor bacteriological water quality within the lagoon and review bathing water compliance data within Swansea Bay during operation
D	WQ2	To monitor nutrient levels within the Neath Estuary, Tawe Estuary and Swansea Bay; and to monitor chlorophyll levels within the Lagoon during operation
D	WQ3	To review potential resuspension of sediments from marine construction
Marine Ecology		
B	ME1	To monitor colonisation of the lagoon seawall and additional biodiversity offsetting measures
A	ME2	To monitor changes in intertidal habitats within Swansea Bay
A	ME3	To monitor broad-scale changes in subtidal benthic ecology within Swansea Bay
B	ME4	To monitor the Port and Tawe <i>Sabellaria alveolata</i> reefs within Swansea Bay including translocation and biodiversity offsetting measures
B	ME5	<i>Sabellaria alveolata</i> further remedial action review process
D	ME6	To record colonisation of the lagoon by marine INNS
D	ME7	To record the success of native oyster rearing within the Lagoon
Fish		
A	F1	To validate fisheries numerical models
B	F2	To monitor migratory fish populations in local rivers and fisheries mitigation measures
D	F3	To monitor herring spawning mitigation on the western Lagoon seawall
B	F4	To monitor any broad-scale changes in fish fauna assemblage within Swansea Bay and gain an understanding of the fish diversity associated with the seawall
Marine Mammals		
D	MM1	Surveillance of cetacean use within Swansea Bay
A	MM2	To monitor marine mammal interaction with the turbine house/slucie gate structures
Coastal Birds		
D	CB1	Surveillance of over-wintering and passage bird use in Swansea Bay, with particular focus on sanderling and ringed plover features of Blackpill SSSI
D	CB2	Surveillance of avian enhancement measures within the lagoon
Terrestrial Ecology		
C	CE1	To monitor frontal dune system of Crymlyn Burrows SSSI
C	CE2	Review of dune systems of Swansea Bay SINC
D	CE3	Surveillance of coastal habitat creation areas
C	CE4	To review <i>Spartina anglica</i> growth on Blackpill SSSI
B	CE5	To investigate the potential effects of the Project on bats (Surveillance of bat use along the southern edge of the Docks Estate)
B	CE6	To investigate the potential effects of the Project on otters (Surveillance of otter use along the southern edge of the Docks Estate)
Noise		
D	N1	To record marine noise levels during construction and operation within Swansea Bay

2.5 Responsibilities for surveys and monitoring

- 2.5.1 Information on responsibilities for each area of survey and monitoring work is set out within each of the Objectives. The majority of the monitoring proposed will be the responsibility of TLSB and will be undertaken by independent specialist consultants.
- 2.5.2 In some instances, survey/monitoring is currently the responsibility of the Local Authority or NRW. Where this is the case, their responsibility for monitoring will continue. The data will be examined by TLSB where appropriate and should there be an adverse effect linked to the TLSB Project, further action will be reviewed through the AEMP process (see Section 3).

2.6 Surveys and monitoring Method Statements (MS)

- 2.6.1 In addition to the Objectives, which outline the reasons for monitoring, the AEMP provides more specific detail on the monitoring programme/surveys associated with each Objective and the methods to be used in carrying out the surveys, monitoring and analysis.
- 2.6.2 It is important to note that, other than monitoring associated with turbine encounters for fish and marine mammals and effects on *Sabellaria*, all of the proposed monitoring is linked to effects and aspects of the TLSB Project for which there is a good knowledge base and well-established survey and monitoring techniques developed. Any uncertainty for the majority of issues is restricted to the potential environmental response to the effects of the TLSB Project (for which the monitoring is being implemented) rather than the means by which the response can be monitored and measured. Industry standard survey and monitoring techniques will be employed as these are tried and tested and have been readily utilised for other projects in coastal and marine environments.
- 2.6.3 The Surveys identify in broad terms the locations, timings, general approach to data collection and any standard guidance that will be followed, to ensure adequate monitoring is undertaken for that Objective. As stated, wherever possible, surveys will be carried out following standard industry guidance (e.g. bat surveys).
- 2.6.4 In some instances, where methodologies do not follow standard guidance, for example where none exists, or where it is considered that further input and review from regulators is required, separate monitoring Method Statements (MS) will be produced to provide the necessary detail.
- 2.6.5 MS will describe the detailed methodology, how data will be processed and interpreted for the relevant Objective and details of trigger levels, where necessary and appropriate (see Section 2.8). The MS are written to provide the level of detail that might be supplied to contractors to carry out the survey work and to ensure that surveys are repeatable and their results comparable. The MS are part of the AEMP but are drafted so that they could be standalone documents provided as part of instructions to survey contractors.
- 2.6.6 MS will be approved prior to the commencement of a specific DCO Work, as set out in the Construction Phasing Scheme (see Section 2.2). When MS are developed for monitoring required in later phases of the TLSB Project, the best and most appropriate techniques available at that time will be considered. This approach has been adopted to take advantage of rapidly advancing technology. It also allows opportunities for TLSB to commission research into developing more specific monitoring technologies appropriate for tidal lagoon projects based on techniques currently available (e.g.

research currently underway for marine mammal monitoring in conjunction with the Sea Mammal Research Unit (SMRU)).

- 2.6.7 Table 2.3 sets out the MS associated with the various surveys and Objectives, linked to the Construction Phasing Scheme and relevant DCO Works.
- 2.6.8 As monitoring techniques/technology or understanding changes over the lifetime of the TLSB Project, MS will be reviewed, agreed and updated as part of the AEMP review process (see Section 3).
- 2.6.9 Some of the detailed monitoring MS will follow on from the ES baseline or pre-construction surveys that have already been conducted. Some surveys, such as those for the Monkstone Cruising and Sailing Club, will involve TLSB taking over existing monitoring protocols. Where this is the case, the monitoring MS will outline the previous agreed methods used. Any future changes that may be needed to such MS will be considered and actioned through the normal AEMP review process.

Table 2.3 Summary of the AEMP Objectives, Surveys, Method Statements and relevant DCO Works.

Objective	Function	Description	Survey	MS	Survey description	Relevant DCO Works
Coastal Processes						
CP1	A	To monitor changes in the intertidal area within Swansea Bay	CP-S1	CP-MS1	Beach profile monitoring and Rapid Geomorphological Assessment	1a, 1b, 2a, 2b
			CP-S2	CP-MS1	Intertidal sediment sampling	
			CP-S3	-	Fixed point photography along the lagoon walls	
			CP-S4	CP-MS2	High resolution aerial survey	
CP2	D	To monitor changes in bathymetry within Swansea Bay during operation	CP-S5	CP-MS3	Multi-beam echosounder bathymetric survey of the wider bay	1a, 1b, 2a
CP3	D	To monitor sedimentation within the lagoon footprint during operation	CP-S6	CP-MS4*	Multi-beam echosounder bathymetric survey within the lagoon footprint	1a, 1b, 2a, 6a
			CP-S7	-	Argus silt meter deployment	
CP4	D	To record localised changes in wave reflection and currents within and outside the lagoon during operation	CP-S8	-	Acoustic Wave and Current (AWAC) and Optical Backscatter Sensor Deployment	1a, 1b, 2a
CP5	D	To record changes in localised flows around the turbine housing during operation	CP-S9	-	Acoustic Doppler Current Profiler (ADCP) transect survey	2a
CP6	C	To monitor levels of sedimentation in the Monkstone Marina	CP-S10	-	Monkstone Cruising and Sailing Club (MCSC) sediment monitoring	1a, 1b, 2a, 2b, 3, 4
CP7	C	To review windblown sand on Oystermouth Road	-	-	No specific surveys required – review of City and County of Swansea Council data on windblown sand.	1a, 1b, 2a, 2b

Tidal Lagoon Swansea Bay

Objective	Function	Description	Survey	MS	Survey description	Relevant DCO Works
Water Quality						
WQ1	C	To monitor bacteriological water quality within the lagoon and review bathing water compliance data within Swansea Bay during operation	WQ-S1	WQ-MS1†	Lagoon tidal cycle bacterial monitoring	1a, 1b, 2a
			WQ-S2	WQ-MS2†	Routine water quality sampling in the lagoon	
WQ2	D	To monitor nutrient levels within the Neath Estuary, Tawe Estuary and Swansea Bay; and to monitor chlorophyll levels within the lagoon during operation	WQ-S3	WQ-MS3	Dissolved Inorganic Nitrogen (DIN) sampling	1a, 1b, 2a
			WQ-S4	WQ-MS4†	Chlorophyll sampling within the lagoon	
WQ3	D	To review potential resuspension of sediments from marine construction	-	-	Pre-construction samples from key areas to be disturbed by construction activities to be tested for metals. (Surveys to be carried out under the CEMP)	1a, 6a, 8a, 2b, 3, 4
Marine Ecology						
ME1	B	To monitor colonisation of the lagoon seawall and additional biodiversity offsetting measures	ME-S1	ME-MS1	Intertidal and subtidal transect, quadrat, rocky shore, rockpool and UAV (drone) surveys on lagoon breakwater and intertidal areas within the lagoon footprint (including translocation and biodiversity offsetting measures) (where possible in relation to health and safety)	1a, 1b
			ME-S2		Intertidal and subtidal transect and quadrat surveys by dropdown camera of the lagoon breakwater and biodiversity offsetting measures	
ME2	A	To monitor changes in intertidal habitats within Swansea Bay	ME-S3	ME-MS2	Intertidal benthic ecology sampling	1a, 1b, 6a

Tidal Lagoon Swansea Bay

Objective	Function	Description	Survey	MS	Survey description	Relevant DCO Works
ME3	A	To monitor broad scale changes in subtidal benthic ecology within Swansea Bay	ME-S4	ME-MS3	Subtidal benthic ecology sampling	1a, 1b, 2a, 8a, 2b, 3,4
ME4	A	To monitor the Port and Tawe <i>Sabellaria alveolata</i> reefs within Swansea Bay including translocation and biodiversity offsetting measures.	ME-S5	ME-MS4	Reef UAV (drone) survey	1a, 6a
			ME-S6		Reef quadrat and core sampling surveys	
			ME-S7	ME-MS5	Larval supply and water quality (food) surveys	
ME5	B	<i>Sabellaria alveolata</i> further remedial action review process	-	-	No specific surveys required	1a, 6a
ME6	D	To record colonisation of the lagoon by marine INNS	-	-	No specific surveys required. Information collected through surveys under Objectives ME1, ME2 and ME3 and the Marine Biodiversity Risk Assessment process will be reported and reviewed through this Objective	1a, 1b, 2a, 6a, 8a, 8c, 8d, 2b, 2c, 2d, 3, 4, 9, 10, 10a, 10f, 10g, 10h
ME7	D	To record the success of native oyster rearing within the Lagoon	ME-S8	ME-MS6‡	To record the success of native oyster rearing within the Lagoon	1a, 6a, 8a, 2b
Fish						
F1	A	To validate fisheries numerical models	F-S1	F-MS1†	Monitoring of fish behaviour at turbine and sluice gate housing structure	2a
			F-S2	F-MS2†	Validation of turbine passage conditions	
			F-S3	F-MS3†	Monitoring of fish movements within Swansea Bay	
F2	A	To monitor migratory fish populations in local rivers and fisheries mitigation measures	F-S4	F-MS4	Monitoring of local river migratory fish populations	2a
			F-S5	F-MS5v	Monitoring of fisheries mitigation measures	
			F-S6	F-MS6†	Development of fish deterrents	

Tidal Lagoon Swansea Bay

Objective	Function	Description	Survey	MS	Survey description	Relevant DCO Works
F3	B	To monitor herring spawning mitigation on the Western lagoon seawall	F-S7	F-MS7	Ichthyoplankton Monitoring Trawls	1a
F4	D	To monitor any broad-scale changes in fish fauna assemblage within Swansea Bay and gain an understanding of the fish diversity associated with the seawall	F-S8	F-MS8	Intertidal and subtidal fish surveys	1a, 1b
Marine Mammals						
MM1	D	Surveillance of cetacean use within Swansea Bay	MM-S1	-	Static acoustic monitoring (CPODs)	6a, 8d, 2c, 10f, 10g
MM2	A	To monitor marine mammal interaction with the turbine house/sluice gate structures	MM-S2	MM-MS1†	Turbine monitoring – marine mammals	2a
Coastal birds						
CB1	D	Surveillance of overwintering and passage bird use in Swansea Bay, with particular focus on sanderling and ringed plover features of Blackpill SSSI	CB-S1	-	High tide (core), WeBS counts and low tide WeBS counts	1a, 1b, 2a, 2b
CB2	D	Surveillance of avian enhancement measures within the lagoon	CB-S2	-	Lagoon bird surveys	1b, 2a, 9, 10
Coastal Ecology						
CE1	C	To monitor frontal dune system of Crymlyn Burrows SSSI	CE-S1	CE-MS1	Frontal dune survey	1b, 2a
CE2	C	Review of dune systems of Swansea Bay SINC	CE-S2	CE-MS2	Dune condition survey	1a, 1b, 2a, 2b

Tidal Lagoon Swansea Bay

Objective	Function	Description	Survey	MS	Survey description	Relevant DCO Works
CE3	D	Surveillance of coastal habitat creation areas	CE-S3	CE-MS3A^ CE-MS3B^ CE-MS3C^	Vegetation and habitat condition surveys	6b, 8b, 9, 10, 10a
			CE-S4	-	Terrestrial invertebrate surveys of created coastal grassland, saltmarsh and dune habitat	-
			CE-S5	-	Strandline invertebrate surveys of new beach	-
			CE-S6	-	Reptile survey	-
			CE-S7	-	Rocky shore vegetation survey	-
CE4	C	To review <i>Spartina anglica</i> growth on Blackpill SSSI	-	-	-	1a, 1b, 2a, 2b
CE5	B	To investigate the potential effects of the Project on bats (Surveillance of bat use along the southern edge of the Docks Estate)	CE-S8	-	Bat activity surveys along the southern edge of the Docks Estate once lagoon operational	6b, 7a, 8a, 8h
CE6	B	To investigate the potential effects of the Project on otters (Surveillance of otter use along the southern edge of the Docks Estate)	CE-S9	-	Surveys for signs of otters along the southern edge of the Docks Estate once lagoon operational	6b, 7a, 8a, 8e, 8h
Noise						
N1	D	To record marine noise levels during construction and operation within Swansea Bay	N-S1	N-MS1	Marine noise construction survey	1a, 1b, 2a, 6a, 8a, 8d, 2b, 2c, 3, 4, 10f, 10g, 10h

Objective	Function	Description	Survey	MS	Survey description	Relevant DCO Works
			N-S2	N-MS2†	Marine noise operational survey	-

NB. Method Statements with the following symbols will be provided for approval at the times specified below:

* prior to works 2a

† prior to (wet commissioning of the first turbines)

‡ prior to oyster hatchery operation

^ prior to completion of construction of the coastal habitat creation areas

∨ prior to the operation of fisheries mitigation measures (if mitigation is required)

2.7 Inter-relationships

- 2.7.1 Although the Objectives have been presented separately within each environmental topic, there are inter-relationships between them. As part of the AEMP reporting process, these inter-relationships will be explored so that the Annual and Substantive Review provide an appropriate representation of the environmental effects of the TLSB Project. The Objectives set out any linkages between the various topics and these will be further expanded within any MS where necessary, to clearly indicate how the data from other surveys will be used to assess the effects of the TLSB Project (see the matrices in Appendix 3 and Appendix 4 for a summary of interactions).

2.8 Trigger Levels for Functions A, B and C

- 2.8.1 A trigger level is defined as a positive or negative ‘test’ to determine whether the findings of monitoring indicate if an environmental response is ‘acceptable’ and whether further action is needed. Further action could include additional investigation, additional monitoring, or a mitigation or management action.
- 2.8.2 As identified in Table 2.1, the Objectives where it may be appropriate to develop trigger levels relate to three key aspects:
- Monitoring that is being undertaken to detect a significant effect on receptors that may require mitigation, i.e. Function A Objectives;
 - Monitoring that is being undertaken to assess the effectiveness of mitigation or offsetting, i.e. Function B Objectives; and
 - Monitoring that is being undertaken to inform existing management practices i.e. Function C Objectives.
- 2.8.3 The trigger levels may focus on one or more elements of monitoring associated with the Objective.
- 2.8.4 Function D objectives do not require trigger levels as set out in Section 2.9.
- 2.8.5 Where feasible, quantifiable trigger levels will be developed, to provide a robust assessment. However, depending on the Objective and the nature of the monitoring for the receptor, a qualitative approach may be required which would be supported by literature and professional judgment. The trigger levels and processes for assessing data against the trigger levels are set out in the relevant Objectives, Surveys and MS.
- 2.8.6 Development of trigger levels may involve the use of statistical thresholds established using a review of historical data sets that define a predicted envelope of natural variation, where a sufficiently robust time series of data exists.
- 2.8.7 Alternatively, hypotheses may be established based on factors such as presence/absence, significant change in extent of receptor, or significant change in condition of receptor.
- 2.8.8 Trigger levels will be developed in consultation with appropriate regulatory and advisory experts and utilising other experts or published literature and guidance, where available.
- 2.8.9 The process and framework for options in response to a trigger level being breached is set out in the relevant Objective and MS.

2.9 Monitoring approach for Function D Objectives

- 2.9.1 Function D Objectives are not related to trigger levels as they have been developed to provide further information to evaluate specific aspects of the TLSB Project for the purposes set out in Table 2.1. These objectives mainly relate to surveillance measures, to see what takes place or how the environment of the lagoon evolves (e.g. surveillance of avian enhancement measures, recording sedimentation within the lagoon).
- 2.9.2 Where appropriate, the use of an approach that provides a quantitative or qualitative mechanism to detect change to an identified receptor or to evaluate the effectiveness of an enhancement feature will be adopted. The approach has been set out within each Function D Objective and considers the specific rationale of the monitoring for that Objective. As an example, hypotheses may be created that consider factors such as presence/absence, change in extent of receptor, or change in condition of receptor. It should be noted that the use of hypotheses would not be appropriate for certain Objectives, such as monitoring localised flows around the turbines, where no baseline is available from which it would be possible to detect change.
- 2.9.3 Inclusion of monitoring/surveillance under Function D therefore enables an assessment of, for example, the effectiveness of enhancement measures without that monitoring being linked to a specific predicted impact or management requirement.

3 AEMP process and reporting

3.1 Introduction

- 3.1.1 This section sets out how TLSB will manage the monitoring and reporting of the AEMP throughout the TLSB Project lifetime, including processes to review and implement adaptive management to address any significant effects, any previously unidentified effects and identify and agree any management actions that may be required.
- 3.1.2 The annual reporting and review process and the substantive review process for the AEMP is set out in the following sections.
- 3.1.3 As part of the process it is important to review findings regularly with the relevant statutory authorities and inform relevant stakeholder groups of the results. As a result, TLSB will establish:
- Subject-specific Topic Review Groups (TRGs) (see section 3.4.20);
 - A Core Review Group (CRG); and
 - A Liaison Group (LG).
- 3.1.4 The purpose, roles and responsibilities of these groups and their membership are also set out below).
- 3.1.5 TLSB will provide the role of Secretariat for all aspects of the review process.

3.2 AEMP Review Processes

- 3.2.1 The purpose of the AEMP is to guide the monitoring, mitigation and management of the environmental effects of the TLSB Project throughout its lifetime. It is designed to be an adaptive plan, to deal particularly with uncertainty at the start of the TLSB Project, increasing understanding as the project progresses and changes over the 120-year lifespan.
- 3.2.2 The AEMP review processes are based on the well-established adaptive management principles of 'monitor, review and amend' applied to a multitude of situations including government policy development, climate change adaptation, business management, marine and land use planning, an example of which is represented by Figure 3.1.

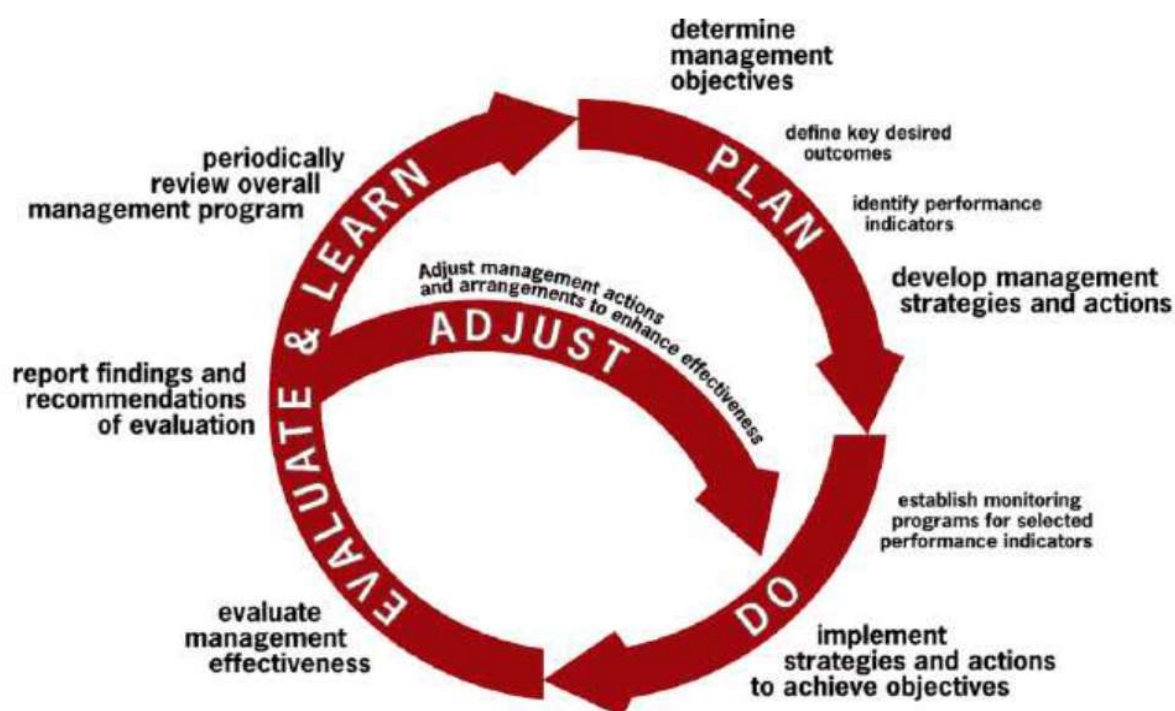


Figure 3.1 An example of an adaptive management cycle.

- 3.2.3 As the project operates, the monitoring data collected will inform the understanding of the TLSB Project operation and the amount of monitoring needed to ensure no significant impacts arise is considered likely to decrease over time. This may mean less frequent surveys, or fewer locations where surveys are needed. It is also possible that after a certain period of time, there is enough certainty regarding the effects so that some monitoring programmes may no longer be required. Alternatively, the 120-year lifespan of the TLSB Project could mean that unforeseen effects may arise at some point in the future. This could also mean that new monitoring, not currently included in the AEMP, might be needed.
- 3.2.4 All these scenarios can be dealt with by the AEMP review processes which enable the monitoring, reporting and management to adapt over time.

AEMP Annual Review Process

- 3.2.5 The Annual Review process enables technical experts from the regulators and TLSB to review the monitoring data over the previous year and to discuss and agree any changes to the monitoring that may be needed.
- 3.2.6 In the event that changes in the environmental receptors are detected, i.e. where trigger levels are breached or other environmental effects attributable to the TLSB Project are identified, the Annual Review process enables decisions to be taken concerning the actions that should be taken. The management or mitigation action will depend on the topic and the significance of the effect. Specific actions that could be considered are set out in the relevant topic sections of the AEMP.
- 3.2.7 New or improved methods of collecting data are likely to become available over the lifetime of the TLSB Project. The Annual Review process allows the most up to date technology to be considered in monitoring programmes.
- 3.2.8 For effects that have not been previously identified, or that are observed outside of the reporting cycle, there may be a need for mitigation/management action to be taken

immediately in order to remedy any potentially significant environmental effect. This would be considered on a case by case basis via the Monitoring Action Sheet (MAS) process (as set out in Section 3.7) which then feeds into the Annual Review process.

AEMP Substantive Review

- 3.2.9 There are two aspects to the AEMP Substantive Review. The first is a Substantive Review of the environmental topic after five years monitoring to examine, for example, any trends in data, whether the decisions taken to amend monitoring have been correct and to review whether the monitoring remains fit for purpose. This will be undertaken at the Topic Review Group (TRG) level and specific details are contained within the relevant Objectives.
- 3.2.10 The second is more about how the AEMP process works rather than the detail of the monitoring itself e.g. an assessment of the effectiveness of the Annual Review process. This will be overseen by the Core Review Group (CRG) and more details on this aspect can be found in Section 3.8.

Annual Monitoring Reports (AMRs)

- 3.2.11 Each year, TLSB (usually through their independent consultants) will produce an Annual Monitoring Report (AMR) for each topic. The AMR will contain the results of monitoring and analysis carried out by TLSB and/or their contractors, along with any recommendations for amendments to the survey approach or the need for mitigation/management action. Monitoring and data analysis to inform the AMR may have been carried out by TLSB directly, or by independent consultants.
- 3.2.12 TLSB anticipate that relevant marine DCO Works would start in the spring/summer, as this provides the most likely reliable working conditions for marine construction. However, the exact timing of the DCO Works will depend on when the TLSB Project construction commences and the approach the TLSB Tier One Contractors takes to scheduling DCO Works. All DCO Works will be in accordance with the agreed Construction Phasing scheme, DCO Requirement 3.
- 3.2.13 As a result, it is anticipated that the first AMRs will be produced in the first summer approximately 12 months after the start of marine construction. This may mean that the first AMR for a topic covers a period longer than 12 months (but less than 24 months), depending on the time of year when marine construction starts.
- 3.2.14 The first AMRs may also contain some baseline information, for example where a pre-construction commencement survey is required (e.g. multi-beam echosounder bathymetric surveys for CP2 and CP3). AMR production will also be staggered depending on the Objectives for a particular topic. For example, Coastal Birds CB2 covers surveillance of avian enhancement measures, which will only begin once they have been constructed, around the time the lagoon is operational. Appendix 5 indicates when the AMRs may be produced based on the survey timetable within the AEMP.

Annual Summary Report (ASR)

- 3.2.15 Each year, TLSB will produce an Annual Summary Report (ASR). The ASR will include:
- A summary of the findings and recommendations for each Objective for all topics;
 - Advice and recommendations from Topic Review Groups (TRGs); and

- Information on any Monitoring Action Sheets (see Section 3.7) raised or management actions taken during the year.

3.2.16 The first ASR will be produced after the first round of AMRs have been produced, in accordance with the AEMP timings as set out in draft in Appendix 6.

3.2.17 The ASR will form the basis of the decision-making processes of the Core Review Group (CRG).

3.3 Expectations of the Topic Review Groups (TRGs) and the Core Review Group (CRG)

3.3.1 The TRGs and CRG are the decision-making groups in the AEMP process. The purpose of the TRGs is to provide subject specific expertise in relation to Objectives, monitoring etc. This is communicated to the CRG primarily through the production of the AMRs and the ASR. The CRG is the decision-making body in relation to recommendations made by TRGs.

3.3.2 As such the members of these groups will need to represent their organisations and be empowered to speak for and make decisions on behalf of their organisation in relation to the group on which they sit. Members should have consulted colleagues prior to decision making meetings to ensure they can provide their organisation's position/advice and not only present the advice of the officer in attendance.

3.3.3 Members of the TRGs and CRG will be expected to:

- Represent their organisation as a whole in discussions and in making recommendations;
- Provide advice based on scientific evidence and principles by recognised experts in their field;
- Provide advice based on sound judgement and legal precedent;
- Share their knowledge and expertise on the latest developments in knowledge, technology and best practice associated with their field of expertise, where appropriate;
- Work to ensure that the AEMP process, evidence and monitoring requirements are proportional to the predicted and recorded impacts of the TLSB Project;
- Consider how best to utilise resources effectively, e.g. if it is appropriate for one party to take a lead role in a certain topic, or if existing monitoring can be used to inform other topics;
- Endeavour to meet the AEMP timescales for providing comments, approving minutes, confirming attendance at meetings, etc. and to attend annual meetings;
- Work with the other members of the Group in good faith to resolve as many issues as possible within the annual AEMP timescales;
- Consult with relevant colleagues prior to attending meetings/providing comments on monitoring reports so that a decision on required actions can be made;
- Not disseminate restricted access documents beyond the distribution list without the agreement of TLSB;
- To abide with any final decision made by the independent Chair on a way forward on any issues outstanding from the CRG; and
- Provide TLSB with an accurate record of the time spent on the AEMP review process to help inform the management and regular review of the process.

3.4 Topic Review Groups (TRGs)

Membership of the TRGs

3.4.1 Membership of the TRGs will be from the following organisations:

- NRW Advisory;
- City and County of Swansea Council (CCSC);
- Neath Port Talbot County Borough Council (NPTCBC);
- TLSB; and
- External expert advisors (as required).

3.4.2 Chair and Secretariat for all TRGs will be provided by TLSB. TLSB will provide email contact details as Secretariat to enable TRG members to contact the group as a whole and/or TLSB. The TLSB member of staff acting as Secretariat will not take part in any TRG decision making, or in making recommendations to the CRG.

3.4.3 Each organisation represented on the TRG will nominate a main representative to attend meetings, provide comments and contribute to decision making.

3.4.4 Each organisation will also nominate an alternate representative to attend meetings, etc. should the main representative not be available for any reason. Both the main representative and the alternate should have sufficient experience/expertise in the TRG topic to comment, discuss and contribute to any recommendations put forward to the CRG and be empowered to make decisions and represent their organisation as a whole in discussions on the topic.

3.4.5 TLSB will contact the relevant organisations for recommendations for members and alternates for a TRG. Organisations will be expected to respond within six weeks with their recommendations. The Secretariat will then issue the recommended list of members and act as a point of contact for all the TRG members. Should any organisation object to any member recommendation, a process of negotiation between all organisations not exceeding four weeks will take place in order to resolve any issues. All organisations have to agree to the members proposed, therefore if issues cannot be resolved within four weeks the organisation will be asked to provide an alternative recommendation.

3.4.6 Organisations can propose a different or alternate representative at any time (e.g. due to changes in representative's roles or members of staff leaving). Changes to members of the TRGs should be notified to the Secretariat as soon as possible, so that all members can be informed and that distribution lists can be kept up to date.

3.4.7 Time costs and expenses for TRG members only to attend meetings will be paid by TLSB. Costs for attendance at meetings and review of documents by specialists will only be provided on provision of evidence of expenditure on 'reasonable and proper costs' as stated under DCO Article 54 Part (2).

3.4.8 Representatives will be expected to have consulted relevant technical colleagues or others for advice prior to decision making meetings. Should a member organisation wish to have specific technical support at a meeting, this may be permitted under prior agreement with TLSB, however, costs for additional attendees will not be met by TLSB. Technical support may be in person or by remote means (e.g. telephone, Skype, etc.). Members should endeavor to keep the number of additional attendees at the meeting to a minimum and restrict support to specific technical matters/issues to be discussed.

- 3.4.9 The role of an external expert advisor on a TRG would be to ensure the interpretation of results/data analysis is accurately communicated to the TRG and that technical questions can be answered at the meeting or in response to the AMR. TLSB envisage that external advisors would be organisations contracted to carry out survey or analysis tasks, or potential suppliers of new technology providing information to the TRG in relation to a new methodology for surveying (e.g. remote survey technology, deterrent devices, etc.). External expert advisors would not take part in any TRG decision making.
- 3.4.10 The number of TRG members may vary depending upon the topic. However, a TRG should not exceed six permanent members (excluding the Chair). A TRG meeting must contain members (or a nominated alternate) from at least three out of four organisations for it to be declared quorate. Members may attend meetings in person or virtually (e.g. by video conference, Skype, or other remote facility, etc.).
- 3.4.11 All members/nominated alternates should make every effort to attend the TRG meeting. The meetings will take place at approximately the same time each year and dates will have been agreed in advance (see Appendix 6). If, after a meeting date has been agreed, a TRG member/alternate cannot attend they should make every effort to find another alternate and provide them with sufficient information to fulfil their role as a TRG member.
- 3.4.12 If, in exceptional circumstances, a TRG member cannot attend a meeting and cannot find a replacement representative (e.g. at very short notice), the TRG member should notify the Secretariat as soon as possible.
- 3.4.13 Where one organisation is unable to attend a meeting, the meeting will still go ahead, however, in the event that more than one TRG organisation cannot attend the meeting, the meeting will be rescheduled. The Secretariat will make every effort to reschedule the meeting as soon as possible.
- 3.4.14 TRG members should note that if a meeting does not go ahead it may have implications for the CRG meeting, as the CRG will be unable to act on any recommendations or proposed actions that the CRG should wish to put forward. If the TRG cannot meet before the CRG, then no changes to the monitoring will be proposed.
- 3.4.15 In the event that a TRG member fails to attend two consecutive meetings (even if the nominated alternate attends in their place) then the TRG member may be asked to leave the TRG by TLSB as Chair. If a TRG member does not abide by the expectations as set out in Section 3.3 then they may also be asked to leave by the Chair, following consultation with the other TRG members.
- 3.4.16 All members/nominated alternates will have read the relevant papers and made themselves aware of the AEMP process and the role of the TRG and its members, so that they can appropriately represent their organisation and fulfil the role of a TRG member, as set out above.
- 3.4.17 As a last resort, the Chair may ask the relevant Planning Authority to consider enforcement action against TRG organisations for non-compliance with the DCO in the event of repeated non-attendance by members or obvious consistent lack of preparation for meetings.

Role of the TRGs

- 3.4.18 The purpose of the TRGs is to provide subject specific expertise in relation to:

- The review of AEMP Objectives to ensure that monitoring is fit for purpose (e.g. methods are up to date, relevant and accurate, monitoring frequency, location and duration is appropriate to need);
- The review of any relevant trends in data;
- Whether an AEMP Objective or survey is still relevant (i.e. can it be discontinued);
- Providing recommendations to the CRG in relation to mitigation or management actions in response to impacts detected by the monitoring, including unforeseen impacts;
- Providing recommendations to the CRG for changes to the AEMP (e.g. frequency, location, duration, method of monitoring); and
- The review of Monitoring Action Sheet(s) (MAS) (see Section 3.7) that require an urgent decision (i.e. outside the normal annual reporting and meeting timescales).

3.4.19 Changes to the monitoring programmes, AEMP etc. can be done either through the Annual Review or the Substantive Review. The TRGs will comprise key technical specialists, across a range of environmental disciplines from relevant statutory authorities.

3.4.20 TLSB initially propose the establishment of following TRGs:

- Coastal Processes;
- Marine Ecology;
- Coastal Ecology;
- Fish;
- Birds; and
- Marine Mammals and Noise.

3.4.21 Monitoring related to those topics for which a TRG does not exist and is not considered necessary (e.g. water quality), will be reported directly to the CRG via the ASR.

3.4.22 In addition to recommendations made via the AMR and ASR on the AEMP itself, TRGs can also make recommendations to the CRG on the process, for example:

- The scheduling of TRG meetings in the year;
- The frequency of TRG meetings;
- The formation of a new TRG, if they believe one is required to address technical matters not covered by an existing TRG;
- The disbanding of a TRG, if they believe that there is no longer a need for a specific group; and
- The merging of two or more TRGs to create a new TRG. This might be considered as an alternative or 'halfway' to complete disbanding of a TRG. 'Merged' TRGs will have the same membership make up as other TRGs (see below).

3.4.23 The CRG will make decisions based on recommendations of the TRGs, as part of the annual CRG meeting (see Section 3.6).

3.4.24 TRGs will normally meet once a year to review the findings of the AEMP as presented in the AMR for their topic. TRGs will also be provided with relevant monitoring from other topics if there is a functional link (e.g. coastal processes monitoring data for the Coastal Ecology TRG).

- 3.4.25 TRG meetings will not take place at the same time as it is possible that some members may sit on more than one TRG. Meetings will therefore be 'staggered' throughout the year to ensure that there is sufficient time for members to adequately prepare for the meetings. However, to ensure that TRG meetings can be scheduled in advance, they will always take place at approximately the same time each year (see Appendix 6).
- 3.4.26 Relevant draft AMRs will be sent to the TRG members at least five weeks before the TRG meeting.
- 3.4.27 TRG members should review the draft AMRs and provide short written comments to the Secretariat two weeks before the TRG meeting. The Secretariat will circulate TRG members' comments to all relevant TRG members before the meeting, so that they can be taken into account during discussions at the meeting. TLSB will provide a feedback proforma for TRG members to assist them in submitting their comments in a standardised manner.
- 3.4.28 At the annual meeting, the TRG will review and discuss the monitoring results, analysis and recommendations, as set out in the draft AMR. The TRG will make recommendations to the CRG for any changes to monitoring, analysis, trigger levels, mitigation or management actions or other recommendations that they consider necessary, based on the results of the AEMP monitoring. The framework for decisions that the TRG can take is set out in the Objectives in the relevant topic of the AEMP.
- 3.4.29 Any revisions to the AMR will then be produced and the final AMR and completed comments proforma issued to all TRG members within three weeks of the TRG meeting. Should a disagreement arise at the meeting that is not resolved, this will be documented in the minutes and noted in the AMR. Should ongoing discussions during the following four weeks still result in disagreement, this will then carry through to the ASR and form part of the decision-making process of the CRG (see Section 3.5). Due to the staggering of TRGs throughout the year, it is acknowledged that for some topics there may be a longer time to resolve any disagreements. However, every effort should be made to stick to the timetable as set out due to potential knock-on effects regarding decisions of subsequent TRGs.
- 3.4.30 TRGs may also meet in the event that a Monitoring Action Sheet (MAS) is raised that requires an urgent decision (i.e. outside the normal annual reporting and meeting timescales). A MAS does not require the TRG to meet, only to make a decision based on the content and circumstances relating to the MAS. It will be for TRG members to decide if a meeting is required (see Section 3.7 for more detail on the MAS process).
- 3.4.31 Draft minutes and an action tracker of the TRG meeting will be produced by the Secretariat and circulated to members for approval approximately one week after the meeting. TRG members will then have two weeks to provide comments or feedback on the minutes. The minutes will also document any decisions taken or if any are pending. The final minutes will be appended to the AMR for that year to complete the audit trail. Figure 3.2 summarises the role of the TRG in the AEMP review process.

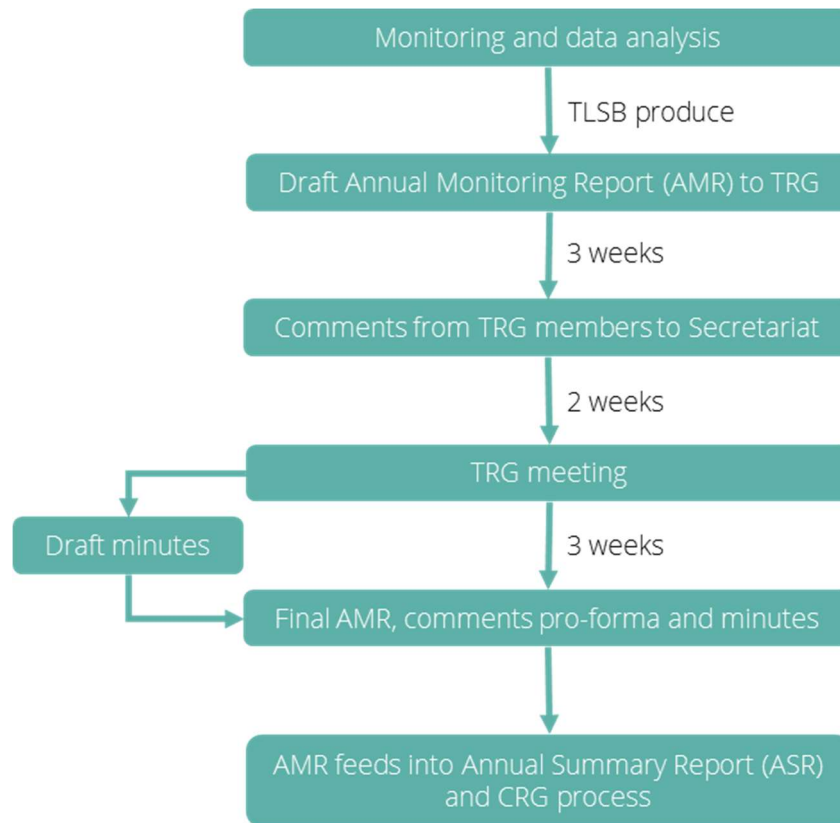


Figure 3.2 Role of TRG in AEMP review process

3.5 Core Review Group (CRG)

Membership of the CRG

3.5.1 Membership of the CRG, as set out in the DCO, will be from the following organisations which have a role in CRG decision making:

- NRW;
- City and County of Swansea Council (CCSC);
- Neath Port Talbot County Borough Council (NPTCBC);
- TLSB; and
- An independent Chair.

3.5.2 TLSB will act as Secretariat to the CRG. TLSB will provide email contact details as Secretariat to enable CRG members to contact the group as a whole and/or TLSB. The TLSB member of staff acting as Secretariat will not take part in any CRG decision making, or in making recommendations to the CRG.

3.5.3 The CRG will be officially established prior to the commencement of offshore construction works. It is anticipated that an inaugural meeting will be required prior to the issuing of any ASR to introduce members and discuss the membership of the Liaison Group (see Section 3.6).

3.5.4 Each organisation represented on the CRG will nominate a main representative to attend meetings, provide comments and contribute to decision making.

3.5.5 Each organisation will also nominate an alternate representative to attend meetings, etc. should the main representative not be available for any reason. Both the main

representative and the alternate should be empowered to make decisions and represent their organisation as a whole in discussions.

- 3.5.6 TLSB will contact the relevant organisations for recommendations for members and alternates for the CRG. Organisations will be expected to respond within six weeks with their recommendations. The Secretariat will then issue the recommended list of members and act as a point of contact for all the CRG members and the Chair (when appointed). Should any organisation object to any member recommendation, a process of negotiation between all organisations not exceeding four weeks will take place in order to resolve any issues. All organisations have to agree to the members proposed, therefore if issues cannot be resolved within four weeks the organisation will be asked to provide an alternative recommendation.
- 3.5.7 Organisations can propose a different representative/alternate representative at any time (e.g. due to changes in representative's roles or members of staff leaving). Changes to members of the CRG should be notified to the Secretariat as soon as possible, so that all members can be informed and that distribution lists can be kept up to date.
- 3.5.8 Time costs and expenses for CRG members (and the Chair) to attend meetings will be paid by TLSB. Costs for attendance at meetings and review of documents will only be provided on provision of evidence of expenditure on 'reasonable and proper costs' as stated under DCO Requirement 54 Part (2).
- 3.5.9 Representatives will be expected to have consulted relevant technical colleagues or others for advice prior to decision making meetings. Should a member organisation wish to have specific technical support at a meeting, this may be permitted under prior agreement with the Chair and TLSB, however, costs for additional attendees will not be met by TLSB. Technical support may be in person or by remote means (e.g. telephone, Skype, etc.). Members should endeavor to keep the number of additional attendees at the meeting to a minimum and restrict support to specific technical matters/issues to be discussed.
- 3.5.10 A CRG meeting must contain members (or a nominated alternate) from at least three out of four organisations and the appointed independent Chair for it to be declared quorate. Members may attend meetings in person or virtually (e.g. by video conference, Skype, etc.).
- 3.5.11 All members/nominated alternates should make every effort to attend the CRG meeting. The meetings will take place at approximately the same time each year and dates will have been agreed in advance. If, after a meeting date has been agreed, a CRG member/alternate cannot attend they should make every effort to find another alternate and provide them with sufficient information to fulfil their role as a CRG member.
- 3.5.12 If, in exceptional circumstances, a CRG member cannot attend a meeting and cannot find a replacement representative (e.g. at very short notice), the CRG member should notify the Secretariat as soon as possible.
- 3.5.13 Where one CRG member is unable to attend a meeting, the meeting will still go ahead, however, in the event that more than one CRG member, or the Chair, cannot attend the meeting, the meeting will be rescheduled. CRG members and the Secretariat will make every effort to reschedule the meeting as soon as possible.
- 3.5.14 In the event that a CRG member fails to attend two consecutive meetings (even if the nominated alternate attends in their place) then the CRG member may be asked to leave the CRG by the independent Chair. If a CRG member does not abide by the

expectations as set out in Section 3.3 then they may also be asked to leave by the independent Chair, following consultation with the other CRG members.

- 3.5.15 All members/nominated alternates will have read the relevant papers and made themselves aware of the AEMP process and the role of the CRG and its members, so that they can appropriately represent their organisation and fulfil the role of a CRG member, as set out above.
- 3.5.16 As a last resort, the Chair may ask the relevant Planning Authority to consider enforcement action against CRG organisations for non-compliance with the DCO in the event of repeated non-attendance by members or obvious consistent lack of preparation for meetings.

Chair of the CRG

- 3.5.17 The Chair of the CRG will be an independent person, selected by the CRG (DCO Requirement 6 Part (7)). The purpose of the Chair is to:
- Provide independent and objective guidance to the AEMP process and in particular to facilitate CRG meetings to reach agreement on decisions; and
 - To make a final decision in the event that the CRG cannot agree on a course of action.
- 3.5.18 Once appointed, members of the CRG will be invited to suggest potential candidates for consideration prior to the inaugural meeting of the CRG. The process of appointing a Chair should aim to take no more than three months.
- 3.5.19 The Chair of the CRG should be:
- Independent (i.e. not currently employed by/contracted to any of the organisations represented on the CRG, or have an interest in TLSB either as an investor or be likely to benefit personally from the TLSB Project);
 - Have a knowledge of regulatory compliance (e.g. have experience of marine licensing, planning, permitting as a regulator, policy maker, consultant, advisor, etc.);
 - Have a knowledge of the location (Swansea Bay, Severn Estuary or wider Bristol Channel); and
 - Have expertise or experience of marine and/or coastal environmental issues.
- 3.5.20 It will be for the CRG to decide on the relative importance of these factors and any other matters that they consider important in choosing a Chair.
- 3.5.21 The CRG should consider several options for a Chair, in case the chosen candidate is not available, does not wish to take up the role or has to change during the course of their tenure (e.g. for personal, professional or other reasons).
- 3.5.22 The CRG will decide on the Chair and a second choice by majority consensus. TLSB will contact the CRG's choice of Chair to invite them to take up the position.
- 3.5.23 When a CRG Chair stands down, the CRG members will suggest potential candidates for a replacement and invite the agreed potential Chair to take up the role, as per the process above.
- 3.5.24 The Chair will normally remain in the role for five years in order to complete one substantive review of the AEMP. A Chair can be re-selected by the CRG, if this is agreed through the Chair selection process set out above. A Chair may only hold the position for three terms, either consecutively or in total.

Role and responsibilities of the CRG

- 3.5.25 The CRG is the decision-making body in relation to recommendations to amend monitoring, or take management actions associated with the AEMP.
- 3.5.26 Any required changes to the monitoring programme and implementation or modification of measures required to deal with potentially detrimental environmental effects (as informed via the monitoring) will be approved through the AEMP review process.

- 3.5.27 The adaptive element of the AEMP framework also allows for the discussion and presentation of survey results, review and amendments of survey requirements and methodologies (as necessary) and ongoing consideration of whether objectives remain ‘fit for purpose’.
- 3.5.28 The CRG will have responsibility for and will make decisions regarding the following matters:
- Membership of the LG;
 - Recommendations contained within the Annual Summary Report (ASR) e.g. to amend monitoring programmes or objectives, or take management actions associated with the AEMP;
 - The number of TRGs and the frequency of TRG meetings;
 - Any disputes amongst TRG members;
 - The frequency of CRG meetings;
 - The membership of the CRG;
 - The overseeing the Substantive Reviews with respect to the AEMP process and implementing any resulting recommendations/actions; and
 - Any other matters regarding the AEMP that the CRG considers appropriate.
- 3.5.29 Decisions of the CRG will normally be informed by recommendations made by the TRGs and feedback from the Liaison Group (LG) (see Section 3.6). The CRG is, however, free to put forward areas for discussion and agreement without a recommendation (e.g. whether to create a new TRG for a topic area not covered by an existing TRG).
- 3.5.30 The CRG will normally meet once a year to review the findings of the AEMP as presented in the ASR. At this meeting it will consider the recommendations of the TRGs, review the minutes of the TRG meetings and consider any comments made by the LG. The CRG will then make any decisions necessary.
- 3.5.31 The ASR will be sent to the LG and CRG members at least eight weeks before the CRG meeting (see Appendix 6 for the AEMP review timings). Any comments received from the LG meeting will be included in the information provided to the CRG meeting.
- 3.5.32 CRG members should review the ASR and provide short written comments to the Secretariat two weeks before the CRG meeting. The Secretariat will circulate CRG members’ comments to all relevant CRG members before the meeting, so that they can be taken into account during discussions at the meeting. TLSB will provide a feedback proforma for CRG members to assist them in submitting their comments in a standardised manner.
- 3.5.33 Where recommendations are made for changes to the monitoring programme or for management action to be taken, these will be considered by the CRG and an agreed decision by majority vote taken by those present at the meeting or within four weeks of the meeting date.
- 3.5.34 Only CRG members (or their alternates) and the Chair have a role in the decision-making process. Any additional attendees at the meeting and the Secretariat will not take part in decision making.
- 3.5.35 Should the CRG be unable to come to a decision within four weeks of the meeting a final decision will be taken by the independent Chair of the CRG within six weeks of the meeting date (e.g. to rule in favour of one party, to make a different decision or to seek external advice). In this case, the independent Chair acts as the Arbitrator for the AEMP in line with DCO Requirement 50. In making a decision, the Chair will provide

reasoning for the decision, including how information presented to the CGR, the views of CRG members, the LG and any other relevant information has informed their decision. Should any CRG member disagree with the Chair's final decision, then the Arbitration process as outlined in DCO Requirement 50 is followed, which ultimately hands the decision to the relevant Secretary of State.

- 3.5.36 The same decision-making process is followed for any disagreements that arise within the TRGs that are brought to the CRG.
- 3.5.37 Within six weeks of the CRG meeting, TLSB will produce an addendum to the ASR summarising information on any decisions taken by the CRG (e.g. any monitoring amendments and agreed implementation of mitigation) and any outstanding decisions pending Arbitration.
- 3.5.38 Any changes to Objectives, Surveys or Method Statements that are needed as a result of CRG decisions contained within the ASR Addendum will be drafted by TLSB and provided to the relevant TRG for comment within four weeks of the ASR Addendum release. The CRG will seek advice where necessary as to whether the changes will require the re-submission of the AEMP for approval. Members will normally be requested to provide comments within 6 weeks of receiving draft revisions. Any comments that TRG members provide should take account of the original recommendations and decision(s) taken by the CRG regarding the changes. TLSB will finalise changes within 2 weeks of receiving comments from TRG members. Figure 3.3 summarises the role of the CRG in the AEMP review process.



Figure 3.3 Summary of the CRG role in the AEMP review process.

3.5.39 Draft minutes of the CRG meeting will be produced by the Secretariat and circulated to members for approval approximately one week after the meeting. CRG members will then have two weeks to provide comments on the minutes. The minutes will also document any decisions taken or if any are pending. The final minutes will be appended to the ASR for that year to complete the audit trail.

3.6 Liaison Group (LG)

Membership and role of the LG

- 3.6.1 The Liaison Group (LG) will provide a mechanism for relevant local stakeholders to review the results of monitoring through the ASR and provide comments to the CRG for consideration in their decision making.
- 3.6.2 The LG will be made up of relevant non-statutory consultees and interested parties, such as wildlife or recreation groups. Members will be encouraged to comment on behalf of all their members and not just represent individual views.
- 3.6.3 The CRG will invite potential members to sit on the LG. The CRG will endeavour to ensure the LG membership is balanced and does not over or under-represent any particular group or issue. In the event that an LG member is not able to sit on the group, or chooses to leave, the CRG will invite a replacement to take their place. In selecting the replacement LG member the CRG should consider any suggestions made by the outgoing LG member, along with other matters such as maintaining a balanced membership of the LG. The Secretariat (TLSB) will manage the invitation process on behalf of the CRG. Membership of the LG will be limited to a maximum of 10 representatives.
- 3.6.4 The ASR will be circulated to LG members for information and comment at the same time it is issued to the CRG (i.e. eight weeks prior to the CRG meeting). LG members should review the ASR and provide short written comments to the Secretariat within four weeks of issue and two weeks before the LG meeting. The Secretariat will circulate members' comments to all LG members before the meeting, so that they can be taken into account during discussions at the meeting. TLSB will provide a feedback proforma for LG members to assist them in submitting their comments in a standardised manner.
- 3.6.5 The annual LG meeting will be held six weeks after the ASR has been issued to discuss and finalise any comments.
- 3.6.6 Draft minutes of the LG meeting and the final comments will be produced by the Secretariat and circulated to members for approval approximately one week after the LG meeting. At the same time, the documents will be passed to the CRG. Members will then have two weeks to provide feedback on the minutes. The final minutes will form part of the publicly available information for that year to complete the audit trail.
- 3.6.7 Draft minutes from the LG meeting and the final comments proforma will be circulated to the CRG members prior to the CRG meeting. The CRG will consider any comments made by the LG at their annual meeting. The CRG plays no role as Arbitrator in any dispute between LG members. Disagreements will be noted in the minutes that are passed onto CRG. Figure 3.4 summarises the LG process.

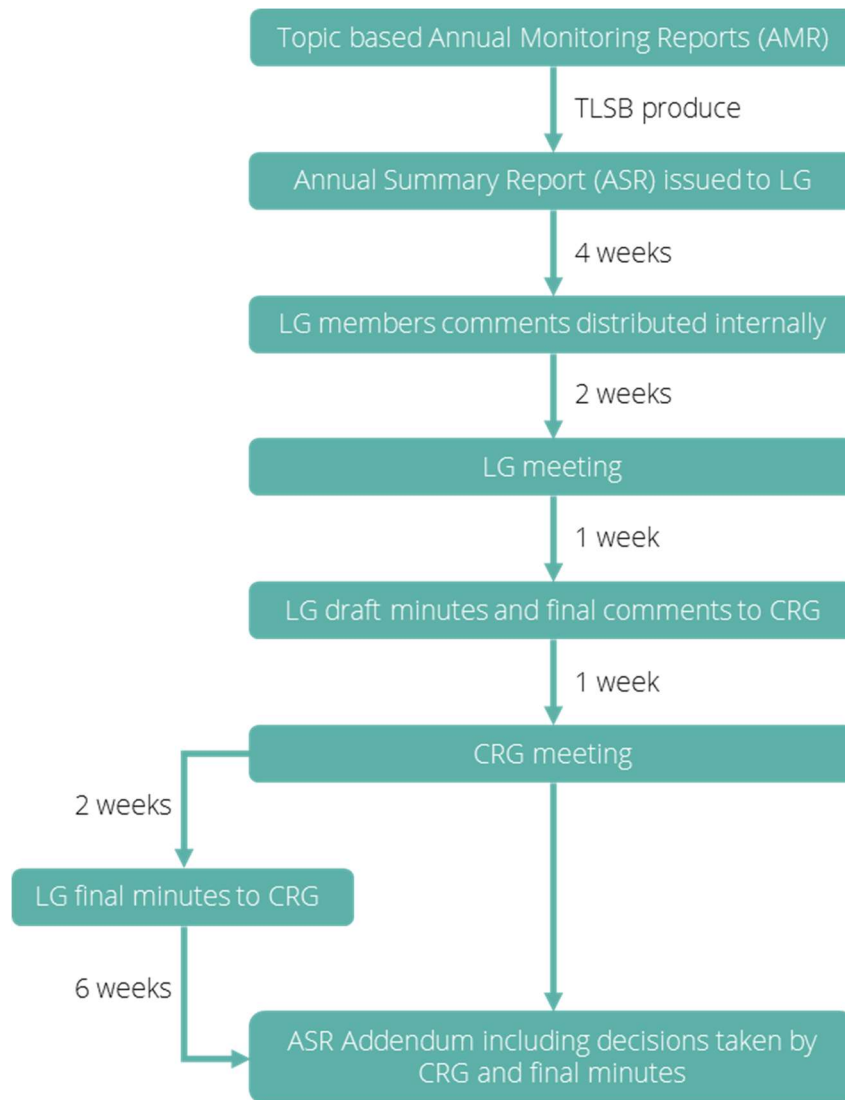


Figure 3.4 Summary of LG role in AEMP review process.

3.7 Monitoring Action Sheet (MAS) Process

- 3.7.1 The Monitoring Action Sheet (MAS) process is designed to be implemented in the event that significant environmental changes outside those predicted or expected are recorded. The process notifies members of the relevant TRGs to the change so that a decision can be made about what action, if any, should be taken in response to the change. Individual Objectives set out the decision-making framework for the MAS process relevant to that Objective.
- 3.7.2 The process for determining the most likely cause of the change will normally involve reviewing the monitoring data for the objective in question, along with data from other objectives, data specifically collected in response to the change, or other non-AEMP sources (e.g. WFD data, weather data).
- 3.7.3 The MAS will outline the data review undertaken in order to establish a link between the significant adverse change and the TLSB Project. If no direct link can be found (e.g. a severe storm eroding the sand dunes of Crymlyn Burrows Site of Special Scientific Interest (SSSI) is not a result of the TLSB Project operation) then this will be recorded, the MAS sent to the TRG and no further action under the AEMP is required. However, should a direct link be determined, then TLSB will issue the MAS to the

relevant TRG members as soon as possible (at most within two weeks of becoming aware of a potential significant environmental change).

- 3.7.4 In the event that the TRG member for an organisation is not available (e.g. out of office message in response to MAS), TLSB will forward the MAS and any other relevant information to their nominated alternate. In the event that the alternate is not available, TLSB will forward the information to the CRG representative for that organisation. In the event that the CRG representative is not available, TLSB will make every effort to contact another relevant person in the organisation to act as representative in the MAS process.
- 3.7.5 When TLSB circulates the MAS to TRG members, a deadline for a response from the members will be indicated. As the MAS process will only be implemented in the event of a significant change linked to the TLSB Project, swift and timely responses from TRG members will be crucial to reduce the risk of any adverse impact from the change (whatever the cause).
- 3.7.6 If considered necessary by TRG members, a meeting to discuss and agree the most appropriate action in response to the MAS event will be held. The Secretariat will make arrangements for the MAS review meeting.
- 3.7.7 The procedures and requirements for attendance at TRG meetings in response to an MAS are the same as for regular TRG meetings (see Section 3.4). However, given the more likely requirement for an urgent decision to be needed in response to a MAS, a virtual meeting (telephone conference, Skype, video conference, etc.) or agreement for immediate action by email may be necessary.
- 3.7.8 In the event that a TRG meeting in response to a MAS is cancelled or cannot be held due to more than one member being unable to attend, or that agreement among TRG members on the action to be taken cannot be reached, the status quo will prevail (i.e. existing management/monitoring will continue).
- 3.7.9 Decisions made in response to a MAS, actions taken and any responses to those actions will be included in the next AMR and integrated into the normal AEMP review process.
- 3.7.10 The MAS process is specifically triggered by unexpected events or environmental changes. Where trigger levels are breached during the normal reporting cycle these will be reported and dealt with as part of that cycle.

3.8 AEMP Substantive Review

- 3.8.1 As set out in Section 3.2, the purpose of the Substantive Review overseen by the CRG is to assess the AEMP process as a whole to ensure that it is working in the most effective and efficient way possible for all parties.
- 3.8.2 The first Substantive Review should take place after five Annual Reviews have taken place, with subsequent Substantive Reviews taking place every five years after this. Over time, as the AEMP process becomes established and uncertainty regarding TLSB Project operation, monitoring and potential change reduces, the need to review the process every five years could reduce and it may be more appropriate to hold a Substantive Review less frequently. Each Substantive Review should include a consideration of when the next Substantive Review should take place, with the default being after five years.
- 3.8.3 TLSB will be responsible for carrying out the Substantive Review and producing a report on the review. TLSB may carry out the review in-house, or contract the review to an independent external consultant. The Substantive Review report will be

presented to the CRG at a separate meeting dedicated to this purpose. Recommendations for the AEMP process will be considered, with the CRG taking the final decisions on any changes.

3.8.4 The Substantive Review will look at, but not be restricted to, the following matters:

- The effectiveness of individual TRGs, the LG and the CRG in decision making, consultation and liaison (including any disputes and their resolution);
- The Annual Review Process, including reporting timelines, scheduling of meetings, number and membership of TRGs, CRG, LG);
- A review of the decisions taken by the TRGs and CRG in the previous five years and the outcomes of those decisions;
- Report formats, length, content, etc., including feedback proformas, recording of decision making, taking of minutes;
- How well the document control process (Section 3.9) is working, accessibility of information for TRG, CRG and LG members, what information should be made publicly available, etc.; and
- Seek specific feedback from the TRGs, CRG and LG on the AEMP process, gathered for the purpose of the Substantive Review.

3.8.5 Advice will be taken at the time as to whether any changes will require the submission and approval of an amended AEMP.

3.9 Document Control

3.9.1 TLSB will be responsible for maintaining all relevant AEMP documents over the life of the TLSB Project, including:

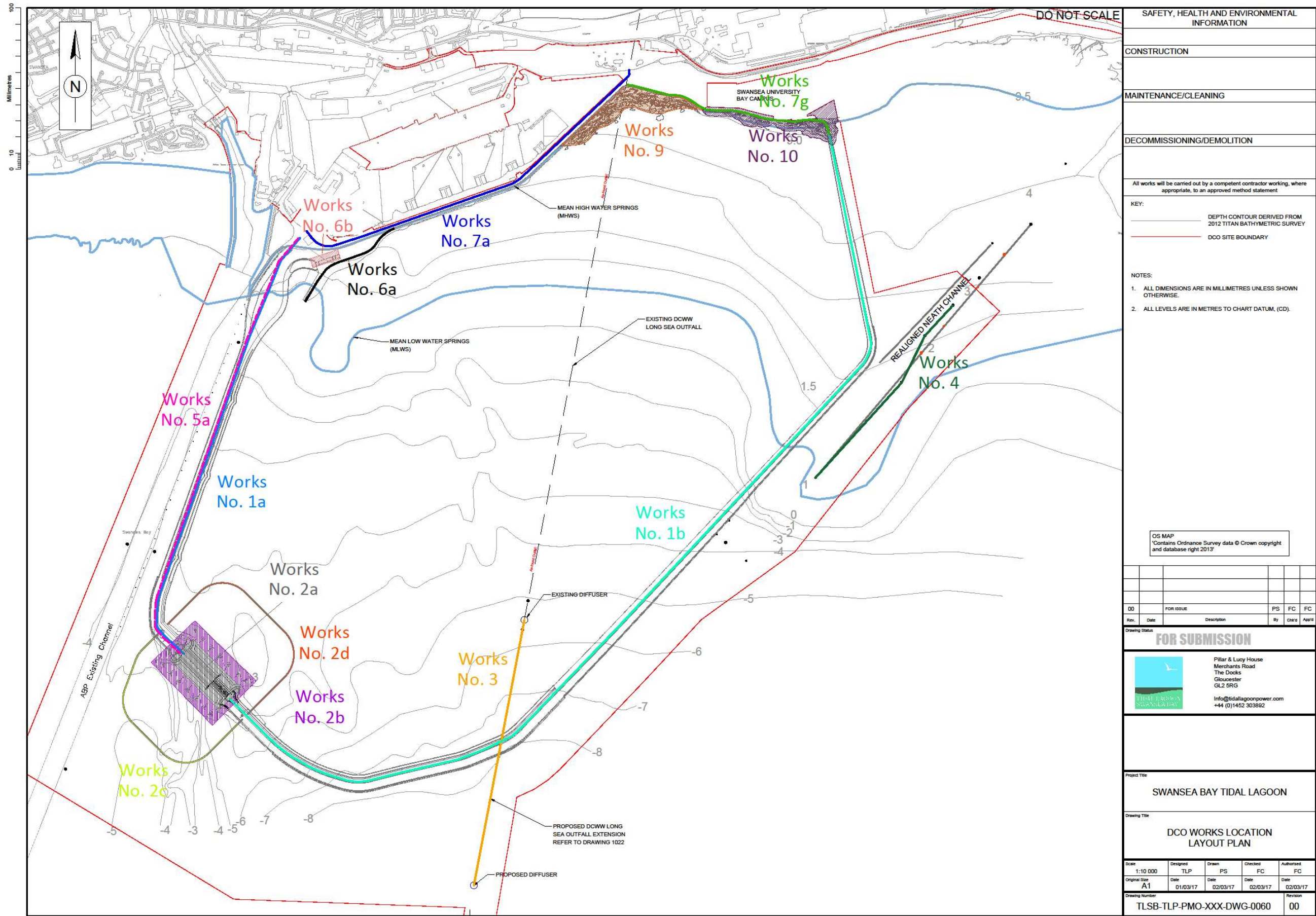
- A full, approved up to date version of the AEMP, including Objectives, Surveys and Method Statements;
- A record of agreed changes to the AEMP;
- Annual Monitoring Reports (AMRs);
- Annual Summary Reports (ASRs);
- Minutes of all TRG, LG and CRG meetings;
- Monitoring Action Sheets (MAS) raised and a record of any meetings, decisions or actions made in response to the MAS;
- Substantive Review process reports and decisions made in response to the substantive review process;
- Documents and information relating to the AEMP document control procedures;
- All survey reports and data; and
- Any other documents relevant to the AEMP.

3.9.2 Copies of relevant documents will be circulated, or made available to the members of the TRG, CRG and LG, as appropriate and in accordance with the procedures set out in the AEMP, particularly the annual and substantive review processes.

3.9.3 Dissemination of documents or access to AEMP documents may be electronically (e.g. by email, document download service) or via a virtual shared document library. Access to some AEMP documents (e.g. draft documents for comment/agreement) will be restricted to members of TRGs and the CRG (e.g. by restricted email distribution, password protected file download service, members area of a website, etc.). TRG, CRG and LG members should not disseminate restricted access documents beyond the distribution list without prior agreement of TLSB.

- 3.9.4 Unless in draft for comment, all electronic documents will be made available in a non-editable format to ensure that document control is maintained by TLSB.
- 3.9.5 TLSB will also be responsible for maintaining an archive of documents in electronic form until such time that they are deemed obsolete.
- 3.9.6 TLSB will make final versions of the AEMP, AMRs, ASRs and minutes of TRG and CRG meetings publicly available via an appropriate web-based system.

Appendix 1: DCO Works location plan



Appendix 2: DCO Works sequence of construction

		Construction Year One				Construction Year Two				Construction Year Three				Construction Year Four				Construction Year Five				Construction Year Six			
DCO Work Description Summary* (see Phasing Scheme for full details)	DCO Work No.	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
New internal access road comprising 2 carriageways with a fence	7a																								
Temporary construction works	8(a)																								
Landscaping elements of Parks & works to existing wave protection wall	8(b)																								
Bunds, embankments, swales, landscaping & boundary treatments & fencing;	8(e)																								
Demolition of buildings as shown on demolition plan	8(f)																								
Provision of footpaths;	8(g)																								
Lighting columns and lighting;	8(h)																								
Safety/emergency points.	8(i)																								
Navigational aids	8(d)																								
Navigational aids, warning or ship impact protection works;	10(f)																								
Western Wall	1a																								
Eastern Seawall	1b																								
Viewing areas	1a,1b,2a (a)																								
Siting locations for works of public art	1a,1b,2a (b)																								
Construction of a jetty and floating pontoons and piles or dolphins	6a																								
Temporary sediment berm cofferdam	2b																								
Seaward safety zone including upto 15 dolphin piles	2c																								
Landward safety zone	2d																								
Buried pipeline extension of the existsing long sea sewerage outfall	3																								
New eastern channel training wall in the River Neath	4																								
New access track at eastern seawal landfall	7g																								
Means of accommodating vessels during construction	10(g)																								
Works to alter the position of apparatus on, over or under tidal waters or tidal lands	10(h)																								
Turbine and Sluice Gate Housing	2a																								
Dividing structures and wingwalls	2a(d)																								
Low voltage substation	1a(a)																								
275kV grid connection	5a																								
Installation of services along eastern and western seawalls	10(e)																								
Extension of the existing surface drainage outfalls serving Fabian Way	10(c)																								
Switch room	2a(a)																								
Scour protection	2a(b)																								
Saltmarsh habitat area & coastal grassland habitat area	9																								
New coastal grassland and dune area	10																								
A beach area	10(a)																								
Associated electrical equipmet and transformers	2a(c)																								
External gantry cranes & infrastructure for operating the turbines & sluices	2a(e)																								
Construction of onshore operation and maintenance facilities	6b(a)(i-vi)																								
(i) parking spaces for O&M (ii)emergency access facilities	6b(b)(i-ii)																								
Oyster spatting ponds	10(d)																								
O&M facilities and pilings to enable construction of offshore buliding	1a(e)																								
Visitor/information point to serve Crymlyn Burrows SSSI	10(b)																								
Provision of and for lighting	1a(b)																								
Slipways, jetties and access points	1a(c)																								
Landscaped area where the seawall makes landfall	1a(d)																								
Habitat creation (including mariculture)	8(c)																								

* The sequence outlined above shows the earliest phase the construction of a particular DCO Work will commence (assuming all relevant DCO Requirements are approved). DCO Works may commence later than the phase shown.

Appendix 3: Matrix to show the interaction of Objectives

Objectives	CP1	CP2	CP3	CP4	CP5	CP6	CP7	WQ1	WQ2	WQ3	ME1	ME2	ME3	ME4	ME5	ME6	ME7	F1	F2	F3	F4	MM1	MM2	CB1	CB2	CE1	CE2	CE3	CE4	CE5	CE6	N1
CP1																																
CP2																																
CP3																																
CP4																																
CP5																																
CP6																																
CP7																																
WQ1																																
WQ2																																
WQ3																																
ME1																																
ME2																																
ME3																																
ME4																																
ME5																																
ME6																																
ME7																																
F1																																
F2																																
F3																																
F4																																
MM1																																
MM2																																
CB1																																
CB2																																
CE1																																
CE2																																
CE3																																
CE4																																
CE5																																
CE6																																
N1																																

Appendix 4: Matrix to show the interaction of Objectives with Surveys

Survey	Objective	CP-S1	CP-S2	CP-S3	CP-S4	CP-S5	CP-S6	CP-S7	CP-S8	CP-S9	CP-S10	WQ-S1	WQ-S2	WQ-S3	WQ-S4	ME-S1	ME-S2	ME-S3	ME-S4	ME-S5	ME-S6	ME-S7	ME-S8	F-S1	F-S2	F-S3	FS-4	F-S5	F-S6	F-S7	F-S8	MM-S1	MM-S2	CB-S1	CB-S2	CE-S1	CE-S2	CE-S3	CE-S4	CE-S5	CE-S6	N-S1	N-S2		
	CP1																																												
	CP2																																												
	CP3																																												
	CP4																																												
	CP5																																												
	CP6																																												
	CP7																																												
	WQ1																																												
	WQ2																																												
	WQ3																																												
	ME1																																												
	ME2																																												
	ME3																																												
	ME4																																												
	ME5																																												
	ME6																																												
	ME7																																												
	F1																																												
	F2																																												
	F3																																												
	F4																																												
	MM1																																												
	MM2																																												
	CB1																																												
	CB2																																												
	CE1																																												
	CE2																																												
	CE3																																												
	CE4																																												
	CE5																																												
	CE6																																												
	N1																																												

Appendix 5: Survey timetable

Objective	Survey	Pre-construction	Construction				Operation				
			1	2	3	4	1	2	3	4	5
Coastal Processes											
CP1	CP-S1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CP-S2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CP-S3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CP-S4	✓			✓		✓				✓
CP2	CP-S5	✓			✓		✓				✓
CP3	CP-S6				✓		✓				✓
	CP-S7						✓				
CP4	CP-S8						✓				
CP5	CP-S9						✓				
CP6	CP-S10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CP7	none										
Water Quality											
WQ1	WQ-S1						✓				
	WQ-S2						✓				
WQ2	WQ-S3	✓	✓	✓	✓	✓	✓	✓			
	WQ-S4						✓	✓			
WQ3	none										
Marine Ecology											
ME1	ME-S1	✓	✓	✓	✓	✓	✓	✓	✓		
	ME-S2	✓	✓	✓	✓	✓	✓	✓	✓		
ME2	ME-S3	✓					✓				✓
ME3	ME-S4	✓					✓				✓
ME4	ME-S5	✓	✓	✓	✓	✓	✓	✓	✓		
	ME-S6	✓	✓	✓	✓	✓	✓	✓	✓		
	ME-S7	✓						✓			
ME5	none										
ME6	none										
ME7	ME-S8						TBC				
Fish											
F1	F-S1						TBC				
	F-S2						TBC				
	F-S3						TBC				
F2	F-S4						TBC				
	F-S5						TBC				
	F-S6 none										
F3	F-S7 none										
F4	F-S8										
Marine Mammals											
MM1	MM-S1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MM2	MM-S2						✓	✓	✓	✓	✓
Coastal Birds											
CB1	CB-S1		✓		✓		✓	✓	✓	✓	✓
CB2	CB-S2						✓	✓	✓	✓	✓
Coastal Ecology											
CE1	CE-S1	prior to 1) western and 2) eastern breakwater construction					✓		✓		✓
CE2	CE-S2	✓									
CE3	CE-S4						✓		✓		✓
	CE-S5						✓		✓		✓
	CE-S6										✓
	CE-S7						✓		✓		✓
CE4	none										
CE5	CE-S8	✓					✓		✓		✓
CE6	CE-S9	✓					✓		✓		✓
Noise											
N1	S40		dependant on construction activities								
	S41						✓				

Appendix 6: Annual AEMP process timeline

Year 1	week 27	JULY																	
	week 28																		
	week 29		Coastal Processes draft AMR																
	week 30																		
	week 31	AUGUST																	
	week 32		Marine Mammals & Noise draft AMR	TRG comments															
	week 33		Fish draft AMR																
	week 34				CP TRG														
	week 35			TRG comments															
	week 36	SEPT		TRG comments															
	week 37					MM & N TRG	CP final AMR												
	week 38		Birds draft AMR			F TRG													
	week 39																		
	week 40	OCT	Marine Ecology draft AMR				MM & N final AMR												
	week 41			TRG comments			F final AMR												
	week 42		Coastal Ecology draft AMR																
	week 43			TRG comments		B TRG													
	week 44	NOV																	
	week 45			TRG comments		ME TRG													
	week 46						B final AMR												
	week 47					CE TRG													
	week 48	DEC					ME final AMR												
	week 49																		
	week 50						CE final AMR												
	week 51																		
	week 52																		
Year 2	week 1	JANUARY					ASR to CRG	ASR to LG											
	week 2																		
	week 3																		
	week 4																		
	week 5	FEBRUARY						LG comments											
	week 6																		
	week 7						CRG comments		LG meeting										
	week 8										LG draft minutes and final comments to CRG								

KEY			
CP: Coastal Processes			
MM & N: Marine Mammals & Noise			
F: Fish			
B: Birds			
ME: Marine Ecology			
CE: Coastal Ecology			
Core Review Group			
Liaison Group			
ASR: Annual Summary Report			
AEMP amendment process			
AMR: Annual Monitoring Report			

	week 9	MARCH								CRG meeting						
	week 10										CRG draft minutes					
	week 11											LG final minutes to CRG				
	week 12											CRG minutes comments				
	week 13															
	week 14	APRIL														
	week 15												ASR addendum and final CRG minutes			
	week 16															
	week 17															
	week 18	MAY														
	week 19													draft changes to AEMP issued to TRG and CRG		
	week 20															
	week 21															
	week 22															
	week 23	JUNE														
	week 24															
	week 25														comments received	
	week 26	JULY														
	week 27															final AEMP
	week 28															
	week 29		Coastal Processes draft AMR													
	week 30	AUGUST														
	week 31															
	week 32		Marine Mammals & Noise draft AMR	TRG comments												
	week 33		Fish draft AMR													
	week 34				CP TRG											
	week 35			TRG comments												
	week 36	SEPT		TRG comments												
	week 37				MM & N TRG	CP final AMR										
	week 38		Birds draft AMR		F TRG											
	week 39															

	week 40	OCT	Marine Ecology draft AMR			MM & N final AMR										
	week 41			TRG comments		F final AMR										
	week 42		Coastal Ecology draft AMR													
	week 43			TRG comments	B TRG											
	week 44	NOV														
	week 45			TRG comments	ME TRG											
	week 46					B final AMR										
	week 47				CETRG											
	week 48	DEC				ME final AMR										
	week 49															
	week 50					CE final AMR										
	week 51															
	week 52															