



North Sea
Transition
Authority

Overview of the Carbon Storage Permit Application Process

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Glossary of terms

Abbreviation	Definition
2020 EIA Regulations	The Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020
CMP	Corrective Measures Plan
CRA	Containment Risk Assessment
CS Disclosure Regulations	Carbon Storage and Offshore Petroleum) (Specified Periods for Disclosure of Protected Material) Regulations 2026
CSDP	Carbon Storage Development Plan
CS Retention Regulations	Oil and Gas Authority (Carbon Storage) (Retention of Information and Samples) Regulations 2025
Directive	Directive 2009/31/EC of the European Parliament and of the Council on geological storage of carbon dioxide
EIA	Environment Impact Assessment
ERA	Early Risk Assessment
ES	Environmental statement
MP	Monitoring Plan
PEP	Project Execution Plan
PPCP	Provisional Post-Closure Plan
SCAP	Supply Chain Action Plan
SCRR	Site Characterisation Review Report
SI	Significant irregularity
SSCC	Storage Site and Complex Characterisation
Storage Operator	Carbon Storage Permit Operator
Storage Regulations	The Storage of Carbon Dioxide (Licensing etc.) Regulations 2010
T&SCo	Transport and storage company
Termination Regulations	The Storage of Carbon Dioxide (Termination of Licences) Regulations 2011
TRL	Technology readiness level

Introduction

1. The NSTA¹ is the licensing authority for carbon dioxide storage in an offshore UK controlled place or English controlled place (as set out in the Energy Act 2008), granting Carbon Dioxide Appraisal and Storage Licences ('CS licence') and Storage Permits.
2. Anyone who wishes to explore for or use a geological feature for the long-term storage of carbon dioxide ('carbon storage') in a UK offshore area must hold a CS licence², pursuant to section 18 of the Energy Act 2008³ (the 'Act'), issued by the NSTA. A CS licence is required to apply for a Permit.
3. A Storage Permit ('Permit') may be applied for and is required for the storage of carbon dioxide in a storage site with a view to its permanent containment during the operational phase of the CS licence and beyond. The CS licence will expire at the end of the appraisal/initial term if an application for a Permit is not made before that date, or if the Permit is not granted. The holder of the CS licence, the Licensee is, therefore, referred to in this guidance in that context (and is expected to be the entity making the Storage Permit Application).
4. To apply for a Permit, a Licensee must submit a Storage Permit Application to the NSTA. The Storage Permit Application is made up of seven documents, which must fulfil the requirements of The Storage of Carbon Dioxide (Licensing etc.) Regulations 2010⁴ (the 'Storage Regulations'), and which are outlined in this document with further detail provided in the Detailed Guidance on the Carbon Storage Permit Application Process⁵ ('Detailed Guidance'). A CS licence will expire at the end of the appraisal/initial term if a Storage Permit Application is not made before that date or if the Storage Permit Application is refused by the NSTA.
5. From the point of issue of a CS licence until receipt of a valid Storage Permit Application, the Licensee must complete the work programme set out in its CS licence. Before granting a Permit, the NSTA must be satisfied of certain matters in accordance with

¹ The Oil and Gas Authority ('OGA') is now operating as the North Sea Transition Authority ('NSTA') and will be referred to as the NSTA in this document. The OGA remains the legal name of the company, and all licences and other legal documentation will continue to refer to the OGA.

² [Guidance on the Application for a Carbon Dioxide Appraisal and Storage Licence](#)

³ [Energy Act 2008 \(legislation.gov.uk\)](#)

⁴ [The Storage of Carbon Dioxide \(Licensing etc.\) Regulations 2010 \(legislation.gov.uk\)](#)

⁵ [Detailed Guidance on the Carbon Storage Permit Application Process](#)

regulations 6 and 7 of the Storage Regulations. These include, but are not limited to:

- i. The storage complex and surrounding area have been sufficiently characterised and assessed in accordance with the criteria set out in Annex I to the Directive 2009/31/EC of the European Parliament and of the Council⁶ (the 'Directive')
- ii. No part of the storage complex extends beyond the territory of the United Kingdom
- iii. Under the proposed conditions of use of the storage site', there is no significant risk of leakage or of harm to the environment or human health
- iv. A Monitoring Plan ('MP'), Corrective Measures Plan ('CMP') and Provisional Post-Closure Plan

('PPCP') have been drawn up (see also Detailed Guidance)

- v. The proposed operator is technically competent (including in the operation of environmental management systems), financially sound, and can be relied upon to carry out the functions of an operator; and
 - vi. The proposed operator has in place an appropriate programme of professional and technical development and training
6. The Licensee should liaise with any other regulators or bodies in order to obtain all the necessary consents, authorisations, approvals, and other requirements to enable it to undertake carbon storage operations as proposed in its Storage Permit Application.

Scope and purpose of this guidance

7. This guidance provides a high-level overview of the process leading to a Storage Permit Application following the award of a CS licence. More details on the content of the various documents that are required can be found in the Detailed Guidance.
8. A CS licence is required for the whole duration of a carbon storage

development and covers three distinct terms each consisting of multiple phases leading to the termination of the CS licence and the Post-Transfer Period (Figure 1):

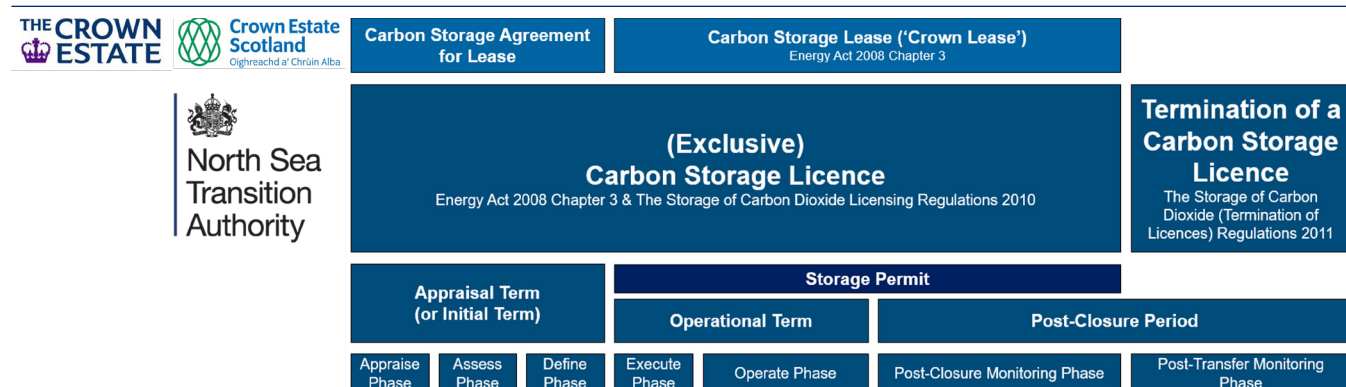
- **Initial or Appraisal Term** – the period during which evaluation of the potential for a storage project and/or an application for a Permit

⁶ Directive 2009/31/EC of the European Parliament and of the Council

is made. Note that where there is a work programme in place then this term will be the 'Appraisal Term', and where there is no such work programme it will be the 'initial term'. The Initial or Appraisal Term consists of three discrete phases – **appraise, assess and define** – with Storage Permit Application during the Define Phase. The initial or Appraisal Term ends with either the grant of a Permit (if applied for) or the expiry of the CS licence, either because is no Storage Permit Application is submitted or because an application is submitted but a Permit not granted.

- **Operational Term** – the period beginning with the date on which the Permit is granted and ending with the closure of the storage site. The Operational Term consists of the execute and operate phases.
- **Post-Closure Period** – the period beginning immediately after the closure of the storage site and continuing until the termination of the CS licence, a period of no less than 20 years from date of closure of the storage site, outlined in The Storage of Carbon Dioxide (Termination of Licences) Regulations 2011 (the 'Termination Regulations')⁷. The post-closure period consists of the post-closure monitoring phase where the Carbon Storage Permit Operator ('Storage Operator')⁸ is still responsible for monitoring the store.
- **Post-Transfer Period** – the period after the CS licence is terminated and transferred to government, which involves a financial contribution to be paid by the Storage Operator to cover at least the anticipated cost of monitoring for a subsequent period of 30 years.

Figure 1: Main terms and phases in a CS licence. The Licensee is responsible for obtaining all necessary approvals and agreements, including from the Crown Estate or Crown Estate Scotland.



⁷ The Storage of Carbon Dioxide (Termination of Licences) Regulations 2011 (legislation.gov.uk)

⁸ This role has a meaning specific to carbon storage activity and is defined in the Storage Regulations as meaning "...the person who carries on or (where different) controls activities at the storage site".

9. This document is intended to assist those involved in the planning of a carbon storage development and the application process for a Permit which, if granted, gives the Licensee consent to the injection of CO₂ into a suitable underground geological formation in the UK Continental Shelf ('UKCS'). This guidance covers the initial or Appraisal Term of a CS licence and details the following:
 - An overview of the NSTA's objectives and considerations relevant to all new Storage Permit Applications and developments
 - The requirements at each phase of the Appraisal Term
 - The process of notification and implementation of changes for an existing Permit
 - A brief outline of the Execute Phase of the Operational Term when infrastructure is put in place or repurposed, wells drilled, early Permit obligations are met and the project prepared for the safe injection of CO₂ in the subsequent operate phase
10. The Appraisal Term of a CS licence comprises three phases:
 - The Appraise Phase which includes the delivery and review of an Early Risk Assessment and Site Characterisation Review. For CS licences with an Appraisal Term, there may also be the requirement for geological evaluation through exploration/appraisal of the store
 - The Assess Phase which is to fully assess and characterise the storage site and complex, mature the risk assessment, consider monitoring and corrective measures and demonstrate that the CO₂ transportation and facilities concept and development has been selected by the Licensee
 - The Define Phase which is to fully mature the storage project, with all technical work and financial security completed. The Storage Permit Application and the application for Storage Operator are submitted during the Define Phase
11. For each phase, the Licensee must submit a report or series of reports to the NSTA for review (Figure 2), submit a plan for the next phase or stage of work and attend a review meeting. Once the NSTA is satisfied the requirements have been met the Licensee will be informed, and the CS licence will progress to the next phase.

Figure 2: Permit road map showing the main deliverables for each licence phase, events marking each phase transition and cross-regulator requirements

		APPRAISE PHASE	ASSESS PHASE	DEFINE PHASE	EXECUTE
		Early risk assessment, site characterisation, data suitability, storage site suitability for CO ₂ storage and injection facilities	Full characterisation of storage site and complex, preliminary CO ₂ transportation and injection facilities development plan	Fully optimised development plan, detailed implementation plans, and Storage Permit Application	Build the development, finalise the operating plan
INDUSTRY REQUIREMENTS	NSTA	• Early Risk Assessment Report • Early Risk Assessment Workshop • Further Risk Reduction Measures • Firm/Contingent appraisal activity • Site Characterisation Review Report • Initial site and complex definition • Updated Early Risk Assessment • Licence milestone requirements • Engagement Schedule • Stakeholder Engagement Plan • Commercial or other conditionality • Project Governance and Organisation • Project Management • Assess Phase plan	• End Assess Phase Report • Storage Site and Complex Characterisation • Carbon store name • Site and complex definition • Preliminary Containment Risk Assessment • Preliminary Carbon Storage Development Plan • Preliminary Monitoring Plan • Preliminary Corrective Measures Plan • Provisional Post Closure Assessment • Draft SCAP • Preliminary PEP • Technology Screening • Commercial or other conditionality • Updated Stakeholder Engagement Plan* • Define Phase plan	• Define Phase Review • Final site and complex definition • Storage Permit Application • SSCC • CSDP • CRA • MP • CMP • PPCP • Proposal for Financial Security • Storage Permit Operator Approval, including Financial Soundness • SCAP • PEP • Technology Plan • Commercial or other conditionality • Updated Stakeholder Engagement Plan*	• Monitor Project Execution • Well Consents • Pipeline Works Authorisation • Financial Security (comes into effect) • Commissioning Plan • Storage Site Management Plan • Metering and Measurement Plan • Permit Conditions • Updated Stakeholder Engagement Plan* • Updated Plans**
	DESNZ	Site Characterisation Review	End Assess Review	Storage Permit	First Injection
	OPRED	Early project outline engagement with DESNZ	Environmental Statement preparation	ES Consultation & Decision Decommissioning security arrangements	Decommissioning security arrangements Well screening directions and any other requirements
	HSE	Early project engagement with HSE	HSE engagement	HSE engagement	HSE engagement
	TCE / CES	Initial engagement with TCE / CES	Further engagement with TCE / CES	Carbon storage lease preparation	
	OFGEM	Early engagement with OFGEM	Further engagement with OFGEM	Economic Assessment & Licence	Economic licensing obligations
	MMO / MS / NRW		Early engagement with MMO, MS or NRW	Further engagement with MMO, MS or NRW and marine licence (if required)	

* May need to be updated
 ** SSCC, CRA, CSDP, MP, CMP, PPCP, Technology Plan may need to be updated

12. Each Storage Permit Application document and CS licence deliverable matures through the CS licence lifecycle up to and including a Storage Permit Application (Figure 3).

13. This guidance sets out the process for and expectations of a Storage Permit Application submission. It is not a substitute for any other risk or other assessments that may be carried out by other regulators, bodies and government departments, including but not limited to, the Health and Safety Executive ('HSE'), His Majesty's Treasury, the Department for Energy Security and Net Zero's ('DESNZ'),

Offshore Petroleum Regulator for Environment and Decommissioning ('OPRED'), the Office of Gas and Electricity Markets ('Ofgem'), and insurance providers or others who may separately seek to satisfy themselves that an applicant and storage site will meet their criteria.

14. Any assessment made by the NSTA in respect of a CS licence and Permit, is made specifically and exclusively for the NSTA's own purposes in line with its regulatory role and should not be relied on by any third parties (including other regulators and public bodies) in any manner whatsoever. Any such reliance

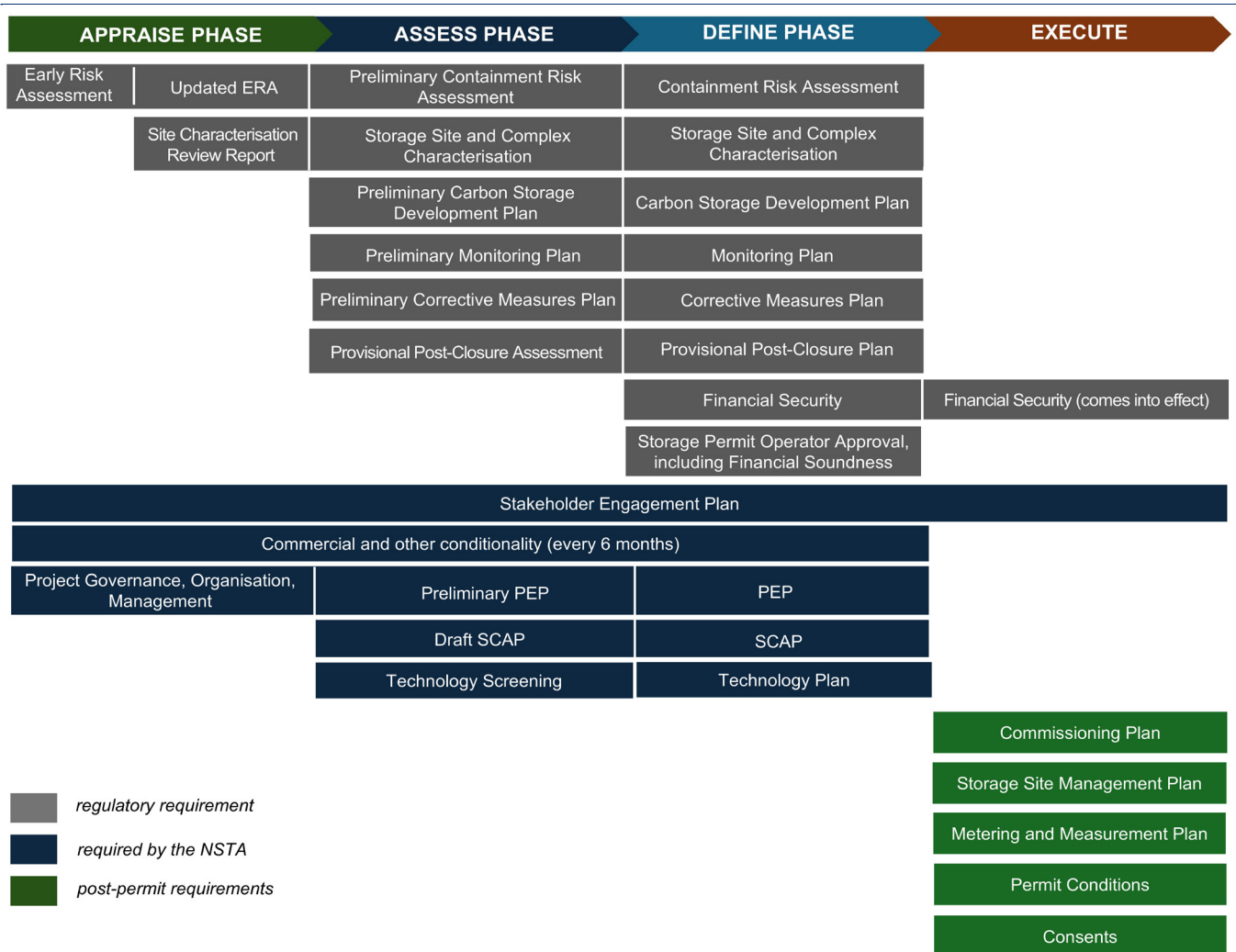
is at the sole risk of that third party and the NSTA does not accept any responsibility for such reliance.

15. This guidance is not a substitute for any regulation or law and is not legal advice. It does not have binding legal effect. Where the NSTA departs from the approach set out in this guidance, the

NSTA will endeavour to explain this in writing to the person seeking a decision from the NSTA.

16. The guidance will be kept under review. If the NSTA changes its guidance in a material way, it will publish a revised document.

Figure 3: The evolution of Storage Permit Application documents and other deliverables through the CS licence lifecycle.



Permit road map

17. The Permit road map (Figure 2) sets out the main stages of the NSTA's typical process during the Initial or Appraisal

Term and the Execute Phase of the Operational Term of a CS licence, from the point where a CS licence is

awarded to the application for a Permit and, if such Permit is granted, the execution of the project in line with the conditions set out in the Permit and other relevant documents.

18. The NSTA expects the Licensee to prepare and submit the Storage Permit Application. The Licensee should engage with the NSTA early and frequently in the planning of a Storage Permit Application, including to discuss:
 - i. The approach to assessing the containment of CO₂ and the wider risk assessment of the store, and
 - ii. Site characterisation and the assessment of the uncertainties in defining and characterising the storage site and complex

The Licensee should thereafter engage with the NSTA on the following (each as defined in the Storage Regulations):

- iii. The development concept and plan
- iv. Proposed Monitoring Plan
- v. Proposed Corrective Measures Plan
- vi. Proposed Provisional Post-Closure Plan
- vii. Proposal for Financial Security

The NSTA expects all of the requirements mentioned above to mature over time and engagement should build towards developing the content of the Storage Permit Application.

19. The Licensee's progress from one phase to the next should not be construed as

indicating that a Permit will be granted. The NSTA retains its discretion, having regard to relevant matters, as to whether or not to grant a Permit and it will make such decision only when it is in receipt of the complete and finalised Storage Permit Application. The NSTA will appoint a single point of contact for all discussions relating to the preparation and submission of a Storage Permit Application.

20. The submission of a Storage Permit Application is an iterative process between the applicant and the NSTA, designed to allow for the refinement of the required documents to ensure they are sufficient in all respects.

- i. **Draft application** – This is the set of documents submitted to the NSTA by the Licensee for initial review and also submitted to OPRED alongside the draft environmental statement ('ES'). During the iterative process of this review, more than one draft may be required. The Licensee should also share all document drafts with OPRED
- ii. **Final application** – Once the document content is agreed to be sufficient, the final set of documents can be submitted formally in the name of the proposed Storage Operator. The submission should be accompanied by a letter from the proposed Storage Operator stating that the documents submitted comprise the Storage

Permit Application. The Licensee should also share these documents with OPRED

21. In particular, the Licensee must provide the appropriate and necessary evidence and analysis in a Storage Permit Application to enable the NSTA to reach a determination that there is no significant risk of CO₂ leakage from all legacy wells⁹ at the time of Permitting. It is recommended that the evidence and analysis on legacy wells is discussed with the NSTA early in the preparation of an application in case further work is required prior to grant of the Permit. Licensees are also referred to NSTA Carbon Storage Stewardship Expectation 2 – Appraisal and Subsurface Characterisation¹⁰.
22. At an early stage, the Licensee should discuss with the NSTA its requirements for the grant of a Permit authorising the use of a place as a storage site for CO₂. The Licensee should also contact other relevant regulators and bodies at an early stage to discuss their regulatory requirements, including OPRED on its requirements for an ES, the HSE, and Ofgem on the requirements of an economic licence. The relevant regulators will work together during the applicable phases of the CS licence Appraisal Term and beyond to align (as far as is practicable) the award of any required Permits or licences.

Scalability of the process

23. The elements in the Permit road map and the project phases described above are intended to guide industry to an efficient and timely carbon storage development. It is recognised that for smaller projects (for example a subsea tie-back into existing injection facilities), some elements of the Permit road map may be streamlined, however all elements of the Permit road map are applicable, and for any Permit, the relevant regulatory requirements, including as set out in the Storage Regulations, will need to be met.

Charging

24. The NSTA charges a fee for Storage Permit Applications, including the review of draft documents and (if appropriate) the granting of or modification to any Permit. Further details of these charges can be found in the NSTA's guidance note on fees¹¹.

⁹ For these purposes 'legacy wells' are **ALL** existing wells in a CS licence area and those beyond the licence area that could see a pressure increase as a result of CO₂ injection.

¹⁰ Carbon Storage Stewardship Expectation 2 – Appraisal and subsurface characterisation

¹¹ North Sea Transition Authority (NSTA): Charging regime

NSTA framework

25. The NSTA regulates offshore CO₂ storage and is the licensing authority that approves and issues Permits and maintains the carbon storage public register. The NSTA is responsible for stewarding project developers through the NSTA licence and Permitting process as outlined in this guidance.
26. This guidance sets out the current best understanding of the detailed technical and subsurface considerations the NSTA may assess when reviewing a Storage Permit Application, the scope for carbon storage projects to contribute to emissions reduction, energy integration opportunities, and opportunities for the re-purposing of existing infrastructure for carbon capture and storage projects.

Stewardship expectations

27. In order to promote good industry practice help Licensees meet their statutory obligations, the NSTA has developed a number of bespoke Carbon Storage Stewardship Expectations¹² ('CS SEs'), including:
 - CS SE1 Containment Risk Assessment
 - CS SE2 Appraisal and subsurface characterisation
 - CS SE3 Data acquisition and use for appraisal and monitoring
 - CS SE4 Technology development and deployment
 - CS SE5 Stakeholder Engagement
28. For further aspects of carbon storage projects, Licensees are also referred to the Petroleum Stewardship Expectations¹³ ('Petroleum SEs'). Although not all components of the Petroleum Stewardship Expectations are applicable to carbon storage, many components of which are relevant and provide clarity on expected behaviours and good practices across the whole project lifecycle. The Petroleum SEs that may be applicable are:
 - SE05 Robust Project Delivery
 - SE11 Net Zero
 - SE12 Supply Chain Collaboration and Cooperation

¹² Carbon Storage Stewardship Expectations

¹³ Petroleum Stewardship Expectations

Considerations relevant to all carbon storage developments

Store names

29. An agreed store name is expected to be in place in the Define Phase of a project prior to submitting the draft Storage Permit Application documents. Licensees may request agreement to a carbon store name once they reach the Assess Phase of a project.
30. A Licensee may request or reserve a name by writing to the NSTA using a standard template¹⁴, and sending the required information to Carbon.Storage@nstauthority.co.uk.

Storage site, complex and hydraulic unit definitions

31. As part of the Storage Permit Application, the storage site, complex and hydraulic unit must be defined. These definitions are supported by and form part of the site characterisation as required by the Storage Regulations.
32. The definitions support the risk assessment and the development of the MP and CMP, and should mature as the project progresses. The final definitions are expected to be in place by the Define Phase review to allow the NSTA to assess the risk of leakage prior to a Permit decision.
33. Co-ordinate sets for the storage site and complex should also be provided for inclusion in the Permit and should encompass the maximum extents of the storage site and complex. These are proposed by the Licensee but reviewed and discussed by the NSTA prior to approval of the final co-ordinates. Further detail can be found in the Detailed Guidance.

Cross-border considerations

34. The Licensee must satisfy the NSTA before the NSTA can grant a Permit, in line with regulation 7(1)(b) of the Storage Regulations, that no part of the storage complex extends beyond UK territorial waters.

¹⁴ <https://www.nstauthority.co.uk/media/vvolby2l/template-for-request-of-ccs-field-name-approvaldecember-2023.docx>

CS licence considerations

CS licence shrinkage

35. Upon grant of a Permit, the area of the CS licence automatically reduces to the size of the storage site, unless otherwise directed by the OGA. Typically, the CS licence will be the same area as the site-bounding polygon. Considerations for a larger area may include, but are not limited to:
- i. Injection, transportation facilities or monitoring equipment not located directly over the storage site
 - ii. Legacy wells

CS licence split and multiple store developments

36. Where more than one storage site is located within a given CS licence, that licence must be split prior to grant of any Permit as the NSTA's current view is that the Storage Regulations envisage one storage site per CS licence. The Licensee should discuss the subdivision of the original CS licence with the NSTA, including the potential relinquishments of areas that are not part of any proposed carbon storage development. Any retained areas of the split licence must have an associated work programme to demonstrate progression of the licence, as outlined in the NSTA Guidance on the Application for a Carbon Storage Appraisal and Storage Licence¹⁵ ('Licence Guidance').

37. It should be noted that each storage site requires a Storage Permit Application, e.g., for a development containing multiple storage sites, separate applications must be made. These applications can be made simultaneously or phased, and the appropriate approach should be discussed with the NSTA.
38. Similarly, where the initial focus of a development is on a single storage site but with scope to build out to multiple storage sites, the Licensee will need to make subsequent Storage Permit Applications for each build-out development. Information on any plans for future storage site build outs should, however, be described in the Storage Permit Application for the first development area, where the Licensee should clearly identify any pre-investment in facilities the purpose of which are to facilitate potential future expansion of the current storage site or build out.

Sites overlapping more than one licensed area

39. Where a proposed storage site does not sit entirely within a single licensed area (e.g. it straddles more than one CS licence), the boundaries of the licences may need amending (one solution to this could be consolidation of those licensed areas). The Licensee should discuss any proposed storage sites that straddle more than one licensed area with the NSTA at an early stage.

¹⁵ Guidance on the application for a Carbon Dioxide Appraisal and Storage Licence

40. Any amended CS licence will need an exploration operator that will be assessed for competence as per the licence guidance. It should not be assumed that where an entity is approved to be the exploration operator under one CS licence that it will be automatically approved under any amended or additional CS licences.

Governance

41. Where there is more than one Licensee on a CS licence, the Storage Permit Application should represent a single view of the project by the Licensees, who are jointly and severally liable under the terms of the CS licence. The Licensees should appoint a single point of contact (who is someone on the CS licence) for the development of the Storage Permit Application. specific to carbon storage activity and in this guidance we use the term Storage Operator to have the same meaning as the term ‘operator’ as defined in the Storage Regulations; which means “...the person who carries on or (where different) controls activities at the storage site”. The Storage Operator must be a Licensee (see regulation 8(1) of the Storage Regulations) and Licensee(s) should be aware that this is a significant role with many of the responsibilities set out in the Storage Regulations falling on the Storage Operator.
42. If and when a Permit is granted, there will be an approved Storage Operator for the storage site. This role has a meaning

Carbon storage information and samples

Retention, reporting and disclosure

43. The Energy Act 2023, alongside the Oil and Gas Authority (Carbon Storage) (Retention of Information and Samples) Regulations 2025 (‘CS Retention Regulations’), sets out which carbon storage information and samples are required to be retained under a CS licence. Further details can be found in the NSTA “Guidance on retention, reporting and disclosure of carbon storage information and samples”¹⁶.

Consents

44. If a Permit is granted, additional consents will be required to carry out some of the necessary works.

¹⁶ Link to Information and Samples Guidance to follow

Pipelines

45. Pipeline Works Authorisations¹⁷ ('PWA') apply to carbon storage developments and will not usually be issued until after the Permit has been granted. The NSTA has published separate guidance on the PWA process¹⁸.
46. A PWA or variation should be in place before any pipeline or pipeline system construction or modification work begins. Before submitting a PWA application, the NSTA recommends that the pipeline owner (or prospective owner) contacts the NSTA, OPRED and the HSE at the earliest possible opportunity, to discuss the proposed scheme and the applicable regulatory requirements.
47. Where there are no objections, it normally takes approximately four to six months from receipt of a satisfactory application to issuing a PWA. In the case of pipelines in respect of which an ES is required under The Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020 ('2020 EIA Regulations'), the process may take longer. Storage Operators must, therefore, submit PWA applications at least four to six months before construction begins.

Wells

48. NSTA consent is required to undertake well activities throughout the entire project

life cycle and storage operations. This includes exploration/appraisal wells, well activities during facility development and operations such as drilling, well tests, well workovers, well shut-ins and well suspensions/abandonments. Applications for consents are made on the NSTA's Energy Portal using the Well Operations Notification System ('WONS'). The applications and subsequent notifications allow NSTA to consider whether CS licence and Permit conditions are being met. The NSTA has published separate guidance on the WONS process¹⁹.

Marine licence

49. A marine licence may be required for the installation and electrification of carbon storage development infrastructure. The Licensee should engage early with the NSTA and the relevant regulator once the CO₂ transportation and facilities concept has been selected. The marine licensing authority for England is the Marine Management Organisation ('MMO'), in Scotland it is Marine Scotland ('MS'), and for Wales it is Natural Resources Wales ('NRW').

Environmental impact and health and safety assessments

50. OPRED is the environmental regulator for the offshore storage of CO₂ in the territorial sea adjacent to the UK (with the exception of Scottish Territorial Sea) and in the UK Exclusive Economic Zone. The 2020 EIA Regulations apply

¹⁷ North Sea Transition Authority (NSTA): Pipeline Works Authorisations - Consents - Licensing

¹⁸ North Sea Transition Authority (NSTA): Guidance - Regulatory

¹⁹ UKCS Well Applications and Consents Guide

to certain carbon storage activities and set out the requirements for an Environment Impact Assessment ('EIA') or screening direction for such projects. Where the 2020 EIA Regulations apply, the NSTA cannot grant consent for such a project unless the Secretary of State first agrees to the grant of consent for the project. More information can be found on OPRED's web pages²⁰.

51. The HSE implements the applicable statutory and regulatory requirements for carbon storage well design and operational health and safety. For more information, the Licensee should contact the HSE.

Crown Estate agreements

52. In addition to a CS licence, seabed leasing rights and/or agreements from The Crown Estate ('TCE') or Crown

Estate Scotland ('CES') may also be required for CS licence activity for all offshore areas, including the territorial sea adjacent to Scotland and Wales, as the right to store gas (including carbon dioxide) in the areas outside the territorial sea is vested in the Crown by virtue of Section 1 of the Act. TCE and CES are statutory bodies which act on behalf of the Crown in its role as landowner within the area of the territorial sea and as owner of the sovereign rights of the UK seabed beyond territorial waters. TCE and CES operate as a commercial landowner under the provisions of the Crown Estate Act 1961²¹. The NSTA cannot provide guidance on a Crown Estate lease or agreement. Anyone who wishes to apply for a CS licence should also contact the TCE / CES as appropriate at the earliest opportunity.

Extraction of CO₂

53. As outlined in the Storage Regulations and Permit, the Storage Operator must not (and must not Permit any other person to) extract (which includes release) CO₂ into the atmosphere from the transport

network (as defined in the relevant PWA(s)), or from the storage site except with the prior written consent of the NSTA and in accordance with any conditions subject to which consent is given.

Re-purposing

54. The NSTA encourages Licensees to fully explore the opportunities to re-purpose existing suitable infrastructure in the development concept. In most

cases the opportunities will be from oil and gas infrastructure and the Licensee should engage with the current owner in the early phases of the project.

²⁰ The 2020 EIA Regulations - GOV.UK

²¹ Crown Estate Act 1961 (legislation.gov.uk)

Appraise Phase requirements

55. **The Appraise Phase** is the first phase of the CS licence in which the Licensee will carry out any exploration and appraisal activities to characterise the storage site and complex, including those laid out as obligations in the work programme of the CS licence.
56. The Licensee will be required to demonstrate to the NSTA that the critical risks to containment of CO₂ have been identified in addition to any potential risks to storage capacity, injectivity and monitorability through an Early Risk Assessment ('ERA'), whilst also identifying further studies, data gathering and/or appraisal required to address any risk or uncertainties. These will be critical to assessing the viability of the storage site and complex as a potential location for the permanent storage of CO₂ and will provide important information in preparing the Storage Permit Application.
57. At the end of the Appraise Phase the Licensee will have assessed and should demonstrate to the NSTA:
- whether the current subsurface database is sufficient and suitable to deliver a subsurface characterisation of the proposed storage complex and surrounding area
 - that all relevant appraisal data have been incorporated into a suite of appropriately scaled models to investigate different elements of the dynamic system
 - that the static model is complete (notwithstanding final inclusion of any data from completed appraisal activity or, by exception, as otherwise agreed with the NSTA and included in the Assess Phase plan
 - that dynamic models are available to forecast dynamic behaviours, test assumptions and understand the impact of CO₂ behaviour against key risks
- The technical work should be of a quality suitable for eventual inclusion in a Storage Permit Application.
58. The Licensee must develop and present the following to the NSTA for review:

Work programme items

- i. An **ERA**, which should identify and define any potential threats to the containment of CO₂, storage, injectivity, and monitorability, key uncertainties and the need for further studies, data gathering and/or appraisal. The ERA should be reviewed by at least two independent experts. Significant focus should be given to understanding legacy well risks (see CS SE2). There should be clear links between the work proposed and risk mitigation.
- ii. Any technical work programme commitments specific to the Licence.
- iii. **A Site Characterisation Review Report** ('SCRR'), which should demonstrate whether the current subsurface database is sufficient and suitable to deliver a subsurface characterisation of the proposed storage complex. It should integrate site-specific data, including but not limited to seismic data and other static and dynamic subsurface data, into an evaluation of the suitability of the proposed storage site and complex for the storage of CO₂. An updated ERA is also delivered with the SCRR.
- iv. An **engagement schedule** of proposed regular meetings, agreed with the NSTA, that are intended to assist the Licensee in demonstrating to the NSTA that appropriate progress is being made. The typical frequency of engagements is quarterly, but frequency will depend on the progress being made by the Licensee. An agenda will be agreed in advance with the NSTA.
- v. A **Stakeholder Engagement Plan** to demonstrate to the NSTA that the Licensee will consult and, as applicable, has consulted with other parties that might be affected by the proposed appraisal activities and any subsequent development activities under any Permit (if granted) and that such parties will not be unduly compromised by any appraisal and storage development plans. It should be noted that the Stakeholder Engagement Plan should be updated as appropriate through the assess, define and Execute Phases (see also CS SE5)
- vi. The status of any **commercial or other conditionality**, to be updated every six months, that may have a material impact on the timely delivery of a Storage Permit Application. The commercial

CS Licence Milestones, which should be submitted on or before the date the ERA report is required.

and other conditionality updates continue through the assess and Define Phases

- vii. Demonstration that the appropriate **project governance and organisation** is in place to support the eventual application to become a Storage Operator
- viii. Demonstration that an appropriate **project management** process is in place to deliver the project objectives and milestones, including the decision-making process,

stage-specific progression criteria and decision hold points. It should also demonstrate how quality and assurance are being applied, a project-specific risk management process for technical and non-technical risks, and that internal and external lessons learned are incorporated to ensure continuous improvement to the business process

Further details on the contents of these deliverables can be found in the Detailed Guidance.

Technical work programme commitments

59. The CS licence work programme may also include the requirement for a firm or contingent data acquisition programme in the Appraise Phase to assist in the adequate characterisation of the proposed site and complex or to sufficiently assess risks to containment, capacity or injectivity. This will be licence specific and will, amongst other things, depend on the number of existing wells in the proposed storage site and complex, the amount, age and quality of associated subsurface data, and the quality and coverage of seismic data. The NSTA's expectations for the delivery of appraisal

activity are laid out in CS SE2. This may include, but is not limited to:

- a. Appraisal well(s)
- b. Seismic acquisition
- c. Seismic reprocessing
- d. Specific technical studies

Where a work programme data acquisition requirement is a contingent commitment and the Licensee decides not to carry out the work, the NSTA will review in detail the Licensee's justification before making a decision on whether to waive the work programme commitment.

Early Risk Assessment workshop

60. The Early Risk Assessment workshop is held following submission of the ERA. The Licensee should provide a copy of

the report along with an independent review by at least two relevant independent technical experts, who have

been agreed previously with the NSTA. The experts should each produce an independent written opinion on the ERA (using the criteria outlined in Detailed Guidance) and present a summary of their findings at the workshop.

61. The purpose of the workshop is to provide the Licensee with an opportunity to review the ERA with the NSTA and external technical experts and should:
 - a. Provide a progress update on the work programme and other Licensee work in respect of the project
 - b. Inform the NSTA of the Licensee's proposed criteria for the assessment of the storage site and complex as a suitable place to store CO₂ (which should comply with the requirements set out in the Storage Regulations) and the associated uncertainties as determined from the data, including in relation to defining the storage site and complex
 - c. Identify any risks to a future operational storage site including, but not limited to, any threats to containment of CO₂ in the storage site and complex
 - d. Identify and agree with the NSTA any further risk reduction measures to be taken
62. Following the workshop, the external technical experts should submit their written opinion on the report to the NSTA.

Site Characterisation Review

63. A Site Characterisation Review meeting is held following relevant technical workshops agreed with the NSTA and submission of the SCRR (see Detailed Guidance). NSTA review is carried out against the requirements for site characterisation as laid out in Annex 1 of the Directive and as included in the Storage Regulations.
64. The Site Characterisation Review provides the Licensee the opportunity to discuss the SCRR and updates to the ERA with the NSTA and to discuss any further work that needs to be carried out in order to meet the Annex 1 requirements.
65. Not all work will necessarily need to be completed in the Appraise Phase. Some work, e.g. incorporation of appraisal well data or optimisation of the dynamic modelling, may be carried forward into the Assess Phase, but the Licensee are expected to provide a clear plan as to its delivery.
66. If the Annex 1 requirements have not been met and there is no clear plan to deliver the work to meet them, the CS licence will remain in Appraise Phase, following discussion with the NSTA, until sufficient work has been completed.

Assess Phase plan

67. Before progressing into the Assess Phase of the project the Licensee must submit to the NSTA an Assess Phase activity plan and schedule.

End of the Appraise Phase

68. Following NSTA review of the SCRR and the Assess Phase plan, the Licensee will be informed whether they have progressed to the Assess Phase. Progression into the Assess Phase does not give the Licensee any expectations that a Permit will be granted.

Assess Phase requirements

69. During the Assess Phase of the CS licence the proposed storage site and complex are fully characterised to produce the Storage Site and Complex Characterisation ('SSCC'), building on the work undertaken in the Appraise Phase. Any additional data gathering, studies and appraisal activities agreed in the Appraise Phase should be integrated into the work programme, executed and completed.
70. A preliminary Carbon Storage Development Plan ('CSDP') is prepared, which should contain an outline of the Licensee's concept-select assessment and provide the NSTA with sufficient information to understand the conceptual development and associated engineering considerations. It should also contain an initial view on the potential impacts of the storage site on other uses of the area surrounding the storage site ('undue interference'), which will be required for the Storage Permit Application.
71. The Assess Phase should continue to develop the risk assessment into the preliminary Containment Risk Assessment ('CRA'), building on the earlier ERA. The preliminary CRA will also inform the preliminary MP, preliminary CMP and the Provisional Post-Closure Assessment.
72. The Licensee should also demonstrate that consultation has begun with the appropriate NSTA team on the Project Execution Plan ('PEP'), Supply Chain Action Plan ('SCAP') and Technology Screening (see Detailed Guidance).
73. The 6-monthly submission of the commercial and conditionality report and the regular engagement schedule with the NSTA continue during the Assess Phase, and the Stakeholder Engagement Plan should be updated as appropriate.

Environmental Statement ('ES') preparation

74. Under the 2020 EIA Regulations the Licensee is required to submit an ES to OPRED. The Licensee should normally engage with OPRED in the Assess Phase, and the choice of development concept should be made giving full weight to any environmental concerns. The Licensee is referred to the 2020

EIA Regulations and related OPRED guidance²² for further information on the preparation and submission of an ES.

The timescale for the process may vary from project to project.

Net zero

75. The Licensee is expected to demonstrate that greenhouse gas ('GHG') emissions have been considered and evaluated as part of the Assess Phase work, including how the Licensee will commit to reduce GHG emissions through its corporate culture and demonstrable action through all stages of a project lifecycle. This

should include an indicative evaluation of the GHG emissions impact of the development as well as technical and economic assessments. While not directly applicable to carbon storage projects, the NSTA considers that its Petroleum SE11 provides useful guidance in this regard.

Marine licence

76. The Licensee should start engaging with the NSTA and the relevant regulator (see Consents section) to ascertain whether a marine licence is required for the selected development concept.

Assess Phase report

77. The Assess Phase report should be provided to the NSTA by an agreed date and should comprise the following documents (see Figure 2):

- Storage Site and Complex Characterisation
- Preliminary Carbon Storage Development Plan

- Preliminary Containment Risk Assessment
- Preliminary Monitoring Plan
- Preliminary Corrective Measures Plan
- Provisional Post-Closure Assessment

Licensees are referred to the Detailed Guidance for further details on these documents.

²² The 2020 EIA Regulations - GOV.UK

End Assess Phase review

78. An end Assess Phase review meeting will take place for the Licensee to demonstrate to the NSTA that, among other things:
- a. The storage site and complex are fully assessed and characterised
 - b. There is a mature definition of the storage site and complex
 - c. The CRA has continued to mature and takes into account considerations related to the selected development concept
 - d. The CO₂ transportation and facilities concept selected by the Licensee is the most appropriate, including a demonstration of net zero considerations
 - e. The monitoring strategy is appropriate and linked to the preliminary CRA
 - f. Corrective measures have been identified, including the appropriate steps to be taken and how they might be implemented
79. The end Assess Phase review will determine if and when the Licensee can progress into the Define Phase of the project by providing assurance to the NSTA that the technical work is at a sufficient stage of maturity, and that appropriate progress is being made to demonstrate that the requirements of the Storage Regulations are understood and being addressed.
80. If the NSTA has any further comments/concerns to be addressed, it may seek to agree with the Licensee a programme of work or further review, intended to lead to its resolution within an agreed timeframe before the project can progress into the Define Phase.

Define Phase plan

81. Before progressing to the Define Phase of the project, the Licensee must provide the NSTA with an activity plan and schedule for the Define Phase.

End of the Assess Phase

82. Following the end Assess review meeting and review of the Define Phase plan, the Licensee will be informed whether they have progressed to the Define Phase. Progression into the Define Phase does not give the Licensee any expectations that a Permit will be granted.

Define Phase requirements

83. The Define Phase of the CS licence continues to build on the requirements and documents of the Appraise and Assess Phases. The eventual aim of the Define Phase is the submission of a Storage Permit Application which, if approved, will allow the Storage Operator to install facilities and inject CO₂ into a specified storage site.
84. The 6-monthly commercial and conditionality report submission and the regular engagement schedule with the NSTA continue during the Define Phase, and the Stakeholder Engagement Plan should be updated as the project matures.
85. During the Define Phase, the development concept as laid out in the CSDP should be matured to a stage where the Licensee will take a final investment decision ('FID') and ensure that all relevant Licensee and regulatory approvals have been secured. The Define Phase should deliver all the information necessary to ensure a robust project is developed with clear scope, cost estimate and schedule, along with both a PEP and SCAP.
86. A number of workshops may be held with the Licensee during the Define Phase on selected technical topics. These meetings are for the Licensee to demonstrate to the NSTA the technical rigour and study work that lies behind the content of the Storage Permit Application documents. Holding these meetings prior to the submission of the draft Storage Permit Application is intended to help the Licensee prepare the documents for submission.

Store name

87. An agreed store name should be in place prior to submitting the draft Storage Permit Application documents and preferably prior to the Define Phase review meeting.

Define Phase review meeting

88. The Define Phase review meeting takes place prior to the Licensee submitting the draft Storage Permit Application. This review provides the opportunity for the Licensee to demonstrate to the NSTA that the project development plan is fully optimised and described, all technical work is complete, and that the risk assessment is mature.
89. The meeting will include, but is not limited to, a review of the SSCC,
- CSDP, CRA, MP, CMP, PPCP and the Proposal for Financial Security. Through this review, the Licensee should demonstrate that the project work is of sufficient maturity for the Storage Permit Application documents to be finalised for submission to the NSTA.
90. Once the NSTA is satisfied, the Licensee will be informed that they can prepare the draft Storage Permit Application.

Storage Permit Application

91. The submission of a Storage Permit Application is an iterative process between the applicant and the NSTA, designed to allow for the refinement of the required documents to ensure they are sufficient in all respects.
- i. Draft application – This is the set of documents submitted to the NSTA for initial review and also submitted to OPRED alongside the draft ES. During the iterative process of this review, more than one draft may be required. The Licensee should also share all document drafts with OPRED
- ii. Final application – Once the document content is agreed to be sufficient, the final set of documents can be submitted formally in the name of the proposed Storage Operator. The submission should be accompanied by a letter from the proposed Storage Operator stating that the documents submitted comprise the Storage Permit Application. The Licensee should also share these documents with OPRED
92. The Storage Permit Application comprises the following seven documents:
- Storage Site and Complex Characterisation
 - Carbon Storage Development Plan
 - Containment Risk Assessment
 - Monitoring Plan
 - Corrective Measures Plan
 - Provisional Post-Closure Plan
 - Proposal for Financial Security

Details on the contents of each of these documents can be found in the Detailed Guidance.

Operating conditions and operational requirements

93. The proposed operating conditions should be submitted by the Licensee in the CSDP as part of the Storage Permit Application as outlined in regulation 8(1)(c) of the Storage Regulations. The proposed operating conditions should take into consideration, amongst other things:
- The geological and geomechanical regime of the proposed store
 - The duration and rate of injection, and the total quantity CO₂ to be injected
 - The pressure regime of the store

Further technical guidance on can be found in the Detailed Guidance.

94. For all storage sites, the operational requirements, as submitted in the CSDP, will be set out in the Permit. These will usually be based on the proposed maximum and minimum cases as stated in the Storage Permit Application.
95. Licensees should note that the NSTA cannot issue a Permit with maximum injection and pressure limits that exceed those set out in the Secretary of State's agreement to the grant of a Permit, i.e., those described in the ES.

Draft Storage Permit Application review

96. The NSTA will undertake a review of the Licensee's draft Storage Permit Application documents to determine if the following, amongst other matters, have been demonstrated and evidenced to the NSTA's satisfaction in line with the requirements of the Storage Regulations:

- i. That under the proposed conditions of use of the storage site, there is no significant risk of leakage or of harm to the environment or human health
- ii. That subsurface characterisation of the proposed storage site and complex and surrounding area is complete and directly informs the CSDP, CRA, MP and CMP
- iii. The viability of the CSDP and the necessary justification of such plan
- iv. That the methods and technologies to be deployed as outlined in the MP are appropriate for the conclusions of the CRA and are fit for purpose to:

- a. Demonstrate conformance CO₂ plume behaviour against models
- b. Demonstrate containment of CO₂
- c. Alert where there may be an increased risk of significant irregularity or leakage
- d. Identify and quantify significant irregularities or leakage should they occur
- v. That the corrective measures methods and technologies to be deployed as described in the CMP are fit for purpose in preventing or stopping any significant irregularities or leakage events and cover all eventualities identified in the CRA, including contingency plans in the event any deployed corrective measures are not successful
- vi. The PPCP is adequately described and acceptable
- vii. That measures are being put in place to prevent undue interference with other uses of the area surrounding the storage site
- viii. The Proposal for Financial Security
- ix. The financial soundness of the proposed Storage Operator
- x. The emissions basis for the development
- 97. The NSTA may seek independent verification on review of all or parts of the Storage Permit Application documents. Where the NSTA is not in agreement with the information, analysis, plans, or justifications provided, the NSTA will, where appropriate, advise on any necessary changes that should be implemented by the Licensee before resubmitting. Should the NSTA conclude from its review based on the information and analysis provided, that the Licensee has not demonstrated that there is no significant risk of leakage or of harm to the environment or human health, it will be expected to provide necessary justification and any supporting data and analysis, or a Permit will not be granted.

Storage Operator

- 98. The Licensee must also appoint a Storage Operator, which requires NSTA approval. The prospective Storage Operator must be a Licensee under the CS licence. To be approved by the NSTA as a Storage Operator a company must demonstrate that they understand and can satisfactorily fulfil their obligations under the Permit, specifically as set out in the Storage Regulations. More detail can be found in the Detailed Guidance.

99. The decision on Storage Operator is run in parallel with that on the Permit, and engagement should continue through the Define Phase and Storage Permit Application review to finalise operatorship in time for the Permit decision. These engagements may be combined with those for the Storage Permit Application review or may be run separately.
100. It should be noted that approval is on a Permit-by-Permit basis, i.e. it should not be assumed that where an entity is approved to be the Storage Operator under one Permit that it will be automatically approved under any additional Permits.
101. A change in operator, whether that is the appointment of a Storage Operator or a change in the identity of the exploration operator or Storage Operator at any point within the CS licence and Permit lifecycle, requires the preparation and agreement of an ISP with the NSTA (see the Guidance on Information and Samples Plans and Coordinators for Carbon Storage). Where a Storage Operator is appointed and a change in the CS licence area (e.g. reduction of the licence area to the size of the storage site) takes place at the same time, a single ISP covering both events can be prepared.

Financial Soundness

102. As part of the Storage Permit Application the NSTA carries out an assessment of the financial soundness of the proposed Storage Operator, as required by regulation 7 of the Storage Regulations. More information is provided in the NSTA Detailed Guidance and the separate guidance on the approach to assessing financial soundness²³.

²³ NSTA updated Financial Soundness guidance will be published in due course

PEP, SCAP and Technology plan

103. During the Define Phase, the finalised PEP and SCAP should be submitted to the NSTA and the Technology Plan incorporated into the relevant Storage Permit Application documents .

Economic assessment

104. The Licensee will be required to submit relevant data for economic assessment to Ofgem for the purposes of an Economic Licence. These data should also be submitted to the NSTA for review at the same time for the purposes of benchmarking.

Environmental Statement consultation

105. The NSTA cannot grant a Permit to authorise the use of a place as a storage site until OPRED (acting on behalf of the Secretary of State) has agreed to the grant of such consent²⁴.
106. The Licensee should prepare an ES to be submitted to OPRED at the same time as the draft Storage Permit Application is submitted to the NSTA (the NSTA does not provide these documents), and all subsequent drafts of the Storage Permit Application documents should also be provided to OPRED. Under the 2020 EIA Regulations, all ESs are subject to a period of public consultation during which time any person may submit representations in relation to the proposed project to the Secretary of State. Licensees should bear in mind that the consideration of an ES generally takes several months and can take much longer than this if significant representations are made by any person, or if insufficient information is presented within the ES.
107. Once OPRED reaches a conclusion on the significant effects of the project on the environment, OPRED will notify the Licensee (the 'developer' in the 2020 EIA Regulations) of the Secretary of State's decision whether to agree to the grant of consent. If the Secretary of State agrees to the grant of a consent, OPRED will inform the Licensee of any environmental conditions attached to such agreement. OPRED will also inform the NSTA of the Secretary of State's decision.

²⁴ Oil and gas: offshore environmental legislation - GOV.UK (www.gov.uk), reg 4

Marine licence application

108. The Licensee should confirm early in the process whether the development infrastructure requires a marine licence and should submit an appropriate marine licence application, which will be to either the MMO, MS or NRW depending on the location of the

proposed storage site. The Licensee should be aware that consideration of a marine licence may need additional environmental approvals from the local body and that the marine licence may take several months to grant.

Decommissioning security arrangements

109. OPRED needs to be satisfied that appropriate financial security arrangements for decommissioning are in place. The Licensee should engage with OPRED on this matter and keep the NSTA informed and ensure

that the Storage Permit Application contains sufficient detail of post-closure operations and an estimate of the total cost of the post-closure period and the post-transfer costs.

Submit final Storage Permit Application

110. Once the process set out in this guidance is complete and the NSTA has indicated that the draft application documents are sufficient, the Licensee may submit the final Storage Permit Application. This should be submitted formally by electronic means and accompanied by a cover letter on the headed notepaper of the intended Storage Operator. All final documents should also be marked with the logo of the intended Storage Operator.

disclosed by the NSTA after a period of five years from the date of first injection or when a determination event²⁵ occurs in respect of the relevant CS licence, whichever is the earlier (regulation 12 of the CS Disclosure Regulations). Any commercially sensitive information will be redacted from the document prior to disclosure.

111. It should be noted the geotechnical information contained in the final Storage Permit Application may be

²⁵ A determination event means a surrender of rights under a CS licence in respect of all or part of the area to which the licence relates, the expiry of a CS licence, the termination of a CS licence, the revocation of a CS licence, or the revocation of a Storage Permit

Granting a Storage Permit

112. A Permit may only be granted if, among other things, the Licensee has demonstrated to the NSTA's satisfaction that under the proposed conditions of use of the storage site, there is **no significant risk of leakage or of harm to the environment or human health**.
113. A Permit, if granted, will authorise the use of a place as a storage site for CO₂. This will grant authorisation for the approved Storage Operator to proceed with both the construction of facilities and other infrastructure, subject to the necessary consents, and the injection of a CO₂ stream consisting overwhelmingly of carbon dioxide into the storage site, subject to the terms and conditions set out in the Permit, which may be updated and amended from time to time.
114. The Permit will be granted for the development plan as outlined in the Storage Permit Application; however, the Storage Operator is expected to continue to engage with the NSTA as the project is executed. It is the Storage Operator's responsibility to ensure it has obtained all other required regulatory and other approvals.
115. At the same time as the grant of a Permit the following are also undertaken:
 - The MP, CMP and PPCP are approved as per the Storage Regulations
 - The CSDP is approved
 - The Storage Operator is appointed
 - The CS licence area reduces to the size of the storage site, unless otherwise directed by the NSTA
 - The prepared ISP covering the relevant licence events is agreed with the NSTA.
116. The Permit will contain a number of conditions that must be met prior to first injection. Some conditions, such as the preparation of certain plans, are applicable to all carbon storage projects. Other conditions, such as technical or well work, are specific to a particular store. These conditions will be stewarded during the Execute Phase.

Execute Phase requirements

117. The **Execute Phase** sees the implementation of the project development plan and all associated activities as set out at the time of Permit award or following any subsequent approved modification to the Permit. Successful execution ensures safe injection of CO₂ in line with the Permitted conditions during the operate phase. First injection of CO₂ marks the end of the Execute Phase.
118. Although the Execute Phase is only relevant where a Permit has been granted and sits outwith the formal Storage Permit Application, information on project execution should be covered in the PEP provided at the time of Storage Permit Application.

Project Execution Planning and monitoring

119. The PEP provided at the time of the Storage Permit Application should include a project schedule including major decision points and milestones.
120. Amongst other conditions, the Permit will require the Storage Operator to prepare a Commissioning Plan, Storage Site Management Plan and Metering and Measurement Plan^{26 27 28} prior to first injection. The NSTA expectation is that the Storage Operator gives consideration to relevant milestones and the approach to each milestone within the PEP and the approved CSDP.
121. As part of the PEP the Storage Operator should also discuss and agree an engagement plan with the NSTA. During the Execute Phase, progress against the project schedule is expected to be monitored and deviations from the planned schedule should be reported to the NSTA.

²⁶ <https://www.nstauthority.co.uk/media/a5mj3p0z/guidance-on-the-content-of-an-offshore-carbon-storage-site-management-plan-july-2026.pdf>

²⁷ <https://www.nstauthority.co.uk/media/5tghhhgn/guidance-for-carbon-storage-commissioning-plans-july-2026.pdf>

²⁸ <https://www.nstauthority.co.uk/media/cxlf3wra/guidance-for-carbon-storage-metering-and-measurement-plans-july-2026.pdf>

Compliance with the approved Permit

122. Once a Permit has been granted, the Licensee must comply with the conditions set out in that Permit, including but not limited to compliance with the actions set out in the MP, some of which may need to be fulfilled during the Execute Phase.
123. Should the Licensee wish to propose any change in the operation of the storage site (including any change to the operator) or a modification to the Permit then it must promptly inform the NSTA of such proposals. Any modifications to the Permit require NSTA approval and should be requested following the notification and implementation of change procedure described below.
124. If proposing any amendment to the Permit, the Storage Operator should also contact OPRED for further information to understand what may be required under the 2020 EIA Regulations.
125. The Licensee should be aware of the enforcement powers in connection with CS licences, including those set out under Chapter 3 of the Energy Act 2008 which include certain offences relating to CS licences.

Financial security (come into effect)

126. At least six months prior to the commencement of injection, the Storage Operator must provide evidence, and the NSTA must be satisfied, that the financial security will be in place at the point of first injection and that it will cover all the applicable obligations as set out under the Storage Regulations

Notification and implementation of changes

127. This section is designed to assist Storage Operators that plan to notify the NSTA of a planned change in the operation of the storage site to that from the granted Permit, including any change concerning the Storage Operator. This guidance relates to requests made under the Permit condition relating to ‘Notification and implementation of changes’ in accordance with regulation 11 and paragraph 4 of Schedule 2 of the Storage Regulations.
128. This section explains the process that takes place when a change is notified to the NSTA and what evidence may be requested by the NSTA on a case-by-case basis, depending on the context of the change.
129. In summary, once the NSTA has received a notification of change and target date, the NSTA will respond to the Storage Operator to specify any further evidence required that will be used to determine if the notified change will be approved and implemented, and to determine if a modification to the granted Permit is appropriate
130. Engagement with the NSTA prior to the notification of change is advised to streamline the processing of the change notification. The notification of change and any further evidence should be submitted formally by electronic means.

Notification of change

131. The Storage Operator must notify the NSTA of any changes planned in the operation of the storage site, including any change concerning the Storage Operator, as required under the terms of the Permit in accordance with the Storage Regulations.
132. The notification of change must be made in advance of any change and specify a target date. It should include a summary of, and justification for, the change. Where a change solely concerns the Storage Operator, the change must be notified at least 4 weeks before the target date. Other changes must be notified at least 3 months before the target date. Note that a change may necessitate the preparation and agreement of an ISP with the NSTA (see the “Carbon storage information and samples” section in this guidance).

133. The target date is the date on which the Storage Operator proposes to implement the change.
134. The NSTA can amend the target date to a later date, provided it does so no less than a week before the notified target date. The NSTA can extend the target date more than once, always with at least one weeks' notice.
135. The NSTA will use the summary and justification provided with the notification of change to determine whether any further evidence is required in support of the change (and consider if the target date needs amending to accommodate consideration of any such further evidence).
136. The NSTA will also consider whether, in its opinion, the notification relates to a substantial change. A substantial change means any change not provided for in the Permit, which may have significant effects on the environment or human health. Depending on the nature of the change requested, the NSTA may also wish to reassess whether there is a significant risk of leakage. It may be that further evidence is required to inform this type of assessment.
137. The NSTA will send a letter to the Storage Operator specifying if the proposed change is a substantial change, the further evidence required and confirming the target date or setting a later date. A meeting should then be arranged with the NSTA to agree the further evidence if the NSTA has communicated that further evidence is required.
138. The NSTA will rely on the further evidence provided by the Storage Operator, along with other information as determined on a case-by-case basis, to determine whether to modify the Permit or not. If a change is not deemed a substantial change, the NSTA can choose to modify the Permit, but must notify the Storage Operator of the date any modification comes into effect and when it can be implemented. The NSTA will make this notification before the target date (or amended target date). If a change is determined to be a substantial change the NSTA must either modify the Permit or notify the Storage Operator the change cannot be implemented, again, this notification will be made before the target date (or amended target date).
139. Note that before making any modification the NSTA must consult with the Storage Operator and any other holder of the CS licence.
140. A change cannot be implemented before the later of either (i) the target date (or amended target date) and (ii) the date the NSTA has notified the Storage Operator that the change may be implemented. If the NSTA has not notified the Storage Operator of an implementation date (and the change is not a substantial change that the NSTA has notified cannot be implemented) then the change can be implemented

on the later of the target date or an extended target date.

141. The NSTA is not the only regulator with an interest in carbon storage, and it is the Storage Operator's responsibility to ensure that all necessary approvals and authorisations linked to a notification of change are sought from the relevant regulators and other bodies. Whilst it is the Storage Operator's responsibility to engage with relevant regulators and other bodies, the NSTA may consult

with relevant regulators and other bodies (including but not limited to OPRED and Ofgem), as required.

142. When considering a notification of change, the NSTA will, amongst other things, also take into account its obligations under legislation, including the 2020 EIA Regulations and the Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (as amended) as applicable.

Further evidence

Evidence to support a change in the operation of the storage site

143. Once the NSTA has received a notification of change, the NSTA will consider if any further evidence is required to assess whether the change so notified amounts to a substantial change and how to proceed with that change. This will be judged by the NSTA on a case-by-case basis.
144. A further evidence request in relation to a change in the operation of the storage site will likely be based on the original Storage Permit Application documents. These documents currently include but are not limited to:
1. Storage Site and Complex Characterisation
 2. Carbon Storage Development Plan
 3. Containment Risk Assessment

4. Monitoring Plan
5. Corrective Measures Plan
6. Provisional Post-Closure Plan
7. Financial security

145. The NSTA may request further evidence in support of the notified change to demonstrate that following the notified change, under the proposed conditions of use of the storage site, there is no significant risk of leakage or of harm to the environment or human health.
146. Depending on the change notified, one or more of the above documents may require resubmission along with supporting evidence.

Evidence to support a change of Storage Operator

147. The NSTA may request evidence that a proposed new Storage Operator:

- is technically competent (including in the operation of environmental management systems)
- is financially sound
- can be relied upon to carry out the functions of a Storage Operator
- has in place an appropriate programme of professional and technical development and training
- can maintain financial security to comply with the Storage Regulations

For further details on the specific detail requirements, please refer to the Detailed Guidance.

148. Where a change to Storage Operator also involves either a licence transfer or change in control, the principles set out in Carbon Dioxide Appraisal and Storage Licence: Licence Transfer and Change in Control Approach should also be considered when making a notification.

Definition of terms

In this guidance the following expressions have the meanings as given by the Storage Regulations:

- “CO₂” means carbon dioxide;
- “injection” means injection of CO₂ into a storage site;
- “legislation” means legislation in force in the United Kingdom (whether passed, or made, before or after the commencement of these Regulations);
- “the Directive” means Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide
- “Storage Permit” means a consent granted under a licence, authorising the use of a place as a storage site;
- “licensed area” means the area within which activities are authorised under the licence;
- “target date” has the meaning given by regulation 11(3)(a) and is the date on which the operator proposes to implement a change notified under paragraph 4(1) of Schedule 2, or any later date the authority considers is required in order for it to make such a notification.

The following expressions are as provided by the Storage Regulations and have the meanings given by Article 3 of the Directive (and cognate expressions are to be construed accordingly):

- ‘closure’ of a storage site means the definitive cessation of CO₂ injection into that storage site;
- ‘corrective measures’ means any measures taken to correct significant irregularities or to close leakages in order to prevent or stop the release of CO₂ from the storage complex
- ‘CO₂ plume’ means the dispersing volume of CO₂ in the geological formation;
- ‘CO₂ stream’ means a flow of substances that results from CO₂ capture processes;
- ‘exploration’ means the assessment of potential storage complexes for the purposes of geologically storing CO₂ by means of activities intruding into the subsurface such as drilling to obtain geological information about strata in the potential storage complex and, as appropriate, carrying out injection tests in order to characterise the storage site;
- ‘hydraulic unit’ means a hydraulically connected pore space where pressure communication can be

measured by technical means and which is bordered by flow barriers, such as faults, salt domes, lithological boundaries, or by the wedging out or outcropping of the formation;

- ‘leakage’ means any release of CO₂ from the storage complex;
- ‘migration’ means the movement of CO₂ within the storage complex;
- ‘significant irregularity’ means any irregularity in the injection or storage operations or in the condition of the storage complex itself, which implies the risk of a leakage or risk to the environment or human health;
- ‘significant risk’ means a combination of a probability of occurrence of damage and a magnitude of damage that cannot be disregarded without calling into question the purpose of [the] Directive for the storage site concerned
- ‘storage complex’ means the storage site and surrounding geological domain which can have an effect on overall storage integrity and security; that is, secondary containment formations;
- ‘storage site’ means a defined volume area within a geological formation used for the geological storage of CO₂ and associated surface and injection facilities;
- ‘substantial change’ means any change not provided for in the Storage Permit, which may have significant effects on the environment or human health.

