二酸化炭素海底下貯留評価ガイドライン

参考資料6

附属書Ⅱ（WAF）、一般 WAG（1997）と CO2WAG（SG29/WP.5）の比較

附属書Ⅱ（WAF）	一般WAG（1997）	CO2WAG（SG29/WP.5）	CO2WAG（SG29/WP.5）仮訳
ANNEX 2 ASSESSMENT OF WASTES OR OTHER MATTER THAT MAY BE CONSIDERED FOR DUMPING	GUIDELINES FOR THE ASSESSMENT OF WASTE OR OTHER MATTER THAT MAY BE CONSIDERED FOR DUMPING	SPECIFIC GUIDELINES FOR THE ASSESSMENT OF CARBON DIOXIDE STREAMS FOR DISPOSAL INTO SUB-SEABED GEOLOGICAL FORMATIONS	海底下地質累層へ処分する二酸化炭素流の評価のための特定ガイドライン
GENERAL	INTRODUCTION	1 INTRODUCTION	1 序
		1.1Carbon dioxide sequestration in sub-seabed geological formations, a process consisting of separation of carbon dioxide from industrial and energy-related sources, transport to an offshore geological formation, and long-term isolation from the atmosphere, is one option in a portfolio of mitigation actions for stabilization of atmospheric greenhouse gas concentrations. Carbon dioxide sequestration has the potential to make a substantial contribution to reducing carbon dioxide emissions to the atmosphere, thus preventing these emissions from being absorbed into the oceans.	1.1 海底下地質累層への二酸化炭素隔離は、産業及びエネルギー関連の排出源からの二酸化炭素分離、沖合の地質累層への輸送、及び大気からの長期的隔離の工程から成り、本行為は大気中の温室効果ガス濃度の安定に向けた対策選択肢における様々な措置の一つである。二酸化炭素隔離には、二酸化炭素排出量削減に大いに貢献する可能性があるため、排出された二酸化炭素が海洋へ吸収されるのを防止することができると考えられる。
		1.2 Ocean acidification and other global effects on the marine environment caused by elevated emissions of carbon dioxide are a cause of serious concern. Carbon dioxide sequestration (in combination with other measures) would have direct benefits for the marine environment in mitigating: .1 changes in ocean CO2, carbonate and pH levels; .2 the effects of increased anthropogenic CO2 levels on sensitive biological systems such as coral reefs; and .3 the risk that lower pH may change the availability of key nutrients (e.g. nitrogen and phosphorus) required for phytoplankton growth and ocean productivity.	1.2 二酸化炭素排出量の増加による、海洋酸性化及びその他の海洋環境に及ぼす地球規模の影響は、深刻な問題である。（他の対策と併用された）二酸化炭素隔離は、以下の問題を緩和し、海洋環境へ直接的な恩恵をもたらすと考えられる。 .1 海水中の二酸化炭素、炭酸及び水素イオン濃度の変化 .2 人為的二酸化炭素レベルの上昇による、珊瑚礁等の感受性の高い生物系に対する影響 .3 水素イオン濃度の低下により、植物プランクトンの生長及び海洋生産に必要な主要栄養素（例：窒素、リン）の供給を変化させる危険性
		1.3 Potential risks of carbon dioxide sequestration include those associated with leakage of the carbon dioxide and any other substances in the carbon dioxide stream. In general, there are four different levels of concern for leakage: .1 the global dimension concerns the impacts of leakage on climate and the oceans; .2 the local dimension concerns the site-specific impacts of leakage and includes the effects on the marine environment, which are a principal focus of the London Convention; .3 the short-term consequences of leakage might include acute effects on human health and living marine resources; and .4 the long-term consequences of leakage might include acidification and negative impacts on	1.3 二酸化炭素隔離の潜在的リスクには、二酸化炭素、及び、二酸化炭素流中のその他の物質の漏洩に関連するリスクが含まれる。一般的には、4つの異なる段階の漏洩による懸念がある。 .1 漏洩が気候や海洋に及ぼす地球規模での影響の懸念 .2 ロンドン条約の主要な焦点ともなっている海洋環境への影響を含む、漏洩によるサイト特有の局所的な影響 .3 ヒトの健康及び海洋生物資源への急性影響が含まれる可能性がある漏洩の短期的影響 .4 酸性化と海洋生態系への悪影響が含まれる可能性がある漏洩の長期的影響

		marine ecosystems.	
		1.4 These Specific Guidelines deal with potential risks posed by carbon dioxide sequestration primarily at the local scale and include the potential for impacts on the marine environment in proximity to the receiving reservoir.	1.4 本ガイドラインは、二酸化炭素隔離により引き起こされる、主に局所的な潜在的リスクを対象とし、且つ、受け入れ貯留層近辺の海洋環境への影響の可能性を含む。
1 The acceptance of dumping under certain circumstances shall not remove the obligations under this Annex to make further attempts to reduce the necessity for dumping.	1 The Guidelines for the Assessment of Wastes or Other Matter that May be Considered for Dumping are intended for use by national authorities responsible for regulating dumping of wastes and embody a mechanism to guide national authorities in evaluating applications for dumping of wastes in a manner consistent with the provisions of the London Convention 1972 or the 1996 Protocol thereto. Annex 2 to the 1996 Protocol places emphasis on progressively reducing the need to use the sea for dumping of wastes. Furthermore, it recognizes that avoidance of pollution demands rigorous controls on the emission and dispersion of contaminating substances and the use of scientifically-based procedures for selecting appropriate options for waste disposal. When applying these Guidelines uncertainties in relation to assessments of impacts on the marine environment will need to be considered and a precautionary approach applied in addressing these uncertainties. They should be applied with a view that acceptance of dumping under certain circumstances does not remove the obligation to make further attempts to reduce the necessity for dumping.	1.5 The Guidelines for the Assessment of Wastes or Other Matter that May be Considered for Dumping[1], referred to in short as the "Generic Guidelines," as well as Specific Guidelines for the Assessment of Carbon Dioxide Streams for Disposal into Sub-Seabed Geological Formations addressed in this document, are intended for use by national authorities responsible for regulating dumping of wastes and embody a mechanism to guide national authorities in evaluating applications for dumping of wastes in a manner consistent with the provisions of the London Convention 1972 or the 1996 Protocol thereto. Annex 2 to the 1996 Protocol places emphasis on progressively reducing the need to use the sea for dumping of wastes. Furthermore, it recognizes that avoidance of pollution demands rigorous controls on the emission and dispersion of contaminating substances and the use of scientifically-based procedures for selecting appropriate options for waste disposal. When applying these Guidelines uncertainties in relation to assessments of impacts on the marine environment will need to be considered and a precautionary approach applied in addressing these uncertainties. They should be applied with a view that acceptance of dumping under certain circumstances does not remove the obligation to make further attempts to reduce the necessity for dumping.	1.5 一般 WAG と略称される「投棄を検討できる廃棄物その他の物の評価のためのガイドライン」と同様、この文書で扱われる「海底下地質累層へ処分する二酸化炭素流の評価のための特定ガイドライン」は、廃棄物の投棄の規制に責任を有する国の機関が活用し得るものとして作成されており、国の機関が廃棄物投棄の申請書を審査するに当たり、ロンドン条約及びロンドン条約議定書の条項に適合する方法で行うよう指導するメカニズムを具体的に示したものである。議定書の附属書Ⅱは、廃棄物の投棄のために海洋を使用する必要性を徐々に減少させることを強調している。更に、附属書2は、汚染を避けるためには、汚染物質の放出及び拡散について厳格な管理を行い、かつ、科学的根拠に基づいた手続きを用いて廃棄物投棄の適切な方法を選択することが必要であるとの考えにたっている。本件ガイドラインの適用に当たっては、海洋環境への影響評価に係る不確実性を考慮する必要があり、こうした不確実性に対しては予防的取組みを適用する必要がある。本件ガイドラインは、一定の状況下で投棄を認めたとしても、投棄の必要性を減少させるため更なる努力を行う義務を免れるものではないとの考えに基づいて、適用されるべきである。
		1) The Nineteenth Consultative Meeting of Contracting Parties to the London Convention 1972 adopted these Guidelines in 1997.	注 1 1997 年に開催された、第 19 回 1972 年のロンドン条約締約国会合において、当該ガイドラインが採択された。
	2 The 1996 Protocol to the London Convention 1972 follows an approach under which dumping of wastes or other matter is prohibited except for those materials specifically enumerated in Annex I, and in the context of that Protocol, these Guidelines would apply to the materials listed in that Annex. The London Convention 1972 prohibits the dumping of certain wastes or other matter specified therein and in the context of that Convention these Guidelines meet the requirements of its Annexes for wastes not prohibited for dumping at sea. When applying these Guidelines under the London Convention 1972, they should not be viewed as a tool for the reconsideration of dumping of wastes or other matter in contravention of Annex I to the London Convention 1972.	1.6 The 1996 Protocol to the London Convention 1972 follows an approach under which dumping of wastes or other matter is prohibited except for those materials specifically enumerated in Annex 1, and in the context of that Protocol, these Guidelines would apply to the materials listed in that Annex. The London Convention 1972 prohibits the dumping of certain wastes or other matter specified therein and in the context of that Convention these Guidelines meet the requirements of its Annexes for wastes not prohibited for dumping at sea. When applying these Guidelines under the London Convention 1972, they should not be viewed as a tool for the reconsideration of dumping of wastes or other matter in contravention of Annex I to the London Convention 1972.	1.6 ロンドン条約議定書は、その附属書1に特に列挙された物以外の廃棄物その他の物の投棄は禁止されているところ、同議定書との関係においては、本件ガイドラインは附属書1に記載されている物に適用される。ロンドン条約は特定の廃棄物その他の物の投棄を禁止しており、同条約に関していえば、本件ガイドラインはその附属書で投棄が禁止されていない物に適用される。ロンドン条約の下で本件ガイドラインを適用するに当たっては、その附属書Ⅰに反する廃棄物その他の物の投棄を検討するために本件ガイドラインを活用すべきではない。
	3 The schematic shown in Figure 1 provides a clear indication of the stages in the application of the Guidelines where important decisions should be made and is not designed as a conventional "decision tree". In general, national authorities should use the	1.7 The schematic shown in Figure 1 provides a clear indication of the stages in the application of this guidance where important decisions should be made and is not designed as a conventional "decision tree". In general, national authorities should use the	1.7 図1の概念図には、本件ガイドラインの適用に当たって重要な決定がなされる各段階が明示されている。これは、従来の「決定図」とは異なっている。原則として、国の機関は同概念図を繰り返し活用し、許可発給の決定を下すに

	schematic in an iterative manner ensuring that all steps receive consideration before a decision is made to issue a permit. Figure 1 illustrates the relationship between the operational components of Annex 2 of the 1996 Protocol and contains the following elements:	schematic in an iterative manner ensuring that all steps receive consideration before a decision is made to issue a permit. Figure 1 illustrates the relationship between the operational components of Annex 2 of the 1996 Protocol and contains the following elements:	あたり、全ての検討事項が考慮されることを確保するべきである。図1は議定書の附属書2の実施要素間の関係を示しているが、以下の要素が含まれている。
	.1 Waste Characterization (paragraphs 10-11, Chemical, Physical and Biological Properties) .2 Waste Prevention Audit and Waste Management Options (paragraphs 5-9) .3 Action List (paragraphs 12-15) .4 Identify and Characterize Dump-site (paragraphs 16-28, Dump-site Selection) .5 Determine Potential Impacts and Prepare Impact Hypothesis(es) (paragraphs 29-39, assesment of Potential Effects) .6 Issue Permit (paragraphs 46-49, Permit and Permit Conditions) .7 Implement Project and Monitor Compliance (paragraphs 40-45, Monitoring) .8 Field Monitoring and Assessment (paragraphs 40-45, Monitoring.	.1 Carbon Dioxide Stream Characterization (Chapter 4, Chemical, Physical and Biological Properties); .2 Waste Prevention Audit and Waste Management Options (Chapter 2 and 3); .3 Action List (Chapter 5); .4 Identify and Characterize Sub-seabed geological formation (Chapter 6, Sub-seabed Geological Formation Selection); .5 Determine Potential Impacts and Prepare Impact Hypothesis(es) (Chapter 7, Assessment of Potential Effects); .6 Issue Permit (Chapter 9, Permit and Permit Conditions); .7 Implement Project and Monitor Compliance (Chapter 8, Monitoring); and .8 Field Monitoring and Assessment (Chapter 8, Monitoring).	.1 二酸化炭素流の特性把握（第4章、化学的、物理的及び生物学的特質） .2 廃棄物防止審査及び廃棄物管理手法（第2及び3章） .3 行動基準（第5章） .4 海底下地質累層の特定及び特性把握（第6章、海底下地質累層の選択） .5 潜在的影響の決定及び影響仮説の準備（第7章、潜在的影響の評価） .6 許可発給（第9章、許可及び許可条件） .7 投棄の実施及び遵守に関する監視（第8章、監視） .8 現場における監視及び環境影響評価（第8章、監視）
	4 These generic Guidelines are complemented by specific dredged material guidance (Dredged Material Assessment Framework, Resolution LC.52 (18)) and by further specific guidance developed for each waste category listed in Annex 1 to the 1996 Protocol to the London Convention 1972.		
	(Figure 1. Waste Assessment Framework)		
WASTE PREVENTION AUDIT 2 The initial stages in assessing alternatives to dumping should, as appropriate, include an evaluation of:	WASTE PREVENTION AUDIT 5 The initial stages in assessing alternatives to dumping should, as appropriate, include an evaluation of:	2 WASTE PREVENTION AUDIT 2.1 The initial stages in assessing alternatives to dumping should, as appropriate, include an evaluation of:	2 廃棄物防止評価 2.1 投棄に代わる処理方法を検討するための最初の段階においては、次の事項を必要に応じて適切に検討する必要がある。
.1 types, amounts and relative hazard of wastes generated; .2 details of the production process and the sources of wastes within that process; and .3 feasibility of the following waste reduction/ prevention techniques: .1 product reformulation; .2 clean production technologies; .3 process modification; .4 input substitution; and .5 on-site, closed-loop recycling.	.1 types, amounts and relative hazards of wastes generated; .2 details of the production process and the sources of wastes within that process; and .3 feasibility of the following waste reduction/ prevention techniques: .3.1 product reformulation; .3.2 clean production technologies; .3.3 process modification; .3.4 input substitution; and .3.5 on-site, closed-loop recycling.	.1 types, amounts and relative hazards of wastes generated; .2 details of the sources of wastes; and .3 the nature of incidental associated substances derived from the source material and the capture and sequestration processes used	.1 廃棄物の種類、量及び関連する危険性 .2 廃棄物発生源の詳細 .3 原料物質及び回収・隔離に採用された工程に由来する非意図的関連物質の性質
3 In general terms, if the required audit reveals that opportunities exist for waste prevention at source, an applicant is expected to formulate and implement a waste prevention strategy, in collaboration with relevant local and national agencies, which includes specific waste reduction targets and provision for further waste prevention audits to ensure that these targets are being met. Permit issuance or renewal decisions shall assure compliance with any resulting waste reduction and prevention requirements.	6 In general terms, if the required audit reveals that opportunities exist for waste prevention at source, an applicant is expected to formulate and implement a waste prevention strategy in collaboration with relevant local and national agencies which includes specific waste reduction targets and provision for further waste prevention audits to ensure that these targets are being met. Permit issuance or renewal decisions shall assure compliance with any resulting waste reduction and prevention requirements.	2.2 In general terms, if the required audit reveals that opportunities exist for waste prevention at source, an applicant is expected to formulate and implement a waste prevention strategy in collaboration with relevant local and national agencies which includes specific waste reduction targets and provision for further waste prevention audits to ensure that these targets are being met. Permit issuance or renewal decisions shall assure compliance with any resulting waste reduction and prevention requirements. *(Note:*	2.2 一般的に、必要な評価により、廃棄物の発生源において廃棄物の発生を防止するための機会が存在することが判明する場合には、申請者は、関係する地方及び国の機関と協力して、特定の廃棄物の削減目標及び当該目標が達成されることを確保するためのさらなる廃棄物発生防止評価を含む廃棄物防止戦略を作成し及び実施することが期待される。許可発給又は許可更新の決定は、そのような過程で作成される廃棄物の削減及び防止の要件が遵守されることを確保するものでなければならない。(注：本項は、

		This paragraph is not directly pertinent to the disposal of carbon dioxide streams into sub-seabed geological formations. However, it is important to acknowledge the obligation to take steps to prevent waste arising thereby reducing the need for disposal at sea.)	二酸化炭素流の海底下地質累層への廃棄に直接関係するものではない。しかし、発生する廃棄物防止のために方策を講じる義務を認識し、海洋処分の必要性を低減することは重要である。)
4 For dredged material and sewage sludge, the goal of waste management should be to identify and control the sources of contamination. This should be achieved through implementation of waste prevention strategies and requires collaboration between the relevant local and national agencies involved with the control of point and non-point sources of pollution. Until this objective is met, the problems of contaminated dredged material may be addressed by using disposal management techniques at sea or on land.	7 For dredged material and sewage sludge, the goal of waste management should be to identify and control the sources of contamination. This should be achieved through implementation of waste prevention strategies and requires collaboration between the local and national agencies involved with the control of point and non-point sources of pollution. Until this objective is met, the problems of contaminated dredged material may be addressed by using disposal management techniques at sea or on land.		
		2.3 For this category of material the most pertinent issue will be waste minimization[2].	2.3 当該物質にとって、最も関連のある（適切な）課題は、廃棄物の最少化[2]であろう。
		2) The minimization of the carbon dioxide streams should be considered in the context of national energy policy.	注 2 二酸化炭素流の最少化は、各国のエネルギー政策に合わせて考慮されるべきである。
CONSIDERATION OF WASTE MANAGEMENT OPTIONS	CONSIDERATION OF WASTE MANAGEMENT OPTIONS	3 CONSIDERATION OF WASTE MANAGEMENT OPTIONS	3 廃棄物管理手法についての検討
		3.1 Carbon dioxide sequestration in sub-seabed geological structures is a management option to be considered within the context of Contracting Parties' approaches to mitigating greenhouse gas emissions[3].	3.1 海底下地質構造への二酸化炭素隔離は、温室効果ガス排出削減に向けた各締約国の取組みの中で考慮されるべき一つの管理選択肢[3]である。
		3) This option includes CO_2 sequestration in depleted offshore oil and gas fields, but excludes normal oil and gas exploration operations, such as enhanced oil recovery.	注 3 本選択肢には、沖合の廃止油・ガス田への二酸化炭素隔離は含まれるが、石油増進回収法等のような、通常の石油ガス探査事業は含まれない。
5 Applications to dump wastes or other matter shall demonstrate that appropriate consideration has been given to the following hierarchy of waste management options, which implies an order of increasing environmental impact:	8 Applications to dump wastes or other matter shall demonstrate that appropriate consideration has been given to the following hierarchy of waste management options, which implies an order of increasing environmental impact:	3.2 Applications for disposal of carbon dioxide streams from carbon dioxide capture processes for sequestration into sub-seabed geological formations shall demonstrate that appropriate consideration was given to:	3.2 海底下地質累層への隔離のための二酸化炭素回収工程から得られる二酸化炭素流の処分の申請では、以下の点に適切な配慮が行われたことが示されなければならない。
.1 re-use; .2 off-site recycling; .3 destruction of hazardous constituents; .4 treatment to reduce or remove the hazardous constituents; and .5 disposal on land, into air and in water.	.1 re-use; .2 off-site recycling; .3 destruction of hazardous constituents; .4 treatment to reduce or remove the hazardous constituents; and .5 disposal on land, into air and into water.	.1 the control of sources of contamination of the carbon dioxide stream, and, if necessary, treatment to reduce or remove hazardous constituents; and .2 other disposal options.	.1 二酸化炭素流の汚染源の管理、並びに、必要に応じて、有害な構成成分の抑制又は除去のための処理 .2 その他の処分方法
6 A permit to dump wastes or other matter shall be refused if the permitting authority determines that appropriate opportunities exist to re-use, recycle or treat the waste without undue risks to human health or the environment or disproportionate costs. The practical availability of other means of disposal should be considered in the light of a comparative risk assessment involving both dumping and the alternatives.	9 A permit to dump wastes or other matter shall be refused if the permitting authority determines that appropriate opportunities exist to re-use, recycle or treat the waste without undue risks to human health or the environment or disproportionate costs. The practical availability of other means of disposal should be considered in the light of a comparative risk assessment involving both dumping and the alternatives.	3.3 A permit to allow the sequestration of carbon dioxide in sub-seabed geological structures shall be refused if the permitting authority determines that other appropriate disposal opportunities exist without undue risks to human health or the environment or disproportionate costs. The practical availability of other means of disposal should be considered in the light of a comparative risk assessment involving both dumping and the alternatives.	3.3 二酸化炭素を海底下地質構造へ隔離するための許可は、許可発給当局が、人の健康若しくは環境に対する不当な危険又は不均衡な費用を伴わずに適切に処分できる他の機会が存在すると判断する場合には、拒否されなければならない。他の処分方法の現実的可能性については、投棄と投棄に代わる処分方法の双方を含めたリスク評価結果を比較する観点から検討されるべきである。
CHEMICAL, PHYSICAL AND BIOLOGICAL PROPERTIES	CHEMICAL, PHYSICAL AND BIOLOGICAL PROPERTIES	4 CHEMICAL, PHYSICAL AND BIOLOGICAL PROPERTIES	4 化学的、物理的及び生物学的特質