Appendix C

Sequestration Liability Frameworks Enacted by States, Countries

OVERVIEW OF LIABILITY FRAMEWORKS

Following is an overview of the sequestration liability frameworks that we reviewed while researching the accompanying white paper.[1] Following this overview are tables describing each liability framework in detail.

U.S. States

Illinois

- Liability regime for FutureGen:[2]
    - Illinois will procure an insurance policy, at the state's expense, that insures the FutureGen operator against any losses stemming from a public liability action.
    - Illinois will indemnify the FutureGen operator from any loss not covered under such an insurance policy.
    - Exceptions: operator fully liable for intentional/willful misconduct; failure to comply with any applicable law, rule, or regulation; construction and pre-injection operation
- No liability regime has been enacted for other CCS projects in the state.

Kansas

- A state Carbon Dioxide Injection Well and Underground Storage Fund has been created that can be used for several purposes, including permitting activities, design and review of remedial action plans, mitigation of adverse environmental impacts, and emergency or long-term remedial activities.[3]
- Statutes and regulations do not provide for a transfer of liability to the state, although as noted above, the state may use fund money to pay for mitigation of adverse environmental impacts and long-term remedial activities. The operator is responsible for monitoring until the operator can demonstrate:
    - the CO2 plume has stabilized, is contained within the storage reservoir, and is not a threat to public health and safety and "usable" (defined as containing less than 10,000 milligrams of total dissolved solids per liter) water, and

[1] Several groups have compiled lists of U.S. state and foreign government actions regarding CCS: the Global CCS Institute at http://www.globalccsinstitute.com/, the CCSReg Project at http://www.ccsreg.org/, and the University College London Carbon Capture Legal Programme at http://www.ucl.ac.uk/cclp/index.php.

[2] 2007 Ill. Laws 18, §§ 15, 25, 30.

[3] KAN. STAT. ANN. § 55-1638 (2009).

- the CO2 storage reservoir pressure is stable.

- Upon this demonstration, the operator will plug all monitoring wells and the facility permit will be revoked.

Louisiana

- During operational period:
  - No financial assurance obligations;
  - Caps on civil liability actions for non-economic losses;[4]
  - Operator pays a per-ton fee into a state trust fund. The per-ton fee is calculated so that the operator pays $5 million into the fund over 10 years. After there is $5 million in the trust fund with respect to a storage operator, the operator stops paying fees. However, if at any point there is less than $4 million in the trust fund with respect to a storage operator, fee collection from that operator will resume.[5]
- Transfer:
  - Ownership of the site and the stored CO_2 may transfer to the state no sooner than 10 years after cessation of injection, if the operator can show that the reservoir is "reasonably expected to retain mechanical integrity and the carbon dioxide will reasonably remain emplaced."[6]
  - Operator, CO_2 generators, and owners of the stored CO_2 are then released from liability, unless the trust fund contains inadequate funds to address any liability that may arise, or if the operator, owner, or generator intentionally and knowingly concealed or intentionally or knowingly misrepresented material facts related to the mechanical integrity of the storage facility or the chemical composition of any injected CO_2.[7]
  - No release of liability if the state trust fund is depleted.[8]

Montana

- During operational period:
  - bond or other surety is required;[9]
  - no caps on liability; and

[4] LA. REV. STAT. ANN. § 30:1109(B) (2010).

[5] *Id.* § 30:1110(C).

[6] *Id.* § 30:1109(A)(1).

[7] *Id.*

[8] *Id.* § 30:1109(A)(2).

[9] MONT. CODE ANNO. § 82-11-123(1)(f) (effective on the date that Montana's board of oil and gas conservation is granted primacy to administer activities at carbon dioxide sequestration wells by the U.S. EPA).

- O/O pays per-ton fee in an amount set by board rule, to be based on the anticipated actual expenses that the state will incur in monitoring and managing geologic storage reservoirs in the post-closure phase.[10]

- Transfer:
  - 15 years after injections end, the state will issue certificate of completion if O/O meets certain requirements.
  - After another 15 years, O/O may transfer title to the state if certain requirements are met.[11]

North Dakota

- While the O/O holds title to the CO_2, the O/O is liable for any damage the CO_2 may cause, including damage caused by CO_2 that escapes from the storage facility.[12]
- Two funds:
  - Administrative Fund: O/O pays (1) permit application fees and (2) per-ton fees, based on the state's anticipated cost of regulating sites during their construction, operational, and pre-closure phases. Expenditures from this fund limited to expenses relating to the construction, operational, and pre-closure phases.[13]
  - Trust Fund: O/O pays an additional per-ton fee into the Trust Fund, based on the state's anticipated expenses associated with long-term monitoring and management of a closed site. Expenditures from this fund limited to expenses relating to the post-closure phase.[14]
- Transfer:
  - 10 years after injections end, if O/O meets certain criteria, title to the storage facility and the stored CO_2 transfers, without payment of any compensation, to the state.[15]
  - Title acquired by the state includes all rights and interests in, and all responsibilities associated with, the stored CO_2.[16]

Oklahoma

- The agencies with jurisdiction over sequestration may issue and enforce orders and rules, including establishing fees, financial sureties or bonds, and monitoring at CO_2 sequestration facilities.[17]

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[10] *Id.* § 82-11-181.

[11] *Id.* § 82-11-183.

[12] N.D. CENT. CODE § 38-22-16 (2010).

[13] *Id.* §§ 38-22-05, -14, -23.

[14] *Id.* § 38-22-15.

[15] *Id.* § 38-22-16.

[16] *Id.* § 38-22-17.

- Unless otherwise expressly provided for, CO_2 injected into a sequestration facility is the personal property of the facility owner.[18]

Texas

- State may require permit holder to maintain a performance bond or other form of financial security.[19]
- Offshore sequestration:
    - Title to the sequestered CO_2 will pass to the state's permanent school fund on a determination by the state's School Land Board that permanent storage has been verified and that the storage location has met all applicable state and federal requirements.[20]
    - The transfer of title does not relieve a producer of CO_2 of liability for any act or omission regarding the generation of stored CO_2 performed before the CO_2 was stored.[21]
- Anthropogenic Carbon Dioxide Storage Trust Fund:
    - State may impose fees to cover the costs of permitting, monitoring, and inspecting CO_2 wells and geological storage facilities, and for enforcing and implementing the statute and rules.[22]
    - These fees, and penalties imposed for violations, will be deposited into the fund.[23]
    - Fund can only be used for certain enumerated purposes, which do not appear to include paying damage claims.[24]

Utah

- By January 1, 2011, Utah's Division of Water Quality and Division of Air Quality, in collaboration with Utah's Public Services Commission, Division of Oil, Gas and Mining, and the Utah Geological Survey, must present recommended rules regarding CCS to the state legislature.
- The recommended rules must address, among other things, issues concerning ownership of subsurface rights and pore space and short- and long-term liability and indemnification for sequestration sites.[25]

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[17] OKLA. STAT. tit. 27A, § 3-5-104 (2009)

[18] *Id.* § 3-5-105.

[19] TEX. WATER CODE ANN. § 27.073 (2009).

[20] TEX. HEALTH & SAFETY CODE ANN. § 382.507 (2009).

[21] *Id.* § 382.508.

[22] TEX. WATER CODE ANN. § 27.045.

[23] TEX. NAT. RES. CODE ANN. § 120.003 (2009).

[24] *Id.*

[25] UTAH CODE ANN. § 54-17-701 (2009).

Washington

- Financial assurance mechanisms are required (sufficient to cover cost to the state of abandonment of the project or remediation of leaks if the O/O does not perform as required or ceases to exist).[26]

- O/O will monitor throughout the post-closure period. The post-closure period will continue until the state determines that modeling and monitoring demonstrate that there is little or no risk of future environmental impacts, and there is high confidence in the effectiveness of the containment system and related trapping mechanisms.[27]

- There does not appear to be transfer of liability, either for damages or for monitoring, to the state.

West Virginia

- The state's Department of Environmental Protection will promulgate rules regarding, among other things, the necessary financial assurance procedures and the proper duration of the post-closure care period for sequestration sites.[28]

- A sequestration permit application must include proof of financial assurance to ensure that sequestration sites and facilities will be constructed, operated and closed in accordance with the statute and rules, and a detailed plan for post-closure monitoring, verification, accounting, maintenance and mitigation.[29]

- Carbon Dioxide Sequestration Working Group was formed to develop a long-term strategy for the regulation of CO_2 sequestration in West Virginia.[30]

Wyoming

- Permit applicant must have public liability insurance policy in force which provides for personal injury and property damage protection, or self-insurance.[31]

- State will allow for release of bonds or termination of insurance instruments no sooner than 10 years after injections have ceased, wells have been closed, when O/O received a certificate from the state certifying that:

> "plume stabilization as defined by rule has been achieved without the use of control equipment based on a minimum of three consecutive years of monitoring data, and that the operator has completed site reclamation and all required monitoring and remediation sufficient to show that the CO_2 injected into the geologic sequestration

[26] WASH. ADMIN. CODE § 173-218-115 (2010).

[27] *Id.*

[28] W. VA. CODE § 22-11A-4(a) (2009).

[29] *Id.* § 22-11A-5(a)(10)-(11).

[30] *Id.* § 22-11A-6(e).

[31] WYO. STAT. ANN. § 35-11-313(f)(ii)(O) (2010).

site will not harm or present a risk to human health, safety or the environment, including drinking water supplies."[32]

- Wyoming does not assume liability for geologic sequestration sites or the CO_2.[33]

- Wyoming has created a special revenue account, to be funded by per-ton fees or closure fees, for purposes of post-closure MMV only.[34]

Foreign jurisdictions

European Union

- The EU Directive on CCS applies to both onshore and offshore sequestration.[35]

- Operational phase:

    - Financial security is required and will be periodically adjusted.[36] O/O must submit annually proof of the maintenance of the financial security.[37]

- Transfer:

    - Transfer to the "competent authority" may occur no sooner than 20 years after injections end, if "all available evidence indicates that the stored CO_2 will be completely and permanently contained."[38]

    - O/O pays closure assessment to cover anticipated costs of monitoring for 30 years after the transfer to the competent authority.[39]

    - There are exceptions to transfer of liability for deficient data, concealment of relevant information, negligence, willful deceit, or a failure to exercise due diligence.[40]

- Competent authority may withdraw a storage permit:

    - if it has been notified or made aware of any leakages or significant irregularities;

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[32] *Id.* § 35-11-313(f)(vi).

[33] *Id.* § 35-11-318(d).

[34] *Id.* § 35-11-318(a)-(c).

[35] Council Directive 2009/31/EC, art. 2, 2009 O.J. (L 140).

[36] *Id.* art. 19.

[37] *Id.* art. 14.

[38] *Id.* art. 18.

[39] *Id.* art. 20.

[40] *Id.* art. 18(7).

- if annual reports and annual environment inspections show non-compliance with permit conditions or risks of leakages or significant irregularities;
- if it is aware of any other failure by the operator to meet the permit conditions;
- if it appears necessary on the basis of the latest scientific findings and technological progress; or
- without prejudice to points (a) to (d), five years after issuing the permit and every 10 years thereafter.[41]

- If a permit is withdrawn, the competent authority will either issue a new permit or close the site. Until a new storage permit is issued, the competent authority will temporarily take over all legal obligations relating to acceptance criteria where the competent authority decides to continue CO_2 injections, monitoring and corrective measures, the surrender of allowances in cases of leakage, and preventive and remedial action. The competent authority will recover any costs incurred from the former operator.[42]

Australia:

- The Commonwealth of Australia has enacted a liability framework for offshore sequestration.[43] The states of Victoria and Queensland have enacted liability frameworks for onshore sequestration within their respective states.[44]

- After Australia issues a site closing certificate for a site, the Commonwealth will undertake monitoring activities, with costs and expenses to be reimbursed by the site owner/operator.[45]

- Beginning 15 years after the issuance of a site closing certificate, the Commonwealth will indemnify the owner/operator against liability for damages with respect to the site. If, at this time, the owner/operator of the site has ceased to exist, the Commonwealth will assume liability for damages with respect to the site.[46]

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[41] *Id.* art. 11(3).

[42] *Id.* art. 11(4).

[43] *Offshore Petroleum Amendment (Greenhouse Gas Storage) Act 2008*, No. 17, 2008, available at http://www.ucl.ac.uk/cclp/pdf/AustraliaOffshorePetroleumAmendmentAct2008.pdf.

[44] Victoria's *Greenhouse Gas Geological Sequestration Act 2008*, No. 61 of 2008, available at http://www.legislation.vic.gov.au/Domino/Web_Notes/LDMS/PubStatbook.nsf/51dea49770555ea6ca256da4001b90cd/7E4801FE0E8E3A55CA2574F80019A141/$FILE/08-61a.pdf; and Queensland's *Greenhouse Gas Storage Act 2009*, Act No. 3 of 2009, available at http://www.legislation.qld.gov.au/LEGISLTN/ACTS/2009/09AC003.pdf. Victoria also enacted regulations on December 1, 2009, *Greenhouse Gas Geological Sequestration Regulations 2009*, S.R. No. 149/2009. Western Australia also passed legislation establishing permitting procedures for CO_2 storage operations at Barrow Island's Gorgon project.

[45] *Offshore Petroleum Amendment (Greenhouse Gas Storage) Act 2008*, No. 17, 2008, §§ 249CZGA, 249CZM.

[46] *Id.* §§ 249CZN, 249CZO.

Illinois

Liability during operations *–Liability assurance required?* *–Indemnity or caps on liability?*	Liability assurance required. If private insurance is available, the state will procure an insurance policy that insures the FutureGen operator against any "qualified loss" (see below) stemming from a "public liability" (see below) action. The State will pay any such insurance premium, deductible or liability. It is intended that the State will use proceeds from emission reduction rights or tradable credits to pay for such insurance.47 "Qualified loss" does not include: (1) the intentional or willful misconduct of the FutureGen operator, (2) the FutureGen operator's failure to comply with any applicable law, rule, regulation or other State or federal requirement for CCS, or (3) the pre-injection operation of the FutureGen Project.48 "Public liability" means any civil legal liability arising out of or resulting from the storage, escape, release, or migration of the post-injection sequestered gas that was injected during the operation of the FutureGen Project by the FutureGen Alliance. The term "public liability" does not include legal liability arising out of or resulting from the construction, operation, or other pre-injection activity of the FutureGen operator.49 Indemnity. The State will indemnify, hold harmless, defend and release the FutureGen operator from and against any qualified loss (the exclusions above apply) stemming from a public liability action (a written demand, lawsuit, or claim from any third party received by the Operator seeking a remedy or alleging liability on behalf of Operator resulting from any public liability).50
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	The FutureGen operator will transfer to the state (with no payment due from the state) any liabilities associated with the sequestered gas "upon such gas reaching the status of post-injection, which shall be verified by the Agency or other designated State of Illinois agency."[51]
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum,*	No fund.

[47] 2007 Ill. Laws 18, § 25.

[48] *Id.* § 25(g).

[49] *Id.* § 15.

[50] *Id.* §§ 15, 30.

[51] *Id.* § 20.

maximum balances?	
Exception for negligence, etc.	Yes. State will not indemnify any public liability arising out of or relating to (1) the intentional or willful misconduct of the FutureGen operator, (2) the FutureGen operator's failure to comply with any applicable law, rule, regulation or other State or federal requirement for CCS, or (3) the pre-injection operation of the FutureGen Project.[52]
Long-term monitoring	Not addressed.
CO_2 ownership	The FutureGen operator will retain all rights, title, and interest in and to the pre-injection sequestered gas.[53] Upon the gas "reaching the status of post-injection, which shall be verified by the Agency," the State will accept and receive (with no payment due from the state) all rights, title, and interest in and to the sequestered gas.[54]
EOR	Not addressed.
Statutes, acts, regulations, rules reviewed	Clean Coal FutureGen for Illinois Act, 2007 Ill. Laws 18 (providing the FutureGen Alliance with liability protection and permitting certainty to facilitate the siting of the FutureGen Project in Illinois). Clean Coal Portfolio Standard Law, 2007 Ill. Laws 1027.

[52] *Id.* §§ 15, 30.

[53] Note: This wording ("pre-injection sequestered gas") seems unclear, because gas is only sequestered *after* it has been injected. The correct wording may be "pre-injection *captured* gas."

[54] 2007 Ill. Laws 18, § 20.

Kansas

Liability during operations *–Liability assurance obligations?* *–Indemnity or caps on liability?*	Liability rests with the operator. The operator's permit requirement must include demonstration of financial responsibility (in form and amount approved by the state) to ensure proper operation and closure of the CO_2 storage facility.[55] If a permit is transferred, the transferee must provide proof of financial responsibility.[56]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	After injections end, the operator must continue monitoring until it can demonstrate that both of the following conditions are met: (1) the CO_2 plume has stabilized, is contained within the storage reservoir, and is not a threat to public health and safety and usable water (defined as water containing not more than 10,000 mg of total dissolved solids per liter); and (2) the CO_2 storage reservoir pressure is stable. Upon this demonstration, the operator will plug the remaining monitoring wells, and the storage facility permit will be revoked.[57]
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum amounts?*	Carbon Dioxide Injection Well and Underground Storage Fund may be used for several purposes, including permitting activities, design and review of remedial action plans, mitigation of adverse environmental impacts, and emergency or long-term remedial activities.[58] Fees paid into the fund include: • $4,500 for a storage facility permit application, plus $100 for each CO_2 storage well included in the application • $250 for an application to amend a storage facility permit • $1000 annual fee for each active or inactive unplugged CO_2 storage well • Quarterly fee of 5 cents per ton of CO_2 injected
Exceptions for negligence, etc.	n/a
Long-term monitoring	As noted above, the operator's responsibility for monitoring ends upon certain demonstrations that the plume has stabilized and is not a threat to public health and safety or to usable water, and the storage reservoir pressure is stable.[59] There is no specific provision for monitoring after this time.

[55] KAN. ADMIN. REGS. § 82-3-1101(c)(15) (2010.

[56] *Id.* § 82-3-1104(c).

[57] *Id.* § 82-3-1117.

[58] KAN. STAT. ANN. § 55-1638 (2009).

[59] KAN. ADMIN. REGS. § 82-3-1117.

CO_2 ownership	Not addressed.
EOR	EOR sites are regulated as CCS sites. Defines "carbon dioxide injection well" as "any hole or penetration of the surface of the earth used to inject carbon dioxide for underground storage *or for enhanced recovery of hydrocarbons* and any associated machinery and equipment used for such injection of carbon dioxide." Rules and regulations adopted under the act will apply to any "carbon dioxide injection well" or underground storage, whether in existence on effective date of act or thereafter.[60]
Statutes, acts, regulations, rules reviewed	Carbon Dioxide Reduction Act, 2007 Kan. Sess. Laws 73. KAN. ADMIN. REGS. §§ 82-3-1100 et seq., 82-3-311a (2010).

[60] KAN. STAT. ANN. § 55-1637(a)(1), (g).

Louisiana

Liability during operations *–Liability assurance obligations?* *–Indemnity or caps on liability?*	Operator is liable until ownership transfers to the state, no sooner than 10 years after injections cease. No liability assurance obligations. Caps on civil liability actions against the owner or operator of a storage facility, CO_2 transmission pipeline, or the generator of the CO_2, as follows: –Cap is $250,000 per occurrence on compensatory damages for noneconomic loss. However, if damages were for wrongful death; permanent and substantial physical deformity; loss of use of a limb or loss of a bodily organ system; or permanent physical or mental functional injury that permanently prevents the injured person from being able to independently care for himself and perform life-sustaining activities, cap is $500,000 per occurrence.[61] –If above limits, or the application to any person or circumstance, are determined to be unconstitutional or otherwise invalid, maximum amount recoverable as damages for noneconomic loss is capped at $1 million per occurrence.[62]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	Liability transfers to the state no sooner than 10 years after cessation of injection. Certification: Certificate of completion is issued 10 years after cessation of injection. Certificate issued upon showing by storage operator that the reservoir is "reasonably expected to retain mechanical integrity and the carbon dioxide will reasonably remain emplaced."[63] A public hearing is required before a certificate can be issued.[64] Transfer of liability: Upon issuance of the certificate, ownership to the remaining project, including the stored CO_2, transfers to the state. Storage operator, all generators of any injected CO_2, all owners of CO_2 stored in the storage facility, and all owners otherwise having any interest in the storage facility will be released from all duties or obligations under this chapter and all liability associated with or related to that storage facility which arises after the issuance of the certificate of completion of injection operations.[65] Caps on liability after transfer: The state shall not assume or have any liability by the mere act of assuming ownership of a storage facility after issuance of a certificate.[66] The state will not be responsible for paying any costs associated with site restoration from any source other than the funds or trusts created by this chapter, and the state will have no responsibility to pay for restoration if the trust fund contains insufficient funds. Operator's release from liability upon issuance of the

[61] LA. REV. STAT. ANN. § 30:1109(B)(1) (2010).

[62] *Id.* § 30:1109(B)(2).

[63] *Id.* § 30:1109(A)(1).

[64] *Id.* § 30:1107(A).

[65] *Id.* § 30:1109(A)(1).

[66] *Id.* § 30:1109(A)(4).

	certificate will not occur if the trust fund contains inadequate funds to address or remediate any duty, obligation or liability that may arise.[67] No release from liability if trust fund (see below) is depleted.[68]
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum amounts?*	Louisiana has created the Carbon Dioxide Geologic Storage Trust Fund.[69] Fees paid in: Monies paid into the trust fund include fees assessed on storage operators. The monthly fee is calculated at a dollar-per-ton amount that will equal $5 million over 10 years. The fee may be redetermined at the end of a fiscal year based upon the estimated cost of administering and enforcing the statute, divided by the tonnage of CO_2 expected to be injected during the coming year; subject to a $5 million-per-storage-facility cap.[70] Other fees deposited into the fund include an annual regulatory fee of up to $50,000 for each storage facility that has not received a certificate of completion of injection operations (based upon the annual projected costs for oversight and regulation), and an application fee.[71] Authorized uses: The fund will be used solely for the following purposes: operational and long-term inspecting, testing, and monitoring of the site, including remaining surface facilities and wells; remediation of mechanical problems associated with remaining wells and surface infrastructure; repairing mechanical leaks at the site; plugging and abandoning remaining wells or conversion for use as observation wells; administration of this chapter (up to $750,000/year); fees and costs associated with the administration of the fund or site-specific accounts; and/or fees and costs associated with the acquisition of insurance for future storage facility liability. Fund money can also be used for R&D in connection with carbon sequestration and methods. Minimum/maximum amounts: Once the operator has paid $5 million into the fund, fee assessments stop until fund money is expended for monitoring and caretaking of *any* completed storage facility. If the fund falls below $4 million for the storage operator, the commissioner can resume collecting fees.[72] Enforcement: The provisions of the Louisiana Tax Code will apply to the administration, collection, and enforcement of the fees imposed, and the Tax Code penalties will apply to any person who fails to pay or report the fees.[73]

[67] *Id.* § 30:1109(A)(2), (C).

[68] *Id.* § 30:1109(A)(2).

[69] *Id.* § 30:1110.

[70] *Id.* § 30:1110(C). Note that throughout this section of the statute, the fees are assessed per operator ("Once a storage operator has contributed five million dollars to the trust fund, the fee assessments to that storage operator under this Section shall cease…"), but it seems as though the intent is to have $5 million in the trust fund for each facility ("The total fee assessed shall be sufficient to assure a balance in the fund not to exceed five million dollars for any active storage facility within the state…"). *Id.* § 30:1110(C)(1)(f)-(g). In other words, if one storage operator operates more than one facility, the formula may not lead to sufficient amounts being placed in the fund.

[71] *Id.* § 30:1110(C)(2)-(3).

[72] *Id.* § 30:1110(C).

[73] *Id.* § 30:1110(D).

	Site-specific trust accounts. If a storage facility site is transferred from one party to another (except for transfer to the state), the parties may establish a site-specific trust account to provide a source of funds for long-term maintenance, monitoring, and site closure or remediation. If parties elect this, a storage facility long-term maintenance, monitoring, and site closure assessment will be made (by a contractor approved by the commissioner) to estimate what funds are required to be placed into the account. The funds in each account remain the property of the commissioner. Once the commissioner has approved the site-specific trust account, and the account is fully funded, the transferring party and all prior owners, operators, and working interest owners will not thereafter be held liable by the state for any site closure costs or actions associated with the transferred storage facility. However, the failure of a transferring party to make a good faith disclosure of all material storage facility site conditions existing at the time of the transfer may render that party liable for the costs to address such undisclosed conditions in excess of the balance of the site-specific trust fund. If the parties do not establish a site-specific trust account, there is no exemption from liability for the transferring party.[74]
Exception for negligence, etc.	Release from liability will not apply to the owner or operator of a storage facility, CO_2 transmission pipeline, or the generator of the CO_2 being handled by either the facility or pipeline if it is demonstrated that any such owner, operator, or generator intentionally and knowingly concealed or intentionally or knowingly misrepresented material facts related to the mechanical integrity of the storage facility or the chemical composition of any injected CO_2.[75]
Long-term monitoring	Upon issuance of the certificate of completion of injection operations, continued monitoring, including remediation of any well leakage, shall become the principal responsibility of the Carbon Dioxide Geologic Storage Trust Fund.[76]
CO_2 ownership	During operations, ownership of CO_2 is a matter of private contract between the storage operator and owner, shipper or generator of CO_2, as applicable.[77]
EOR	Nothing in the new CCS statute "shall prevent an enhanced oil and gas recovery project utilizing injection of carbon dioxide as approved under R.S. 30:4."[78] EOR operation can be converted into a storage facility.[79]
Other	Upon approval of 2/3 of the members of the State Mineral and Energy Board (the "Board"), the Board may enter into operating agreements whereby the state receives a share of revenues from the storage of CO_2 and assumes all or a portion of the risk of the cost of the activity, where the Board determines it is in the best interest of the state either in equity or in the promotion of conservation to do so.[80]

[74] *Id.* § 30:1111.

[75] *Id.* § 30:1109(A)(3).

[76] *Id.* § 30:1109(A)(3).

[77] *Id.* § 30:1103(10).

[78] *Id.* § 30:1104(A)(8).

[79] *Id.* § 30:1104(A)(9).

[80] *Id.* § 30:209(4)(e).

Statutes, acts, regulations, rules reviewed	Act of June 17, 2008, 2008 La. Acts 315 (regulating CO_2 storage under underground natural gas storage regime and providing for the state to lease state land, either onshore or offshore, for CCS). Act of June 30, 2008, 2008 La. Acts 610 (providing that state may enter into operating agreements to share in risks and revenues of CO_2 storage facility). Act of July 10, 2009, 2009 La. Acts 517 (enacting legal framework for CCS, including Geologic Storage Trust Fund and site-specific trust accounts).

Montana

Liability during operations *–Liability assurance requirement?* *–Indemnity or caps on liability?*	Until (1) a certificate of project completion is issued and (2) title to the stored CO_2 and the reservoir is transferred to the state, the operator is liable for the operation and management of the CO_2 well, the reservoir, and the injected or stored CO_2.[81] Liability assurance requirement. The board will require the furnishing of reasonable bond or other surety for a CO_2 injection well, reservoir, and the CO_2 stored in the reservoir with good and sufficient surety for performance of the duty to operate and manage a CO_2 injection well, reservoir, and the CO_2 stored in the reservoir and to properly plug and reclaim each CO_2 injection well. The bond or other surety may be forfeited in its entirety by the board for failure to perform the duty to properly manage and operate a well, reservoir, and stored CO_2 or to plug a well. The bonds or other surety may not be canceled or absolved, except when title is transferred to the state through the process described below, which will occur no sooner than 30 years after injections end.[82]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	Liability may transfer to the state through a two-part process. Operator retains liability for at least 30 years after CO_2 injections end, during two stages that last at least 15 years each: Post-closure certification process. 15 years after CO_2 injections end, the state will issue a "certificate of completion" if operator: (a) is in full compliance with regulations governing the reservoir; (b) shows that the reservoir "will retain" the CO_2 stored in it; (c) shows that all wells, equipment and facilities to be used in the post-closure period are in good condition and retain mechanical integrity; (d) shows that it has plugged wells, removed equipment and facilities, and completed reclamation work as required by the board; (e) shows that the CO_2 in the reservoir "has become stable, which means that it is essentially stationary or chemically combined or, if it is migrating or may migrate, that any migration will not cross the GS reservoir boundary"; and (f) shows that the operator will continue to provide adequate bond or other surety after receiving the certificate of completion for at least 15 years following issuance of the certificate of completion and that the operator continues to accept liability for the reservoir and the stored CO_2. Transfer of title. 15 years after the certificate of completion, the operator may transfer title to the reservoir and the stored CO_2 to the state if monitoring shows: (a) the reservoir and wells are in full compliance with regulations; and (b) the reservoir will maintain its structural integrity and will not allow CO_2 to move out of one stratum to another or pollute drinking water supplies. If title is transferred, the operator and all persons who injected CO_2 are released

[81] MONT. CODE ANN. § 82-11-182 (effective on the date that Montana's board of oil and gas conservation is granted primacy to administer activities at carbon dioxide sequestration wells by the U.S. EPA).

[82] *Id.* § 82-11-123(1)(f).

	from liability associated with the reservoir and the stored CO_2. If the operator is not in compliance with the requirements, the operator retains liability until it is able to meet the requirements.[83] Once liability is transferred, the state is responsible for monitoring and managing the site until the federal government assumes responsibility for the long-term monitoring and management of geologic storage reservoirs and stored CO_2.[84] No caps on liability after transfer.
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum balances?*	Operators pay a per-ton fee, in an amount set by board rule, on CO_2 injected for storage. The amount will be based on the anticipated actual expenses that the board will incur in monitoring and managing geologic storage reservoirs in the post-closure phases.[85]
Exception for negligence, etc.	Not addressed.
Long-term monitoring	Operator monitors for 30 years after CO_2 injections end, as described above. After that, unless (1) operator chooses to retain title, or (2) the operator is found not to be in compliance with requirements that the operator show the reservoir will maintain its structural integrity, the state will be responsible for monitoring until the fed government assumes responsibility for the long-term monitoring and management of reservoirs and stored CO_2.[86]
CO_2 ownership	CO_2 ownership during operations is not specifically addressed. However, the storage operator is *liable* for the injected or stored CO_2 until title to the CO_2 is transferred to the state pursuant to the closure procedures. Upon transfer of liability to the state, the state accepts title to the CO_2.[87]
EOR	An EOR well may be converted into a CO_2 injection well. Owner of a converted well must pay a fee equivalent to the fee required to be paid by a GS operator.[88]
Statutes, acts, regulations, rules reviewed	Act of May 6, 2009, 2009 Mont. Laws 474 (regulating carbon sequestration).

[83] *Id.* § 82-11-183.

[84] *Id.* § 82-11-183(8)(e).

[85] *Id.* § 82-11-181.

[86] *Id.* § 82-11-183.

[87] *Id.* § 82-11-182.

[88] *Id.* § 82-11-184.

North Dakota

Liability during operations *–Liability assurance obligations?* *–Indemnity or caps on liability?*	While the storage operator holds title to the CO_2, the operator is liable for any damage the CO_2 may cause, including damage caused by CO_2 that escapes from the storage facility.[89]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	Industrial Commission issues a certificate of project completion when the following criteria are met: upon application by the storage operator; at least 10 years after CO_2 injections end; after public notice and hearing; after the Industrial Commission has consulted with the state Department of Health; and if the storage operator: • is in full compliance with all laws governing the storage facility; • shows that it has addressed all pending claims regarding the storage facility's operation; • shows that the storage reservoir is reasonably expected to retain the CO_2 stored in it; • shows that the CO_2 in the storage reservoir has become stable ("stable" = if it is essentially stationary or, if it is migrating or may migrate, that any migration will be unlikely to cross the storage reservoir boundary); • shows that all wells, equipment, and facilities to be used in the post-closure period are in good condition and retain mechanical integrity; and • shows that it has plugged wells, removed equipment and facilities, and completed reclamation work as required by the commission.[90] Once a certificate of project completion has been issued: title to the storage facility and to the stored CO_2 transfers, without payment of any compensation, to the state; title acquired by the state includes all rights and interests in, and all responsibilities associated with, the stored CO_2; the storage operator and all persons who generated any injected CO_2 are released from all regulatory requirements associated with the storage facility;

[89] N.D. CENT. CODE § 38-22-16 (2010).

[90] *Id.* § 38-22-17.

	any bonds posted by the storage operator must be released; and monitoring and managing the storage facility is the state's responsibility to be overseen by the commission until such time as the federal government assumes responsibility for the long-term monitoring and management of storage facilities.[91]
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum balances?*	Two funds: Carbon Dioxide Storage Administrative Fund (the "Administrative Fund") and the Carbon Dioxide Trust Fund (the "Trust Fund"): Administrative Fund: Permit application fees are deposited into the Administrative Fund. Fees must be based on the state Industrial Commission's anticipated cost of processing permit applications.[92] Storage operators also pay into the Administrative Fund a fee, set by Industrial Commission rule, on each ton of CO_2 injected for storage. This per-ton fee must be based on the Commission's anticipated expenses that it will incur in regulating storage facilities during their construction, operational, and preclosure phases.[93] Money in the Administrative Fund may be used only for: • defraying the Commission's expenses in processing permit applications; • regulating storage facilities during their construction, operational, and preclosure phases; • making storage amount determinations (under a cap-and-trade or similar system, the Commission will, for a fee and upon request, make determinations of the amount of CO_2 stored; these fees are deposited into the Fund); and • compensating another state agency that carries out regulatory responsibilities with respect to a storage facility pursuant to a cooperative agreement with the Industrial Commission.[94] Trust Fund. Storage operators pay into the Trust Fund an additional per-ton fee, set by Industrial Commission rule. This per-ton fee must be based on the Commission's anticipated expenses associated with the long-term monitoring and management of a closed storage facility. Money in the Trust Fund may only be used for: • defraying expenses the Commission incurs in long-term monitoring and management of a closed storage facility; and • compensating another state agency that carriers out regulatory responsibilities with respect to a storage facility pursuant to a cooperative agreement with the Industrial Commission.[95]
Exception for	There do not appear to be any exceptions to the transfer of title for gross negligence,

[91] *Id.* § 38-22-17(6).

[92] *Id.* § 38-22-05.

[93] *Id.* § 38-22-14(1).

[94] *Id.* §§ 38-22-14, 38-22-23.

[95] *Id.* § 38-22-15.

negligence, etc.	etc.
Long-term monitoring	After the state issues a certificate of project completion, monitoring and managing the storage facility is the state's responsibility to be overseen by the commission until such time as the federal government assumes responsibility for the long-term monitoring and management of storage facilities.[96]
CO_2 ownership	The storage operator has title to the CO_2 injected into and stored in a storage reservoir and holds title until the Commission issues a certificate of project completion.[97]
EOR	Applications to use CO_2 for EOR are processed under a separate section of the North Dakota Century Code. The Commission may allow an EOR project to be converted to a storage facility, in which case the CCS provisions of the Code would apply, but the Commission may waive such provisions and impose additional ones if unique circumstances arise.[98]
Statutes, acts, regulations, rules reviewed	Act of April 8, 2009, 2009 N.D. Laws 318 (providing for permitting and unitization for sequestration). Act of April 8, 2009, 2009 N.D. Laws 401 (relating to ownership of subsurface pore space). Act of April 8, 2009, 2009 N.D. Laws 576 (exempting EOR projects that use CO_2 from oil extraction tax).

[96] *Id.* § 38-22-17(6).

[97] *Id.* § 38-22-16.

[98] *Id.* § 38-22-19.

Oklahoma

Liability during operations *–Liability assurance required?* *–Indemnity or caps on liability?*	The Agency having jurisdiction[99] may issue and enforce such orders and rules, including establishment of appropriate and sufficient fees, financial sureties or bonds, and monitoring at CO_2 sequestration facilities, for regulating the drilling of CO_2 injection wells, the injection and withdrawal of CO_2, the operation of the CO_2 sequestration facility, CO_2 injection well plugging and abandonment, removal of surface buildings and equipment of the CO_2 sequestration facility and for any other purpose necessary to implement the provisions of this act. [100]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	Not specifically addressed. See "Liability during operations," above.
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum balances?*	No fund.
Exception for negligence, etc.	n/a
Long-term monitoring	Not specifically addressed.
CO_2 ownership	Unless otherwise expressly provided, CO_2 injected into a CO_2 sequestration facility is considered to be the personal property of the facility owner. Absent a final judgment of willful abandonment rendered by a court of competent jurisdiction, or a regulatory determination of willful abandonment, CO_2 injected into a CO_2 sequestration facility is not considered to be the property of the owner of the surface or mineral estate in the land encompassing the geographic boundary of the CO_2 sequestration facility.[101]

[99] The Agency having jurisdiction is the Corporation Commission for sequestration into oil or gas reservoirs, coal-bed methane reservoirs, and mineral brine reservoirs; and the Department of Environmental Quality for sequestration into all other reservoirs, including deep saline formations, unmineable coal seams where methane is not produced, basalt reservoirs, salt domes, and non-mineral bearing shales. OKLA. STAT. tit. 27A, § 3-5-103 (2009).

[100] *Id.* § 3-5-104.

[101] *Id.* § 3-5-105.

EOR	Statute states that "additional regulation is not necessary or appropriate" for EOR with CO_2, but "state incentives may be helpful."[102]
Statutes, acts, regulations, rules reviewed	Enrolled SB 1765, effective June 3, 2008 – (creating Oklahoma Geologic Storage of Carbon Dioxide Task Force). Act of May 8, 2009, 2009 OK. Laws 142 (re-creating the Oklahoma Geologic Storage of Carbon Dioxide Task Force). Act of June 1, 2009, 2009 OK. Laws 429 (creating the Oklahoma Carbon Capture and Geologic Sequestration Act).

[102] *Id.* § 3-5-101.

Texas

Liability during operations *–Liability assurance required?* *–Indemnity or caps on liability?*	A person to whom a permit is issued must provide to the Texas Railroad Commission annually evidence of financial responsibility that is satisfactory to the Railroad Commission.[103] The Railroad Commission may require a permittee to maintain a performance bond or other form of financial security to ensure that funds are available for plugging, post-injection site care, and closure of an anthropogenic CO_2 injection well. The Railroad Commission is authorized to receive funds as the beneficiary of a financial responsibility mechanism established for the proper management of an anthropogenic CO_2 injection well or GS facility.[104] (See also onshore discussion in next row.)
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer*	Onshore: By December 1, 2010, the Texas Commission on Environmental Quality and the Railroad Commission of Texas, in consultation with the Bureau of Economic Geology of UT-Austin, must prepare a joint report for the legislature analyzing and recommending methods of financial assurance and allocation of long-term liability for the post-operational phase of GS projects.[105] Offshore: Title to the CO_2 is transferred to the School Land Board, and becomes the property of the permanent school fund, on a determination by the School Land Board that permanent storage has been verified and that the storage location has met all applicable state and federal requirements. At this time, the producer of the CO_2 is relieved of liability for any act or omission regarding the CO_2 in the offshore repository. The transfer of title does not relieve a producer of CO_2 for any act or omission regarding the generation of stored CO_2 performed before the CO_2 was stored. A person who contracts with the School Land Board to construct or operate an offshore repository is not relieved of liability for any act or omission regarding the construction or operation of the CO_2 repository.[106]
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum balances?*	Anthropogenic Carbon Dioxide Storage Trust Fund (the "Trust Fund"): Fees paid in. The Railroad Commission may impose fees to cover the cost of permitting, monitoring and inspecting CO_2 wells and GS facilities, and for enforcing and implementing the statute and rules adopted by the Railroad Commission under the statute. These fees will be deposited into the Trust Fund.[107] Penalties imposed for violations of the GS statutes or rules will also be deposited into the Trust Fund.[108] Authorized uses. The Trust Fund may be used by the Railroad Commission only for: • Inspecting, monitoring, investigating, recording, and reporting on GS

[103] TEX. WATER CODE § 27.050 (2009).

[104] *Id.* § 27.073.

[105] S.B. 1387, Leg. Sess. 81(R) (Tex. 2009) § 10(c)(5)(B).

[106] TEX. HEALTH & SAFETY CODE § 382.508 (2009).

[107] TEX. NAT. RES. CODE § 120.003(c) (2009); TEX. WATER CODE § 27.045.

[108] TEX. NAT. RES. CODE § 120.003(c).

	facilities and associated anthropogenic CO_2 injection wells; • Long-term monitoring of GS facilities and associated anthropogenic CO_2 injection wells; • Remediation of mechanical problems associated with GS facilities and associated anthropogenic CO_2 injection wells; • Repairing mechanical leaks at GS facilities; • Plugging abandoned anthropogenic CO_2 injection wells used for GS; • Training and technology transfer related to anthropogenic CO_2 injection and GS; and • Compliance and enforcement activities related to GS and associated anthropogenic CO_2 injection wells.[109]
Exception for negligence, etc.	Not specifically addressed.
Long-term monitoring	Offshore: The General Land Office by rule may establish standards for MMV.[110] Onshore: The Texas Railroad Commission will adopt rules for monitoring, postinjection site care, site closure and long-term stewardship, among other rules.[111] For the potential "clean energy projects" that are eligible for a franchise tax credit of up to $100 million and exemption from taxes on tangible personal property (up to three projects may be designated as "clean energy projects"), the project must contract with the state's Bureau of Economic Geology regarding the entity's MMV plans. The Bureau will design the initial protocols and standards and review and evaluate the MMV process. Unless otherwise agreed by the project and the bureau, the project must pay an annual fee to the Bureau as follows: Year 1: $700,000 Year 2: $1,300,000 Year 3: $1,800,000 Year 4: $1,500,000 Year 5: $1,200,000 Year 6: $900,000 Year 7: $500,000 Year 8: $200,000[112]
CO_2 ownership	Onshore: Unless otherwise expressly provided by a contract, bill of sale, deed, or other legally binding document or by other law, anthropogenic CO_2 stored in a GS

[109] *Id.* § 120.003(d).

[110] TEX. HEALTH & SAFETY CODE § 382.506.

[111] TEX. WATER CODE § 27.047.

[112] TEX. NAT. RES. CODE § 120.003.

	facility is considered to be the property of the storage operator or the storage operator's heirs, successors, or assigns. Absent a final judgment of willful abandonment rendered by a court or a regulatory determination of closure or abandonment, anthropogenic CO_2 stored in a GS facility is not considered to be the property of the surface or mineral estate owner.[113] Offshore: School Land Board ("Board") will acquire title to stored CO_2 on a determination by the Board that permanent storage has been verified and that the storage location has met all applicable state and federal requirement for closure of CO_2 storage sites. The right, title, and interest in CO_2 acquired under this section are the property of the permanent school fund and will be administered and controlled by the Board.[114]
EOR	Injection of fluid for the primary purpose of EOR is regulated separately.[115] The storage of CO_2 incidental to or as part of enhanced recovery operations does not in itself automatically render a facility a geologic storage facility.[116] Rules regarding ownership of CO_2 do not apply to CO_2 injected for the primary purpose of EOR.[117]
Statutes, acts, regulations, rules reviewed	S.B. 1387, Leg. Sess. 81(R) (Tex. 2009) § 10(c)(5)(B) ("relating to the implementation of projects involving the capture, injection, sequestration, or geologic storage of carbon dioxide). H.B. 1796, Leg. Sess. 81(R) (Tex. 2009) (encouraging the development of onshore and offshore geologic storage of CO_2). H.B. 469, Leg. Sess. 81(R) (Tex. 2009) (providing tax credits and other incentives for capture and sequestration projects). H.B. 149, Leg. Sess. 79(3) (Tex. 2006) (providing for state ownership of CO_2 for FutureGen).

[113] *Id.* § 120.002(b)-(c).

[114] TEX. HEALTH & SAFETY CODE § 382.507.

[115] TEX. WATER CODE § 27.042.

[116] *Id.* § 27.002(23).

[117] TEX. NAT. RES. CODE § 120.002.

Washington

Liability during operations *–Liability assurance required?* *–Indemnity or caps on liability?*	Financial assurance mechanisms. Permit applicant must have financial assurance mechanisms sufficient to: • cover the cost to the state for the abandonment of the project or remediation of facility leaks should the operator not perform as required or cease to exist;[118] • cover the plugging and abandonment or the remediation of a CO_2 injection and/or subsurface observation well should the operator not perform as required or cease to exist.[119] Automatic closure provision. If *all* of the project's CO_2 injections are interrupted for a period of 180 consecutive days, the operator must being implementing the approved closure plan. If the operator fails to begin closure, the department will use the financial assurance account to begin closure activities.[120]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	Post-closure: There does not appear to be a transfer of liability to the state. The operator will continue all required monitoring and reporting throughout the closure and post-closure period. The post-closure period will continue until the department determines that modeling and monitoring demonstrate that conditions in the geologic containment system indicate there is little or no risk of future environmental impacts and there is high confidence in the effectiveness of the containment system and related trapping mechanisms.[121]
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum balances?*	There does not appear to be a state fund. The owner or operator must establish a closure and post-closure account to cover all closure and post-closure expenses. The performance security may be: bank letters of credit, cash deposits, negotiable securities, an assignment of a savings account, a savings certificate in a Washington bank, a corporate surety bond executed in favor of the department by a corporation authorized to do business in the state of Washington, or other financial instruments or performance security acceptable to the department. The account is based on the current cost of hiring a third party to close all existing facilities and to provide post-closure care, including monitoring. The closure and post-closure cost estimate will be revised annually. The obligation to maintain the account for closure and post-closure care survives the termination of any permits and the cessation of injection.[122]
Exception for negligence, etc.	Not addressed.
Long-term	*See* "Post-closure," above. The operator appears to be responsible for long-term

[118] WASH. ADMIN. CODE § 173-218-115(2)(p) (2010).

[119] *Id.* § 173-218-115(2)(q).

[120] *Id.* § 173-218-115(5).

[121] *Id.* § 173-218-115(6).

[122] *Id.* § 173-218-115(7).

monitoring	monitoring.
CO_2 ownership	Not addressed.
EOR	Not addressed.
Statutes, acts, regulations, rules reviewed	SB 6001, 2007 Reg. Sess. (Wash. 2007) (mitigating the impacts of climate change). WASH. ADMIN. CODE § 173-407-100 et seq. (2010) (providing for sequestration definitions and rules). WASH. ADMIN. CODE § 173-218-115 (2010) (specifying requirements for Class V wells used to inject CO_2 for geologic sequestration).

West Virginia

Liability during operations *–Liability assurance required?* *–Indemnity or caps on liability?*	In general – rule promulgation. The state's Secretary of the Department of Environmental Protection will promulgate rules regarding, among other things, (1) the necessary financial assurance procedures and (2) the proper duration of the post-closure care period for sequestration sites.[123] A sequestration permit application must include (x) proof of financial assurance to ensure that sequestration sites and facilities will be constructed, operated and closed in accordance with the statute and rules, and (y) a detailed plan for post-closure monitoring, verification, accounting, maintenance and mitigation.[124]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	Not specifically addressed, but see above for some discussion of post-closure monitoring.
State trust fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum balances?*	No state trust fund established.
Exception for negligence, etc.	Not addressed.
Long-term monitoring	Not specifically addressed, but see "Liability during operations" above for some discussion of post-closure monitoring.
CO_2 ownership	Not specifically addressed
EOR	EOR is regulated separately.[125]
Other	Working group. The state's Secretary of the Department of Environmental Protection, in cooperation with the state geologist, will appoint at least 15 people to serve of the carbon dioxide sequestration working group: • At least 3 experts in CCS or related technologies; • At least 1 expert in environmental science;

[123] W. VA. CODE § 22-11A-4(a) (2009).

[124] *Id.* § 22-11A-5(a)(10)-(11).

[125] *Id.* § 22-11A-3; s*ee also id.* § 22-11A-8.

	• At least 1 expert in geology; • At least 1 attorney with expertise in environmental law; • At least 1 expert in engineering; • At least 1 expert in the regulation of public utilities in West Virginia; • 1 representative of a citizen's group advocating environmental protection; • Representative of a coal power electric generating utility advocating CCS development; • At least 1 engineer with expertise in the underground storage of natural gas; • Chair of the National Council of Coal Lessors or his/her designee; • Representative of the West Virginia Coal Association; • Representative of the West Virginia Land and Mineral Owners Association, and • At least 1 representative advocating the interests of surface owners of real property.[126] The working group will develop a long-term strategy for the regulation of CO_2 sequestration in West Virginia.[127]
Statutes, acts, regulations, rules reviewed	HB 2860, 2009 Reg. Sess. (W. Va. 2009) (regulating the sequestration of CO_2).

[126] *Id.* § 22-11A-6(b)-(c).

[127] *Id.* § 22-11A-6(e).

Wyoming

Liability during operations *–Liability assurance required?* *–Indemnity or caps on liability?*	Liability. Injector owns the injected CO_2 and all liabilities of such ownership belong to the injector.[128] Financial assurance: • Permit application must include proof of financial assurance to ensure that geologic sequestration sites and facilities will be constructed, operated and closed in accordance with the act and the rules and regulations promulgated pursuant to the act.[129] • Application must include certificate by an insurance company that the applicant has a public liability insurance policy in force, or evidence that the applicant has satisfied other state or federal self-insurance requirements. The policy must provide for personal injury and property damage protection in an amount and for a duration as established by regulation.[130] • State's department of environmental quality (water quality division) will recommend rules and regulations for (among others): – procedures to establish the type and amount of the bond or financial assurance instrument; – annual or other periodic reporting by the permitee to allow the state to confirm or adjust the amount or type of the bond or other financial assurance requirements consistent with the site-, facility-, and operation-specific risks and conditions; – procedures to require proof of compliance from any permitee ordered by the state to adjust a bond or other financial assurance, including procedures for permit suspension or termination if adequate bonding or financial assurance cannot be demonstrated; and – procedures for the state to forfeit the bond or to make a claim against any insurance instrument providing financial assurance.[131]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	No state assumption of liability. Existence of the Wyoming geologic sequestration special revenue account (see below) does not constitute an assumption of any liability by the state for geologic sequestration sites or the CO_2 and associated constituents injected into those sites.[132] Release of bonds 10 years post-closure. The state's department of environmental quality (water quality division) will recommend rules and regulations for the release of bonds of the termination of insurance instruments: • not less than 10 years after the date when all wells (except monitoring wells)

[128] WYO. STAT. ANN. § 34-1-153 (2010).

[129] *Id.* § 35-11-313(f)(ii)(K).

[130] *Id.* § 35-11-313(f)(ii)(O).

[131] *Id.* § 35-11-313(f)(vi).

[132] *Id.* § 35-11-318(d).

	have been plugged and abandoned, all subsurface operations and activities have ceased, and all surface equipment and improvements have been removed or appropriately abandoned, or • so long thereafter as necessary to obtain a completion and release certificate from the administrator certifying that plume stabilization (as defined by rule) has been achieved without the use of control equipment based on a minimum of 3 consecutive years of monitoring data, and that the operator has completed site reclamation and all required monitoring and remediation sufficient to show that the CO_2 injected into the site will not harm or present a risk to human health, safety or the environment, including drinking water supplies.[133]
Post-closure fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum balances?*	Wyoming geologic sequestration special revenue account.[134] Fees paid in. All monies collected to measure, monitor and verify Wyoming geologic sequestration sites following site closure certification, release of all financial assurance instruments, and termination of the permit.[135] The state's department of environmental quality (administrator of the water quality division) will recommend rules and regulations for fees to be paid by all permitees, which may include a per-ton injection fee or a closure fee.[136] Authorized uses. Funds in the account may be used only for MMV of geologic sequestration sites following site closure certification, release of all financial assurance instruments and termination of the permit.[137]
Exception for negligence, etc.	
Long-term monitoring	Permit application must include detailed plan for post-closure monitoring, verification, maintenance and mitigation.[138]
CO_2 ownership	All CO_2, and other substances injected incidental to the injection of CO_2, injected into any geologic sequestration site for the purpose of geologic sequestration are presumed to be owned by the injector of such material and all rights, benefits, burdens and liabilities of such ownership belong to the injector. No pore space owner of other surface or subsurface interest holder will be liable for the effects of injecting CO_2 (or other incidental substances) for GS purposes solely by virtue of their interest or by their having given consent to the injection.[139]

[133] *Id.* § 35-11-313(f)(vi)(F).

[134] *Id.* § 35-11-318(a).

[135] *Id.* § 35-11-318(b).

[136] *Id.* § 35-11-313(f)(vii).

[137] *Id.* § 35-11-318(c).

[138] *Id.* § 35-11-313(f)(ii)(M).

[139] *Id.* § 34-1-153.

EOR	EOR is regulated separately. EOR site can be converted to geologic sequestration upon the cessation of oil and gas recovery operations.[140]
Statutes, acts, regulations, rules reviewed	HB 17, 60th Leg., 2010 Budget Sess. (Wyo. 2010) (regarding carbon sequestration financial assurances and regulation). HB 57, 60th Leg., 2009 General Sess. (Wyo. 2009) (declaring the mineral estate dominant over pore space). HB 58, 60th Leg., 2009 General Sess. (Wyo. 2009) (providing for ownership of CO_2). HB 80, 60th Leg., 2009 General Sess. (Wyo. 2009) (providing for the unitization of carbon sequestration sites). HB 89, 59th Leg., 2008 Budget Sess. (Wyo. 2008) (specifying ownership of pore space). HB 90, 59th Leg., 2008 Budget Sess. (Wyo. 2008) (providing for regulation of CO_2 injection).

[140] *Id.* § 35-11-313(b)-(c).

IOGCC Model[141]

Liability during operations *–Liability assurance required?* *–Indemnity or caps on liability?*	Liability during "closure period." Closure is divided into a Closure Period and Post-Closure Period. Closure Period is the period of time beginning when the plugging of injection wells is completed and continuing for a predetermined number of years (10, 29, etc.). During the Closure Period, the operator would be the responsible party and be required to maintain the operational bond and individual or blanket well bonds. The individual well bonds will be released as the wells are plugged. At the end of the Closure Period, the operational bond would be released and the liability for ensuring the site remains secure would transfer to the state. Performance bonds. Application for a permit must include a performance bond covering the surface facility. The amount of the bond must be sufficient to provide financial assurance to the state regulatory agency to cover the abandonment of the project or remediation of facility leaks should the operator not perform as required or cease to exist. The application must also include a performance bond for each injection and subsurface observation well. The amount must be sufficient to provide financial assurance to the state regulatory agency to cover the plugging and abandonment or the remediation of a CO_2 injection and/or subsurface observation well should the operator not perform as required or cease to exist. Upon the issuance of the certificate of completion of injection operations, any performance bonds posted by the operator will be released.
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	Transfer of liability. Upon the issuance of the certificate of completion of injection operations, the operator and all generators of any injected CO_2 shall be released from all further state regulatory agency liability associated with the project, except that, if no trust fund is established to clearly address future liability, the operator would be required to retain long-term liability, similar to hazwaste law requirements. Post-closure certification. 10 years, or other time frame established by rule, after cessation of storage operations, the state regulatory agency will issue a certificate of completion of injection operations, upon a showing by the storage operator that the reservoir is reasonably expected to retain mechanical integrity and remain emplaced, at which time ownership to the remaining project including the stored CO_2 transfers to the state.
Post-closure fund *–Fees paid in?* *–Authorized uses?* *–Minimum,*	State-administered trust fund. Fees paid in. The trust fund will be capitalized by a tax or fee paid by the CO_2 storage project operator on a per-ton-of-injected-CO_2 basis. Tax or fee would be deposited in the trust fund and would be sufficient to cover the costs related to long-term MMV and capture of CO_2 should any CO_2 escape

[141] This section summarizes the following document: Interstate Oil and Gas Compact Commission, *Storage of Carbon Dioxide in Geologic Structures: A Legal and Regulatory Guide for States and Provinces* (2007).

maximum balances?	from the storage reservoir. Authorized uses. Trust fund would be used solely for long-term monitoring, remediation of mechanical problems associated with remaining wells and surface infrastructure, repairing mechanical leaks at the site, and plugging and abandoning remaining wells under the state's jurisdiction for use as observation wells. Other fees. Storage operator would also pay a per-ton tax or fee to the state regulatory agency for the purpose of funding the administration and enforcement of the laws relating to geologic storage of CO_2 during the operational phase.
Exception for negligence, etc.	Not addressed.
Long-term monitoring	Upon the issuance of the certificate of completion of injection operations, continued monitoring of the site, including remediation of any well leakage, will become the responsibility of the state trust fund.
CO_2 ownership	Not addressed.
EOR	The proposed rules and regulations are not intended to apply to EOR projects during their normal working life, except to the extent an EOR project operator may propose to also permit the EOR project as a CO_2 storage project simultaneously.

Other liability models reviewed by the IOGCC Task Force:

- Texas FutureGen model: legislative assumption of liability by the state with no funding mechanism
- Governmental insurance fund, like the federal flood insurance program
- Private insurance program funded through premiums
- Price-Anderson Act model, which would protect the liability of the site operator and the CO_2 generators
- Federal Superfund model under CERCLA
- Federal Oil Pollution Act of 1990
- Acquisition by the state of the storage rights through private purchase of the storage rights from private owners
- RCRA model – generators of the CO_2 would be the responsible party

Task Force concluded that using existing frameworks developed by the states for addressing abandoned and orphaned oil and gas wells is best model. Task Force therefore proposes the creation of an industry-funded and state-administered trust fund.

European Union

Liability during operations *–Liability assurance obligations?* *–Indemnity or caps on liability?*	Financial security required. Member States shall ensure that adequate financial security "or any other equivalent" will be valid and effective before commencement of injection. The financial security will be periodically adjusted to take account of changes to the assessed risk of leakage and the estimated costs of all obligations arising under the permit. The financial security will remain valid until the responsibility for the site is transferred to the competent authority.[142] The operator must submit to the operator, at least annually, proof of the putting in place and maintenance of the financial security.[143]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	Transfer after 20 years. Transfer to the "competent authority" may occur no sooner than 20 years after injections end, if "all available evidence indicates that the stored CO_2 will be completely and permanently contained" and the operator has made a financial contribution to cover at least the anticipated cost of monitoring for a period of 30 years.[144]
Post-closure fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum amounts?*	No specific fund created, but the operator must make a financial contribution to cover at least the anticipated cost of monitoring for a period of 30 years before transfer of the site to the competent authority may occur.[145]
Exception for negligence, etc.	In cases where there has been fault on the part of the operator, including cases of deficient data, concealment of relevant information, negligence, willful deceit or a failure to exercise due diligence, the competent authority will recover from the operator the costs incurred after the transfer of responsibility has taken place.[146]
Long-term monitoring	Legal obligations relating to monitoring will transfer to the competent authority no sooner than 20 years after injections end, as described above.[147]

[142] Council Directive 2009/31/EC, 2009 O.J. (L 140) art. 19.

[143] *Id.* art. 14.

[144] *Id.* art. 18.

[145] *Id.*

[146] *Id.* art. 18(7).

[147] *Id.* art. 18.

CO_2 ownership	n/a
EOR	n/a
Offshore	The European Directive on CCS applies to both onshore and offshore geological storage.[148]
Consequences if operator does not fulfill its obligations	The competent authority will review and update or, as a last resort, withdraw the storage permit (a) if it has been notified or made aware of any leakages or significant irregularities, (b) if annual reports and annual environment inspections show non-compliance with permit conditions or risks of leakages or significant irregularities; (c) if it is aware of any other failure by the operator to meet the permit conditions, (d) if it appears necessary on the basis of the latest scientific findings and technological progress; or (e) without prejudice to points (a) to (d), five years after issuing the permit and every 10 years thereafter. If a permit is withdrawn, the competent authority will either issue a new permit or close the site. Until a new storage permit is issued, the competent authority will temporarily take over all legal obligations relating to acceptance criteria where the competent authority decides to continue CO_2 injections, monitoring and corrective measures, the surrender of allowances in cases of leakage, and preventive and remedial action. The competent authority will recover any costs incurred from the former operator.[149] If the competent authority decides to withdraw a storage permit, the storage site will be closed, and the competent authority will be responsible for monitoring and corrective measures pursuant to the Directive on CCS, for obligations relating to the surrender of allowances in case of leakages pursuant to Directive 2003/87/EC (GHG emission allowance trading), and for preventive and remedial action pursuant to Articles 5(1) and 6(1) of Directive 2004/35/EC (environmental liability with regard to the prevention and remedying of environmental damage).[150] The financial security must remain valid and effective until responsibility is transferred to the competent authority "if and when all available evidence indicates that the stored CO_2 will be completely and permanently contained, and after the site has been sealed and the injection facilities have been removed."[151]
Statutes, acts, regulations, rules reviewed	Council Directive 2009/31/EC, 2009 O.J. (L 140) (on the geological storage of carbon dioxide). Council Directive 2004/35/CE, 2004 O.J. (L 143) (on environmental liability with regard to the prevention and remedying of environmental damage).

[148] *Id.* art. 2.

[149] *Id.* art. 11.

[150] *Id. a*rt. 17.

[151] *Id.* art. 19(3)(b)(ii).

Commonwealth of Australia[152]

Liability during operations *–Liability assurance obligations?* *–Indemnity or caps on liability?*	O/O is liable during operations. An assessment permit or injection license may include a condition that the registered holder maintain insurance against expenses, liabilities, or specified things arising in connection with, or as a result of, carrying out work under the permit, lease, license or authority, including insurance against expenses of complying with directions regarding the clean-up or other remediation of the effects of an escape of CO_2.[153]
Transfer of liability (if any) *–Post-closure certification process* *–Caps on liability after transfer?*	O/O applies for a site closing certificate. The responsible Commonwealth Minister will have five years to make a decision on the application.[154] The responsible Commonwealth Minister first issues a pre-certificate notice. S/he may refuse to issue such notice if (a) s/he is not satisfied that the injected CO2 is behaving as predicted in the site plan, or (b) s/he believes there is a significant risk that the sequestered CO2 will have a significant adverse impact on the conservation or exploitation of natural resources, the geotechnical integrity of the whole or a part of a geological formation or geological structure, the environment, or human health and safety.[155] The pre-certificate notice will specify a monitoring program to be carried out by the Commonwealth, including an estimate of the total costs of carrying out the program, and the specific form and amount of a security to be lodged by the applicant to cover these costs. The responsible Commonwealth Minister will then issue the site closing certificate when the applicant lodges the specified security.[156] Starting 15 years after the site closing certificate is issued, the Commonwealth will indemnify the license holder for damages, provided that certain conditions were met during the 15-year period between the issuance of the site closing certificate, such as that the sequestered CO2 is behaving as predicted and there is no significant risk that the CO2 will have a significant adverse impact on the environment or on human health and safety. If at the point 15 years after the site closing certificate, the license holder has ceased to exist, the Commonwealth will assume liability.[157]

[152] The states of Victoria and Queensland have also enacted liability frameworks for sequestration; *see* Victoria's *Greenhouse Gas Geological Sequestration Act 2008*, No. 61 of 2008, available at http://www.legislation.vic.gov.au/Domino/Web_Notes/LDMS/PubStatbook.nsf/51dea49770555ea6ca256da4001b90cd/7E4801FE0E8E3A55CA2574F80019A141/$FILE/08-61a.pdf; and Queensland's *Greenhouse Gas Storage Act 2009*, Act No. 3 of 2009, available at http://www.legislation.qld.gov.au/LEGISLTN/ACTS/2009/09AC003.pdf. Western Australia enacted legislation establishing permitting procedures for CO_2 storage at Barrow Island's Gorgon project.

[153] Offshore Petroleum Amendment (Greenhouse Gas Storage) Act 2008, No. 117, 2008, § 302(2).

[154] *Id.* §§ 249CZE(1), 249CZF(8).

[155] *Id.* § 249CZF.

[156] *Id.* §§ 249CZGAA, 249CZGA.

[157] *Id.* §§ 249CZO, 249CZN, 249CZP.

	In addition, also starting 15 years after the site closing certificate is issued, the Commonwealth will assume liability for the site
Post-closure fund *–Fees paid in?* *–Authorized uses?* *–Minimum, maximum amounts?*	There does not appear to be a fund.
Exception for negligence, etc.	Not addressed.
Long-term monitoring	As noted above, after the responsible Commonwealth Minister issues a site closing certificate, the Commonwealth is responsible for carrying out monitoring, the cost of which is paid by the license holder.[158] The Commonwealth can recover costs and expenses of long-term monitoring from the holder of the site closing certificate, but only up to the amount of costs and expenses that the Commonwealth estimated in the pre-certificate notice.[159]
CO_2 ownership	The Commonwealth owns the injected CO2.
EOR	Not addressed.
Offshore	Commonwealth of Australia legislation pertains to offshore sequestration only.
Statutes, acts, regulations, rules reviewed	Offshore Petroleum Amendment (Greenhouse Gas Storage) Act 2008, No. 117, 2008.

[158] *Id.* §§ 249CZGAA, 249CZGA.

[159] *Id.* § 249CZM.