Columbia Law School | COLUMBIA CLIMATE SCHOOL
SABIN CENTER FOR CLIMATE CHANGE LAW

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California Air Resources Board
1001 I Street
Sacramento, CA 95814

VIA ELECTRONIC SUBMISSION

Re: Concepts for Potential Regulations for Establishing the Carbon Capture, Removals, Utilization, and Storage Program Under Senate Bill 905

Columbia Law School's Sabin Center for Climate Change Law ("Sabin Center") respectfully submits these comments in response to the California Air Resource Board's ("CARB") request for feedback on the draft document titled "Concepts for Potential Regulations for Establishing the Carbon Capture, Removals, Utilization, and Storage Program" in furtherance of Senate Bill ("SB") 905 (Caballero, Statutes of 2022).[1]

An academic think tank housed at Columbia Law School, the Sabin Center works to develop innovative legal tools to combat the climate crisis and advance climate justice. Through its initiative on "carbon management and greenhouse gas removal," the Sabin Center analyzes legal issues associated with point-source carbon capture, utilization, and storage ("CCUS") and atmospheric carbon dioxide removal ("CDR"), both domestically in the U.S. and internationally.[2] Much of our recent work has focused specifically on the role that U.S. states—including

[1] Cal. S.B. 905 (2021–2022 Sess.), ch. 359 (Cal. 2022).
[2] For more on the Sabin Center's recent work on CCUS and CDR, *see* https://climate.law.columbia.edu/content/carbon-management-and-greenhouse-gas-removal.

California—can and should play in regulating CCUS and CDR activities.[3] Drawing on the lessons from that work, below, we offer responses to several of the questions posed by CARB in its draft "Concepts for Potential Regulations for Establishing the Carbon Capture, Removals, Utilization, and Storage Program." We previously submitted comments[4] on October 6, 2025, in response to CARB's request for information to inform implementation of SB 905, which are also relevant here. We encourage CARB to consider those previous comments, alongside the points made below, in developing its rulemaking proposal.

Comments on Section 95701: Definitions

Several of the definitions in section 95701 require further clarification and refinement. At the outset, we note some of the definitions were established by the State legislature in SB 905, and thus cannot be changed by CARB via the rulemaking process. CARB can, however, add much needed clarity to the statutory definitions. Most notably, additional clarification is needed regarding what qualifies as a "carbon dioxide removal technology," which SB 905 defines as "carbon capture, utilization, and storage technology or equipment used for capturing and sequestering carbon dioxide emissions from industrial, commercial, or energy related facilities or sources." This definition could be read as only encompassing activities that capture carbon dioxide at emissions sources (i.e., what is generally referred to in the carbon management sector as "point source carbon capture and storage") and not CDR activities that remove carbon dioxide from the atmosphere. It is, however, clear from other parts of SB 905 that the legislature did not intend to cover only point-source capture. Consistent with legislative intent, CARB should clarify that CDR

[3] *See e.g.*, ASHWIN MURTHY ET AL., REGULATION OF COASTAL ENHANCED WEATHERING IN MASSACHUSETTS (2025), https://scholarship.law.columbia.edu/sabin_climate_change/270/; ASHWIN MURTHY ET AL., THE LEGAL FRAMEWORK FOR ENHANCED ROCK WEATHERING IN MINNESOTA (2025), https://scholarship.law.columbia.edu/sabin_climate_change/263/; ASHWIN MURTHY ET AL., REGULATION OF SARGASSUM REMOVAL AND SINKING IN FLORIDA (2025), https://scholarship.law.columbia.edu/sabin_climate_change/247/; ASHWIN MURTHY ET AL., SEAWEED CULTIVATION AND SINKING FOR CARBON DIOXIDE REMOVAL IN ALASKA (2025), https://scholarship.law.columbia.edu/sabin_climate_change/246/; ASHWIN MURTHY ET AL., REGULATION OF OCEAN ALKALINITY ENHANCEMENT IN WASHINGTON STATE (2025), https://scholarship.law.columbia.edu/sabin_climate_change/242/; ASHWIN MURTHY ET AL., STATE AUTHORITY TO REGULATE OCEAN ALKALINITY ENHANCEMENT (2024), https://scholarship.law.columbia.edu/sabin_climate_change/237/; KOREY SILVERMAN-ROATI ET AL., PERMITTING SEAWEED CULTIVATION FOR CARBON SEQUESTRATION IN CALIFORNIA: BARRIERS AND RECOMMENDATIONS (2022), http://scholarship.law.columbia.edu/faculty_scholarship/3523.

[4] *See* https://climate.law.columbia.edu/sites/climate.law.columbia.edu/files/content/Sabin%20Center%20Comment%20Letter%20on%20SB%20905.pdf

is also included. It appears that CARB has attempted to do just that through the definition of "carbon dioxide capture," which it describes as "the process of concentrating carbon dioxide present in flue and/or exhaust gases, ***or air***, via chemical and/or physical separation methods" (emphasis added). This definition is, however, overly narrow and would exclude a number of CDR approaches that do not separate carbon dioxide from air. For example, many marine CDR approaches remove carbon dioxide from ocean waters, and thereby enable additional carbon dioxide uptake by the ocean from the atmosphere. Those activities would fall outside CARB's definition of "carbon capture" and thus the statutory definition of "carbon dioxide removal technology." So too would terrestrial approaches that do not use chemical and/or physical separation methods to concentrate carbon dioxide in air (e.g., enhanced weathering approaches).

Several other definitions proposed by CARB also require further refinement. Specifically:

- The definition of "carbon capture and storage" refers to activities involving "the separation … of carbon dioxide," but does not specify the source material from which the carbon dioxide is separated. The same issue arises in the definition of "carbon capture and utilization," which refers to "the use of captured carbon dioxide" but does not specify where the carbon dioxide is captured. This could create confusion as to the projects that are covered by the definitions. To address this issue, we recommend that CARB clarify that carbon dioxide may be captured from emissions sources or the air, either directly or indirectly. Clarifying that carbon dioxide may be captured from air indirectly is important to encompass activities like certain forms of marine CDR, which do not strip carbon dioxide directly out of the air, but rather remove it from ocean waters and thereby enable the ocean to drawdown more carbon dioxide from the atmosphere.
- The definitions of "carbon capture and storage" and "carbon dioxide removal" should state, expressly, that carbon dioxide must remain out of the atmosphere for 100 years or more. This is important to ensure that CCS and CDR projects deliver true climate benefits and align with other actions taken in California and elsewhere. For example, in 2025, the California legislature enacted SB 643 which states that CDR projects must result in "storage of removed gases without leakage to the atmosphere ... [for] not less than 100-years."[5]

[5] Cal. S.B. 643 (2025-2026 Sess.), ch. 8.5 (Cal. 2025).

- The definition of "carbon dioxide stream" is currently limited to "carbon dioxide that has been captured from an emissions source." This would exclude carbon dioxide that is removed from the atmosphere even though, as noted above, the State legislature clearly intended the program established via SB 905 to cover CDR. We note that the definition adopted by CARB is taken from the federal Environmental Protection Agency's (EPA's) Underground Injection Control (UIC) program regulations, but CARB is not required to adopt the same limited definition of "carbon dioxide stream" as is used in those regulations. Indeed, other states that have developed regulations for geologic carbon dioxide storage and assumed primacy over Class VI wells covered by the UIC program have defined "carbon dioxide stream" more broadly. One example is Texas, which has adopted regulations defining "carbon dioxide stream" to mean carbon dioxide "that has been captured from an emissions source or the atmosphere, incidental associated substances derived from the source materials and the capture process, and any substances added to the stream to enable or improve the injection process."[6] While an improvement on EPA's definition, Texas' definition may still not encompass all potential CDR pathways (e.g. the marine CDR approach of direct ocean capture, where carbon dioxide is stripped out of ocean waters). CARB should clarify that any carbon dioxide obtained from "carbon dioxide capture" (as defined above) qualifies as a carbon dioxide stream.
- The definition of "marine carbon storage" appears to only encompass marine CDR approaches involving ocean alkalinity enhancement. The definition should be expanded to also cover other marine CDR techniques that do not sequester carbon dioxide in dissolved bicarbonate but nevertheless result in durable (100 year or more) storage of carbon dioxide. Adoption of this broader definition is especially important given the early stage of development of the marine CDR field and the fact that multiple potential approaches (including but not limited to ocean alkalinity enhancement) are still being investigated. It is, therefore, too early to pick a "winner" and the regulations should encompass a broader range of approaches.
- The definition of "synthetic CDR" refers to approaches using engineered systems powered by low carbon energy, but does not specify what qualifies as "low carbon energy." Further,

[6] 16 Texas Admin. Code § 5.102(7)

the definition of "synthetic CDR" may have limited utility. As there is already a definition for "carbon dioxide removal," the addition of the definition of "synthetic CDR" may lead to confusion as to which projects are covered by the regulations.

Comments on Section 95703: General Project Reporting of CCUS and CDR Technologies

We urge CARB to expand section 95703 to impose additional disclosure and consultation requirements on project developers. As currently drafted, section 95703 requires project developers to create a public-facing website, which will house information about their activities. While we agree that this would be a useful endeavor, it is unlikely to be sufficient by itself to achieve CARB's stated goal of "facilitat[ing] public access to permit and project information."

Even if section 95703 is fully complied with, members of the public may face various challenges in accessing project-related information. For example, members of the public may be unaware that a project has been proposed and may not know to visit the project website for information or, even if they do know this, may lack reliable internet access and thus be limited in their ability to view the website. Issues with understanding the information published by the developer may also arise. Moreover, CARB's proposed approach does not incorporate any opportunities for members of the public to ask questions or raise concerns with project developers—it provides solely for a one-way flow of communication from the developer to the public, but robust engagement requires a two-way dialogue. While there may be some opportunities for public feedback on a project as part of the formal permitting process, that may happen too late and be too limited in scope to make a meaningful difference to the design or execution of the project.

For the above reasons, we encourage CARB to consider additional measures to improve public awareness of, and participation in, CCUS and CDR projections. At a minimum, CARB should require project developers to publicize projects through multiple channels (e.g., via local newspapers, neighborhood flyers, and community events), and provide opportunities for the community to provide feedback on projects (e.g., via town halls or other events).

Comments on Section 95704.6: Financial Responsibility for Geologic Storage Projects

We encourage CARB to revise section 95704.6 to include restrictions on transfers of carbon storage operations. CARB has stated that section 95704.6 is intended "to establish long-term financial responsibility requirements for geologic storage operators." We agree with CARB that

geologic storage operators should be required to demonstrate financial responsibility using trust funds, surety bonds, or other financial instruments. CARB's proposed regulations with respect to coverage scope, maintenance period, and conditions are appropriate and should help to reduce the risk that the State will end up having to bear the costs of injection well plugging and other decommission and remedial work. However, to further reduce that risk, we recommend that the regulations also include provisions restricting the transfer of carbon storage operations, unless and until the new operator provides a replacement financial assurance.

The history of operations in the oil and gas industry demonstrates why transfer restrictions are so important. Absent restrictions, oil and gas wells are often transferred multiple times throughout their useful lives to new operators, who may lack the financial resources needed for decommissioning, and thus the State is forced to bear that cost.[7] Recognizing this issue, during the Biden Administration, the Department of the Interior proposed a "Fitness to Operate" standard which was "intended to weed out [oil and gas] companies unable to cover cleanup costs or guilty of safety and environmental infractions."[8] While the standard was never finalized, it aimed to establish "safety, environmental, and financial responsibilities" that oil and gas companies would have to meet in order to operate in the U.S. Outer Continental Shelf.[9]

CARB should incorporate similar transfer restrictions into section 95704.6 of the regulations. Specifically, the regulations should establish minimum standards for incoming operators, requiring them to demonstrate financial, safety, and environmental competency sufficient to manage operational cleanup, and prevent safety and environmental infractions. The standards could be flexible, reflecting the early stage of development of the carbon storage industry, and could include tailored requirements with respect to corporate structuring, revenue projections, history of environmental compliance, and emergency management protocols. The regulations could also include some form of trailing liability, such that if carbon storage operations change hands, the

[7] *See* MARTIN LOCKMAN ET AL., DECOMMISSIONING LIABILITY AT THE END OF OFFSHORE OIL AND GAS: A REVIEW OF INTERNATIONAL OBLIGATIONS, NATIONAL LAWS, AND CONTRACTUAL APPROACHES IN TEN JURISDICTIONS (2023), https://scholarship.law.columbia.edu/sabin_climate_change/205/.
[8] Heather Richards, *Long Delayed Biden Rule Could Shake Up Offshore Well Cleanups*, POLITICO E&E NEWS (Dec. 11, 2023), https://www.eenews.net/articles/long-delayed-biden-rule-could-shake-up-offshore-oil-well-cleanups/. See also DEP'T OF INTERIOR, REPORT ON THE FEDERAL OIL AND GAS LEASING PROGRAM, (2021), https://www.doi.gov/sites/doi.gov/files/report-on-the-federal-oil-and-gas-leasing-program-doi-eo-14008.pdf.
[9] Dep't of Interior, *supra* note 7, at 12.

original operator is liable until their financial assurances are released on provision of a replacement financial assurance.[10]

The regulations should also account for situations in which the financial assurance provided by the carbon storage operator is insufficient and the State is required to bear the cost of decommissioning or remedial action. For example, the regulations could include an explicit provision stating that the regulator can proceed against the operator for cost recovery, in the event that the regulator has to undertake decommissioning or other work.

Comments on Section 95705: Carbon Capture and Storage Unified Permit Application

As we stated in our previous comments on SB 905, the goal of the unified permit application should be to avoid duplicative administrative proceedings and expedite the issuance of permits. One way to further this goal would be for CARB to implement pre-application processes, whereby project proponents have an opportunity to meet with relevant permitting agencies before submitting an application. This pre-application process could be coordinated by CARB, which could facilitate relevant meetings and offer guidance to project applicants about, for example, the information they will be required to submit with their application and the review process permitting agencies will undertake. This would increase the likelihood that project developers submit complete applications on the first try, thereby avoiding delays in the process and easing the burden on permitting agencies (since they would need to devote fewer resources to follow-ups and requests for additional information).

The guidance documents issued by CARB should explain the different permits that may be required for different types of CCUS and CDR activities. CARB might consider creating an online tool to help project proponents determine what permits they need (e.g., similar to CalGold Permit Assistant Tool developed by the California Governor's Office of Business and Economic Development[11] or the Online Permitting Assistant System developed by the Washington State Governor's Office for Regulatory Innovation and Assistance[12]). CARB could also create an online library of permit application forms and an online directory of key individuals at permitting agencies who can answer questions about the application process. Guidance on the information

[10] *See* LOCKMAN ET AL., *supra* note 7.
[11] *See* https://www.calgold.ca.gov/.
[12] *See* https://www.oria.wa.gov/site/alias__oria/4235/OPAS.aspx.

that applicants will need to provide (e.g., a checklist or similar document), the different stages of the application review process, and the expected timeline, would also be useful.

In addition to publishing guidance documents and other resources, CARB could also designate a representative to act as a liaison between the project proponent and staff at permitting agencies. This is likely to be particularly valuable where multiple agencies are involving in reviewing and approving a project since, in those situations, project proponents may find it difficult to know who to speak to about a particular issue and/or to engage with multiple agencies simultaneously. CARB can play an important role in facilitating communication and coordinating work across agencies.

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Thank you for the opportunity to submit these comments. Please do not hesitate to contact the Sabin Center with any questions.

Sincerely,

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