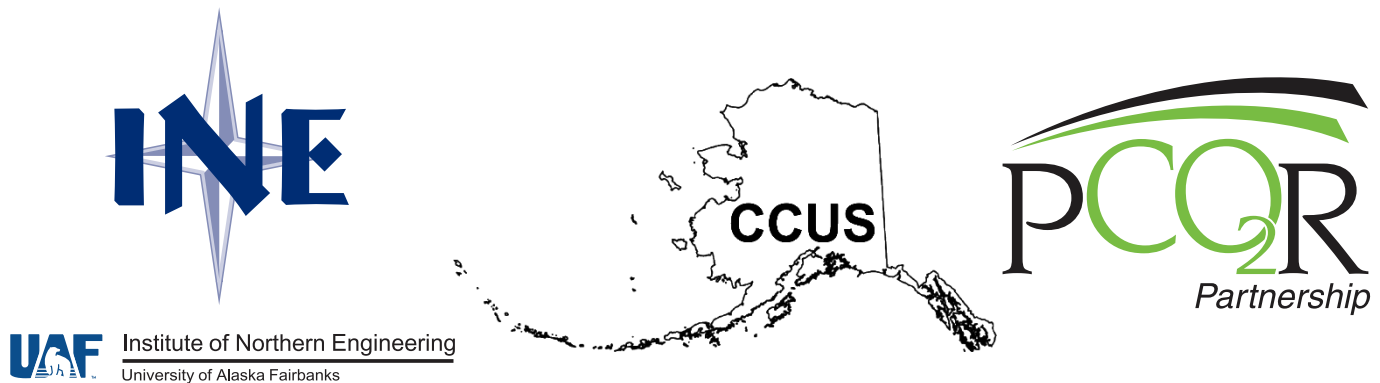


Issue and Policy Review for Carbon Capture, Utilization, and Storage (CCUS) in the State of Alaska

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Prepared by the Division of Oil & Gas, Department of Natural Resources, State of Alaska



Introduction

This paper summarizes five meetings regarding carbon capture, utilization, and storage (CCUS) organized by the University of Alaska with the assistance of the [PCOR partnership](#) and the Alaska Department of Natural Resources (DNR). At these meetings, stakeholders from several State of Alaska agencies, the University of Alaska, the energy and carbon storage industry, and public/non-government organizations came together to discuss a potential CCUS program in the State of Alaska. Many of these stakeholders also collectively contributed to a response to a Request for Information (RFI) from the U.S. Department of Energy (USDOE) highlighting the potential for CCUS in Alaska after passage of the Infrastructure Investment and Jobs Act (IIJA) in 2021. While part of the impetus for investigating legislation and policy options for CCUS is to take advantage of funding available through the USDOE under the IIJA, positioning Alaska to participate in this growing sector is in the long-term interest of the state and could significantly increase investment opportunities, welcome new industry, be an opportunity for existing industry, and create more jobs.

The kickoff meeting in July laid out a plan to review regulatory framework options. A series of background informational meetings were held, and the group convened during a one-day symposium to gather feedback on points of consensus, areas of concern, and lingering questions requiring further investigation. The background informational meetings covered:

1. State property rights and the licensing of State pore space;
2. The amalgamation of property rights and the potential conflicts between existing uses and future CCUS uses;
3. Long-term liability for the CO₂ plume;
4. Fiscal levers available to industry or the state to encourage development; and
5. Class VI underground injection wells.

Participants were provided background briefings on the topics and the groups were then polled on several prompts for each topic. The summary results of these polls are discussed below.

This paper does not represent a final decision by the State of Alaska or any other entity – rather it is informational about the discussions that occurred in these meetings. The ideas generated by these sessions and memorialized in this paper are the result of research and brainstorming exercises, which are still ongoing. More work must be done to review legal implications and ultimately select options for legislation and policy, which will then be subject to the political and legislative process. This paper is organized with a brief introduction to each topic of potential legislative/regulatory concern, a summary of the issues as presented to the small symposium groups, and a summary of the feedback provided by the small symposium groups – to be a resource during these future, formal processes. The conclusion captures the most important points requiring evaluation for legislation and executive policy decisions.

1. State property rights & licensing

Status of State and Private Pore Space Ownership

Codification of pore space rights ownership would be a necessary preliminary step to a CCUS program. Alaska received all mineral rights underlying the land entitlement granted at statehood, and, uniquely among the states, is required to retain those mineral rights for any land it has sold or otherwise disposed. The Alaska Supreme Court held the mineral estate reserved by the State in this compulsory reservation includes the pore space used for storage of injected gases, including CO₂. As a result, the State owns the pore space both beneath entitlement lands that it holds today and beneath entitlement lands it has sold to others, including private individuals—meaning that the state owns an even broader scope of pore space than its currently-owned surface lands.

The full fee estate held by Regional Alaska Native Corporations includes the pore space. Additionally, various other private mineral rights exist in Alaska. It is unclear, especially where granting documents include only some features of the mineral estate, to whom pore space title belongs in these cases. Ultimately, in the significant acreage where the State has the full mineral estate, the matter is clear, presenting an opportunity to maximize the value of the State's natural resources in partnership with prospective CCUS operators.

Possible Leasing/Licensing Regimes

To enable a CCUS industry, the State must be empowered to offer its pore space to potential operators consistent with its constitutional mandates, limitations, and processes imposed by the legislature (akin to those in the Alaska Land Act, for example). In general, sovereigns in the CCUS space offer acreage through three general methods:

Competitive – Blocks of tracts offered to the highest bidder. This would likely occur in much the same format as the regular lease sales held by the Division of Oil & Gas (DOG).

Negotiated – An operator brings a proposal to the sovereign. In this approach, the prospective operator would identify a project area and apply to DOG for a license to carry the project out.

Nomination/Request for Proposal – Operators Nominate blocks and there is an opportunity for competing proposals for those blocks. This adds an element of competition to the negotiated approach. This is how DOG's exploration licensing program for oil and gas, and prospecting permits for geothermal, are presently conducted.

Feedback Summary

Symposium members were asked generally how they might design a leasing/licensing program for the State to offer its pore space, what factors led to their recommendation of this methodology and, finally, what factors the State should consider when evaluating proposals offered by operators to utilize State pore space rights for carbon storage.

Participants generally agreed the CCUS industry is in emerging status, so the land managers should be accorded flexibility within any statutory authority granted in how a leasing or licensing program is rolled out and implemented. Suggestions ranged from adapting the existing Exploration License program for greenfield storage projects to providing area-specific or areawide storage competitive lease sales for brownfield areas or other areas where there is established knowledge of subsurface conditions. There was specific enthusiasm for the State to provide for conversion of existing oil and gas leases to CO₂ storage leases by transitioning current oil and gas fields from production operations/enhanced oil recovery injection operations to pure storage/sequestration operations. It was also suggested to provide some form of carbon capture right of first refusal to existing oil and gas field operators for storage projects proposed at producing oil and gas fields to fairly incentivize an operator who has heavily invested and acquired subsurface knowledge. Such a right could also induce an operator to begin CO₂ storage at the end of a field's economic life. There was broad support by participants for a multi-pronged leasing/licensing approach appropriate for the level of subsurface knowledge, risk, and industry interest with maximum flexibility of the land management agency to evolve a leasing/licensing program as experience advances.

Key considerations in specifying this approach to leasing included: provisions to allow or promote, including appropriate compensation, reusing existing oil and gas infrastructure (*e.g.*, pipelines, platforms, or well pads), addressing DR&R liability transferal, and giving flexibility to the land management agency to design a leasing program to minimize regulatory complexity and avoid or mitigate impacts on existing uses. A long lease term for project build-out and avoiding conflict with existing uses were also highlighted. The end goal was to ultimately make Alaska an attractive environment for industry investment.

The goal of a CCUS leasing or licensing regime is the establishment of *operating* injection facilities and not warehousing of acreage and property rights speculation. To that end, symposium participants wanted to ensure operators and proposed projects be evaluated on several factors and not just awarded to the "highest bidder." Participants believed the State should consider an operator's existing leasehold, experience in the lease area, executing CCUS projects, how the CO₂ source pairs with the sink, whether the project might interfere with another project or lease and clearly establish the dominant subsurface mineral estate function based on economic considerations. Long-term financial surety, contractual agreements between extraction and injection operations to ensure avoidance of conflict, work commitments on projects to ensure they progress, and measures to ensure acreage is not "warehoused" were important factors. Methods to transparently and fairly deconflict the use of existing remote infrastructure such as a formulaic method for compensating the developer/owner of the infrastructure for its use by others (and even competitors) and a unified and simplified leasing and permitting regime, especially for transportation infrastructure (pipelines) was also highlighted as being important.

Symposium members were aware of the pivotal role the State will play in establishing (from a property rights perspective) the CCUS industry, and feedback endorsed flexibility in the program, priority for

extractive processes, and for substantive analysis of projects and project operators (*i.e.*, robust qualifications to be awarded a license) to ensure development proceeds. Finally, further work could be done by the State to address geologic uncertainty, which could include geologic investigations by the State or different leasing regimes for areas of known geology versus those that might be considered frontier basins.

2. Amalgamation of Property Rights & Mineral Interest Conflicts

Amalgamation of Property Rights

Given the potential subsurface extent of an injected CO₂ plume, it is possible a storage project will require several parcels of land, potentially with different ownership or lease terms. For example, there could be a mix of Federal, State, Alaska Native Corporation, and private mineral interests overlying an area proposed for CO₂ injection operations. An operator must have a mechanism to amalgamate those parcels and their commensurate rights and interests. Those familiar with oil and gas will recognize the traditional practice of *unitization*. This highly effective legal tool brings together different oil and gas rights, which may have varied lessees, lessors, and ownership interests, under a unit based on the assumed subsurface picture for simple and fair management and protection of respective interests. This amalgamation often occurs by private agreement among the owners and operators, but in instances where consensus cannot be achieved many states provide for compulsory unitization and, indeed, in the oil and gas context, the Alaska Oil and Gas Conservation Commission currently provides processes to settle unitization disputes under the authority granted in AS 31.05.100 and implemented by 11 AAC 25.055 and 25.520. A similar framework of statutes and regulations will provide a stable, predictable environment for CCUS projects, while protecting the correlative rights of property owners, as it has for Alaskan oil and gas since the 1960s.

Addressing Mineral Interest Conflicts

In addition to the power to amalgamate, it may also be in the State's interest to craft legislation to preemptively settle conflicts between oil and gas extraction and carbon sequestration (meaning which use is dominant or prioritized), how to implement co-location of CCUS and existing oil and gas facilities, and finally, how best to transition a producing oil and gas field (perhaps one using CO₂ for enhanced oil recovery (EOR) to a project permanently sequestering CO₂ and specifically how to transfer end of field life responsibilities for facilities persisting beyond the current oil and gas operator.

Feedback Summary

Symposium members were asked what geologic or correlative rights factors the AOGCC, the pooling agency in Alaska, should consider when determining whether to amalgamate property rights, how to ensure collocation of CCUS and oil and gas operations occur safely and with minimized use conflicts while still ensuring the State is maximizing the utilization of its resources consistent with its constitutional mandate and, finally, what role the parties to a CCUS project have in negotiating dismantlement agreements for the re-use of existing infrastructure being transferred to a CCUS operator.

Since the AOGCC already has a functioning model for managing these kinds of issues, with a record of success spanning decades, there was consensus they should continue to fulfill this role for CCUS matters and be empowered to weigh factors in much the same way as is permitted for oil and gas matters. Participant feedback indicated statutes and regulations will need to clarify the authority for AOGCC as arbiter for

correlative rights on CCUS resource ownership matters, as a corollary to how codification of pore space ownership in statute would also provide certainty with these authorities and for owners and applicants. As is already the case with oil and gas, public notice and opportunity for public input should be integral to the CCUS process. Generally, the group agreed that, where possible, the successful framework established by AOGCC for oil and gas should be adopted for CCUS.

One group advocated initiating a CCUS program in areas of the State where property rights ownership is clear and the need for amalgamation and chances for conflicts are low, especially in areas where the risk of contaminating subsurface drinking water is low. This will set up initial CCUS projects for success.

Other areas of rights for State agencies to consider will include how to address the interface between federal and state rights and whether there should be a minimum threshold of voluntary participation for compelling pooling. It will also be necessary to address conflicts with adjacent oil and gas or mineral extraction operations. One important area of concern is balancing the primacy of some resources over others. This could be done by establishing a hierarchy in statute of dominant resources so there is transparency and stability about what collocated operations can expect before investment. It may also be wise to not allow CO₂ storage to condemn future mineral extraction. Complete segregation from oil and gas operations and continuous plume monitoring were also suggested. However, this concept may shift over time as the relative value of carbon sequestration increases vis-à-vis oil and gas extraction.

Group members were particularly concerned about how a pooling agency might segregate liability between legacy infrastructure and new operations (*e.g.*, if a plume contacted an old wellbore, would the former well owner be liable if the plume degraded its integrity?). There were also questions about liability or compensation if a plume unexpectedly migrates to pore space not part of the initial CCUS project. Thus, certainty regarding liability at different stages of the CCUS project lifecycle was an important theme among group participants. An emerging CCUS issue is pressure interference across leases; although the plume itself may not extend, the pressure wave that advances ahead of the plume may affect offset acreage.

Infrastructure in Alaska's oil and gas provinces is aging, and the necessity of dismantlement, removal, and restoration (DR&R) is becoming apparent for some assets. However, use of existing well bores, well pads, pipelines, roads, and other facilities may be an efficiency opportunity for the CCUS industry.

When CCUS projects reuse existing infrastructure, the group identified the following concepts to be considered by the State in negotiating DR&R liabilities:

- the laws and regulations should provide a framework to responsibly maximize resource development (including CO₂ storage) benefits to the State;
- the State should *facilitate* negotiations among pore space owners, resource owners, and surface owners, especially in cases where private agreements are not reached;
- the State should establish performance standards for storage operators;
- the State should provide guidance on what types of equipment can be repurposed for CCUS, recognizing facilities with long-term value and defer DR&R appropriately;
- the State could have final approval of private entity DR&R agreements.; and
- the State should maintain the practice of liability for legacy oilfield infrastructure on the oil and gas party when not used in a CCUS project.

3. Long term liability

The CCUS industry is rapidly evolving with many sequestration projects still in very early stages. Post-closure risks, while understood to be technically manageable, are not yet sufficiently characterized for the commercial risk market to have fully emerged. Specifically, a CO₂ plume may continue to migrate in the subsurface following the cessation of injection activities. The EPA sets a default post-injection monitoring period of 50 years. This monitoring may include monitoring wells and other surface remote devices to track whether CO₂ is migrating or escaping.

Given the protracted caretaking timeline of a facility, well beyond its profitable activities, other sovereigns are envisioning a role for the jurisdiction to play in post-closure site management and in determining who will hold title to the injected CO₂. Simply stated, states endure while corporations do not. Carbon Storage Trust Funds are a ubiquitous tool adopted in other jurisdictions for dealing with the costs of long-term management. There are multiple policy choices imbedded in how trust funds are established and managed. We asked the work group to provide feedback on a few challenging aspects of post-closure liability.

Feedback Summary

Symposium groups were asked which of the three post-closure liability options—ranging from no liability assumed by the sovereign, limited liability to the sovereign under certain terms or circumstances, or the sovereign assuming all liability—would be most prudent for developing CCUS and what major concerns must be addressed to make the preferred option viable. All groups recommended the State play a role in post-closure site maintenance and liability. There was variation in the degree of liability the State should assume, but consensus was supportive of a discretionary transfer to the State after an appropriate period and satisfaction of requirements, subject to a public notice and comment process. Any transfer would need to clearly enumerate the specific liabilities assumed, secured with funding commensurate to meeting these obligations. The State may also wish to consider adopting a limited liability role initially and potentially scaling up as the post-closure period matures.

When asked if the State's role would differ if it were not the pore space or surface estate owner, several points of agreement were identified. Most participants agreed the State has the most enduring long-term responsibility post closure, regardless of pore space ownership. It was noted there is already established spill response and mining reclamation programs with the State covering non-State lands (*i.e.*, private lands, including those belonging to Alaska Native corporations, and federal lands). These models could provide helpful insight in defining post-closure roles.

Questions remain about the relationship between the State and projects on federal or private lands. Some recommended against assuming any liability for projects on federal lands. There may also be conflicts about post-closure roles on lands belonging to Alaska Native Corporations. Where liability may be transferred to the State from another surface or pore space owner, surface facility DR&R should be completed before transferring liability. Signed agreements should be in place regarding liability and title to injected CO₂ for projects on non-State lands. It may be best to tie the matters of long-term monitoring, long-term liability, and title to injected CO₂ together as mutually inclusive rights and responsibilities.

Options and concerns were solicited for how to construct a "carbon storage trust fund," which could take several forms and would be part of an overall framework of financial assurance for liability of a carbon

storage project. Overwhelming support was expressed for pooling trust funds, rather than allocating storage fees to discrete project accounts. Some noted pooling funds could incentivize individual project operators to reduce financial liability. In addition to the regular pooled fund contribution, additional allocations could be required if the size or risk associated with a project is sufficient. Some also recommended indexing rates to inflation to protect the value of the fund, given the extended timeframe expected for CCS project operations and post-closure monitoring. In the Alaska legal context, implementation of a “trust fund” will require further review by legal counsel of the implications of a dedicated fund and identifying a mechanism to ensure trust funds remain available for their intended purpose year-to-year.

4. Fiscal/incentives issues

The development of a CCUS industrial sector in Alaska has the potential to impact the State fiscal system in several positive ways. Increased industrial activity can lead to higher State corporate income tax receipts, as well as potentially increasing local sales and property tax receipts, and CO₂ injection for enhanced oil recovery may increase oil production tax receipts. However, some aspects of CCUS may interface with the State’s existing fiscal system in unexpected ways. Care should be taken to understand and address these issues in a way that encourages CCUS activities in Alaska without unanticipated or unconsidered impacts to state revenue.

The Alaska Corporate Income Tax adopts the Federal Income Tax Code, including the 45Q Tax Credit (which is scaled/apportioned based on Alaska tax code and taxpayer apportionment) for corporate taxpayers, including (for multi-state taxpayers) for CCUS projects located outside of Alaska. Alaska could choose to decouple from the Federal 45Q tax credit or adopt an alternative system.

Alaska has a statewide oil & gas property tax (2%) and local property taxes (ranging up to 1.8%). Other states with comprehensive CCUS legislation have adopted property tax measures ranging from regular taxation through partial and general exemptions for CCUS. CCUS property could be bifurcated between statewide and local tax rolls, and the State may wish to consolidate CCUS property into one or the other systems. Additionally, the State will want to ensure its other fiscal statutes are updated and conformed with any changes made regarding CCUS fiscal incentives.

Feedback Summary

When asked if the State should financially incentivize CCUS projects, the group recommended keeping the tax structure as simple as possible and not create incentives beyond those provided at the federal level. Some also advised avoiding duplicative taxes for storage operations collocated with existing resource extraction operations. Others added the State should minimize access costs, such as for leasing and permitting, instead of offering tax-oriented incentives.

Some participants supported offering tax exemptions, such as property tax relief during the capital recovery phase of a project but avoiding credits that create fiscal obligations. Clarity was also requested as to whether the value of injected CO₂ is subject to property taxes. Another option for incentivizing projects could be to direct the Alaska Industrial Development and Export Authority ([AIDEA](#)) to offer low-interest infrastructure development loans to CCUS developers. It was also cautioned Alaska should only make 45Q credits that flow through the state tax system applicable to Alaska-based projects. Another concept could be to connect incentives to a future return in revenue, such as for EOR projects resulting in greater royalties, or in the case

of industrial usage of the CO₂. An example of industrial CO₂ use provided would be to ship it to local greenhouses to amplify domestic fruit and vegetable production.

5. Class VI primacy

The US Environmental Protection Agency (EPA) classifies types of injection wells and sets regulatory standards for safety pursuant to the Safe Drinking Water Act. The advent of CO₂ injection prompted EPA to develop a new classification of injection well – Class VI – to address the unique risks, such as pressure and corrosion, posed by concentrations of injected CO₂.

States are encouraged to seek primacy for some or all categories of injection wells to localize permitting and oversight. The oil industry generally prefers working with state agencies because they are typically more responsive, possess greater regional expertise, and—perhaps most importantly—can usually process permits faster. If Alaska were to seek primacy and identify milestone timelines and expected schedules for permit issuance, this clear regulatory process would likely encourage CCUS projects.

Alaska already has primacy for Class II wells, with about 1,500 permitted for enhanced oil recovery (EOR) injection, but it does not have Class VI primacy. Few states do. North Dakota and Wyoming have received primacy, and four other states are seeking it. For AOGCC, Alaska’s regulatory body for permitting wells for oil, gas, and geothermal operations, to seek Class VI primacy, it would require new statutory and regulatory authority, inspector certification and training, funding in the approximate range of \$300,000 to \$1,000,000 annually to support new personnel and software, and a three-to-five-year timeline to pursue the authorization with the EPA.

Operationally, class VI wells are a central component to CCUS projects and CO₂ storage injection. Seeking Class VI primacy would send the clearest signal to prospective CCUS storage operators that Alaska is pursuing a CCUS program and attracting investment in the state. Some funding is available through the IIJA to stand up the program, but it first requires budgetary commitment from the legislature, including receipting authority for any potential federal funding. Once running, permit and injections fees would likely cover ongoing operating costs as the number and type of CCUS projects expands.

Feedback Summary

Overall, the group recommended the State commit resources to seek Class VI well primacy with a goal toward having shorter permitting and approval timeframes. The benefits of local expertise, combined with a more expeditious review process than the EPA, were noted to potentially accelerate project timelines and thus increase commercial viability. Additionally, having primacy over both Class II and Class VI wells would allow for a single regulating agency to provide clarity on when Class II wells may have to transition to Class VI, ensuring the appropriate well closure standards are implemented. Hosting both within AOGCC would avoid agency regulatory conflict between AOGCC & EPA over injection well regulation.

There was some discussion as to whether there is sufficiently understood industry demand to justify the cost of a Class VI well program. Others noted broadcasting intent for primacy could attract potential developers to choose Alaska for projects. The legislature, at the least, could authorize AOGCC to seek primacy (utilizing “may,” not “shall” statutory language) so it may initiate the process when it has developed the capacity to do so successfully. Sooner rather than later may be necessary to take advantage of federal funding opportunities included in the IIJA. Further, the AOGCC, as the subsurface regulator for oil and gas activities and likely

regulator of CCUS subsurface activities, can ensure operational plans for both types of activities do not interfere with one another.

Conclusion

From this feedback, the following recommendations are highlighted for potential legislation and policy development:

State property rights & licensing

- Adapt existing oil and gas leasing methods for use of pore space for CO₂ storage, including expansion of current oil/gas leases to cover CCUS; holding competitive lease sales and areawide programs; and exploration licensing in frontier areas.
- Establish a mechanism to convert existing oil and gas leases into CO₂ storage leases to extend the value of legacy fields and infrastructure, making depleted oil and gas reservoirs more readily available for CCUS projects.
- Consider a right of first refusal for existing oil and gas operators where storage projects are proposed.
- Establish requirements for leasing or licensing projects to consider the operator's capability to safely, effectively, timely build and operate a project, and provide an identified CO₂ source for injection, rather than simply lease to the highest bidder.
- Establish a mechanism to encourage CCUS projects to move forward and not allow pore space to simply be locked up or warehoused for speculative future use.

Amalgamation of property rights & mineral interest conflicts

- Grant authority to AOGCC for injection, pooling, and correlative rights adjudication related to CO₂ storage in the same way it has for oil, gas, and geothermal resources.
- Specify the appropriate threshold, if any, for compelled pooling.
- Establish a process or processes for resolution of conflicts and liabilities between CO₂ storage facilities and existing oil and gas infrastructure, and provide for clarity on DR&R responsibility where legacy infrastructure is repurposed for CO₂ storage operations.
- Establish the State as the arbiter of agreements among pore space owners, resource owners, and surface owners.
- Address the liability, both financial and legal, of a force-pooled owner.

Long-term liability

- After closure, State should assume some degree of long-term liability whenever legally possible.
- Develop framework for the State to accept transfer of liability and title to CO₂ when assuming monitoring and management responsibility, regardless of land ownership but subject to financial protections and agreements, as necessary.
- Implement a pooled trust fund for long-term monitoring and management after storage closure.
- Investigate the legal mechanism to constitutionally protect such trust funds.

Fiscal/incentives

- Keep the tax structure simple, avoiding duplicative taxes.
- Consider minimizing permitting costs and providing tax exemptions to encourage CCUS projects (rather than direct fiscal incentives) and clarify what aspects of CO₂ injection operations and infrastructure, such as the value of injected CO₂, are subject to taxation.
- Consider, as other states do, a tax holiday or deferred “start-up” period for CCUS property.

Class VI well primacy

- Authorize AOGCC to seek primacy (utilizing “may” not “shall” statutory language).
- Appropriate funds commensurate with the costs seen by other states for starting the primacy process with U.S. EPA and enable the State to receipt available funds for investigating Class VI primacy.

As stated above, this summary is intended to be a resource for policy makers, industry, and the public as CCUS opportunities in Alaska are evaluated. These highlights are not intended to ignore the breadth of recommendations provided by the stakeholders. In addition to the broader summaries provided for each topic in this paper, submitted written materials from the meetings are also available for review.