

ARAPAHOE COUNTY PLANNING COMMISSION October 15, 2024 6:30 P.M.

<u>SUBJECT: STUDY SESSION ON CASE NO. LDC23-005 – OIL AND GAS LAND DEVELOPMENT CODE AMENDMENT</u>

Ava Pecherzewski, Development Review Planning Manager, Public Works and Development Department

Jason Reynolds, Planning Division Manager, Public Works and Development Department

BACKGROUND

In 2019, the Colorado legislature passed Senate Bill SB19-181, which granted local government more authority in regulating oil and gas drilling activities in Colorado. With the removal of State preemption over oil and gas development, Arapahoe County staff began the process of crafting local regulations to govern site approval for oil and gas wells and facilities. On November 9, 2021, the Board of County Commissioners (BOCC) adopted oil and gas regulations in the Arapahoe County Land Development Code. These regulations provided an administrative path to approval, provided the plans complied with regulations, with the option to seek deviations from code standards through a public hearing process with the BOCC if requested.

In March of 2023, the BOCC directed staff to prepare amendments to the oil and gas regulations, in order to better align regulations with neighboring jurisdictions and industry best practices. The Board directed staff to consider increasing setbacks from public water reservoirs as well as explore increasing setbacks from occupied buildings (homes, schools, etc.) and to include additional regulations for air and water monitoring. After extensive research, public outreach, and community stakeholder meetings, staff presented an amendment to the regulations that required a one-mile setback from reservoirs unless the facility is downgradient, then a 3,000-foot setback would apply.

In November of 2023, the BOCC revised the reservoir setback to provide an ability for operators to request a shorter setback, with approval from the BOCC, but in no case can be closer than 2,000 feet from the reservoir. In this code amendment, the BOCC also adopted greater setbacks from occupied buildings, platted lots less than 15 acres, landfills and designated outdoor areas to 3,000 feet, and provided a process by which an applicant could request a shorter setback. The amended regulations also provided enhanced language regarding air and water quality monitoring and increased neighborhood meeting notification requirements.

In October of 2023, the BOCC directed staff to prepare additional amendments to the Oil & Gas Regulations, including:

- Create requirements for financial assurances;
- Include additional requirements for air and water quality monitoring;
- Disallow commercial injection wells;
- Create an inspection program;
- Increase reverse setbacks.

Over the past several months, staff have been conducting research on best practices and have reviewed regulations in other jurisdictions to determine the best requirements for Arapahoe County. Staff shared draft changes to the regulations with the BOCC in July of 2023 and the Board directed staff to conduct public outreach and seek comments. Since there has been a significant increase in oil and gas development in the eastern county and that is anticipated to only increase in the near term, this project has an ambitious schedule. These Phase 2B regulations focus on site operations and monitoring; with pending applications, it is important to have additional protections in place before drilling commences. The Board asked staff to share the draft regulations and public comments with the Planning Commission in a study session on October 15st with a public hearing for a recommendation on November 12th, followed by a public hearing with the Board on December 10th.

After the public outreach and comment period was concluded, staff reported back to the Board on September 24th what the major themes were in the public and industry comments, and the Board directed staff to make adjustments to the draft regulations based on the feedback.

This study session will summarize the proposed changes to the oil and gas regulations and will discuss what public outreach efforts were made. Staff would like the Planning Commission to review the proposed draft regulations and provide feedback and input with any concerns or recommended changes.

Public Outreach

The draft regulations (Attachment 1) were posted on the County's website between July 29th to September 6th, 2024, for public comment. The website provided a portal in which the public could submit comments directly to the website or upload a prepared letter. An email blast was mailed out to all stakeholders on July 29th and advertisement of the draft regulations was posted on the County's social media accounts and mentioned in County newsletters. In sum, there were a total of 73 comments in the website portal (Attachment 2) and 21 individual letters submitted from stakeholders (Attachment 3).

An open house was held at the Arapahoe County Fairgrounds on Tuesday, September 3rd, 2024, from 5:30-7:00 p.m. Email blasts and reminders were sent out to stakeholders and the meeting was advertised on County newsletters and social media accounts. Approximately 100 attendees were present. Staff provided "stations" where the public could comment on different aspects of the draft oil and gas regulations by writing down comments/questions on sticky notes. In sum, there were a total of 252 sticky notes with comments from the public, which are transcribed and summarized in Attachment 4.

PROPOSED REGULATION SUMMARY AND ANALYSIS

Financial Assurances

Financial assurances are often required of oil and gas operators to ensure that costs associated with decommissioning an oil and gas facility are covered, in the event the operator defaults on the facility. These financial assurances are typically in the form of a bond, but can also appear as an irrevocable letter of credit, or cash deposit. Currently, the State requires financial assurances from oil and gas operators, however, these amounts are typically low and would not cover the entire costs of plugging and abandonment. The BOCC directed staff to update our provisions to require financial assurances for our county based on best practices in other jurisdictions. Staff reviewed financial assurance requirements in other municipalities, completed research on typical costs for plugging and abandonment ("P&A"), and developed a code amendment that requires local financial assurances for new oil and gas well drilling activity. At their July 2024 study session, staff presented a range of options for a flat amount to be required per well. The Board chose \$95,000 as this appeared to align with other municipalities as well as what the ECMC identified as the average cost of P&A. The draft regulations set up a financial assurance requirement of \$95,000 per well to cover the cost of Plugging and Abandonment (P&A). This amount is to be adjusted for inflation annually dependent on the Colorado Construction Cost Index, which is more applicable to P&A construction activities that an overall consumer price index. Additionally, the draft regulations require operators to provide evidence of general liability insurance with a minimum of \$1 million per occurrence, and environmental liability coverage of at least \$5 million per pollution incident.

Proposed requirements include:

- Amount The financial assurance must be at least \$95,000 multiplied by the number of approved wells on the pad, adjusted annually for inflation. This ensures there are sufficient funds to cover the costs of plugging and abandoning and site reclamation, protecting the environment and public interest. The guarantee shall be in a form acceptable to Arapahoe County as specified in the regulations.
- Term The assurance lasts until all wells are properly plugged, abandoned, and the site is reclaimed to the standards, or until alternate assurance is provided and approved by the Director of Public Works and Development. This ensures ongoing financial coverage throughout the lifecycle of the project reducing potential liabilities for Arapahoe County.
- Insurance Requirements Specifies mandatory insurance coverage to protect against operation risks, such as bodily injury, property damage, and environmental pollution. Additional insured endorsements extend protection to Arapahoe County and its officials, minimizing financial risks associated with operational hazards.
- Low Producing Wells Requires financial assurance for wells that become low-producing, ensuring ongoing financial responsibility regardless of well productivity.
- Corrective Actions Stipulates forfeiture of the performance bond if corrective actions are needed due to Operator non-compliance, covering expenses incurred by Arapahoe County.

• Transfer/Sale of Facility – Requires assessment of compliance status before transfer. With plans for any necessary corrective actions. This ensures continuity of financial responsibility through ownership changes, preventing gaps in regulatory compliance.

General feedback from the public about financial assurances is that the proposed \$95,000 in the draft code is not enough to cover the cost of plugging and abandoning a well and suggestions ranged from \$120-\$130,000 to \$500,000 per well. Others commented that the minimum insurance coverage requirements were not enough and should be raised.

The American Petroleum Institute (API) and Colorado Oil & Gas Association (COGA) submitted a joint comment letter in which they wished to remind the County that their authority does not include downhole work, including plugging and abandoning, as this is within the jurisdiction of the ECMC. The proposed amendment provisions rely on ECMC's approval of the manner and adequacy of the plugging and abandoning the well and adequate surface reclamation of the pad site as provided in the regulations for purposes of releasing assurance. If the operator does not plug and abandon the well, the financial assurance will provide funding to pay for the plugging and abandoning of the well in accordance with ECMC rules. The proposed regulations do not purport to regulate any down hole activity associated with the plugging and abandoning of a well.

At their September 24, 2024, study session, the BOCC directed staff to discuss the proposed financial assurance amount with the Planning Commission and give them a range of options to discuss and recommend for final approval in the regulations. Staff has researched the costs of plugging and abandonment in both Colorado and nationwide. As expected, the ranges vary dependent on the geographic location, so there isn't a "one size fits all" category for decommissioning of oil and gas facilities.

The ECMC does not have a flat-fee; the amount of financial assurance is dependent on the operator's anticipated average daily per-well production and the number of wells operated. If an operator has less than 50 wells, their financial assurance is \$12,000 per well. If the operator has between 50-150 wells, the amount decreases to \$10,000 per well. If an operator has between 150-1,500 wells, the financial assurance is \$5,000 per well. This amount decreases to \$3,000 per well if the operator has between 1,500-4,000 wells. Low producing wells pay 10% of the total number of wells. The state's financial assurance is far below the actual cost of plugging any individual well and the County's is intended as a supplement to assure that the public is not stuck with any of the costs.

Other jurisdictions like Larimer County require \$93,000 per well and Commerce City requires \$90,000 per well. Broomfield bases their financial assurance per linear foot of wellbore, but the minimum amount is \$100,000. Adams County does not require a flat-fee but instead requires

operators to submit a report noting what the anticipated costs of P&A would be for that project and the financial assurance amount is derived from that report.

Staff have researched the costs of decommissioning. The ECMC estimates that well-plugging costs an average of \$92,710 (see attached Orphaned Well Program FAQ, Attachment 5) and, as noted above, Larimer County requires \$93,000 and Commerce City requires \$90,000 while Broomfield requires a minimum of \$100,000. The BOCC directed staff to require \$95,000 in the draft regulations to be in alignment with these other jurisdictions and with ECMC estimates. After hearing feedback from community that this amount was too low, the BOCC directed staff to take a closer look at decommissioning costs and to provide the Planning Commission with a range of options for recommendation in the final version of the regulations.

An example of something on the higher end, in 2021, Adams County school district had to pay over \$3000,000 to decommission three abandoned wells near a planned middle and high school (see attached news article in Attachment 5). If we use that average of \$100,000 per well in 2021 dollars and adjust that for inflation, that comes to approximately \$128,320 per well in today's dollars. This could be another option that the Planning Commission can consider as a baseline fee.

A June 2024 report from Carbon Tracker (attached) asserts that in Colorado, there are an expected 48,000 wells that need decommissioning at an estimated cost of between \$6.8 to \$8.5 billion; this equates to a range of between \$142,000-\$177,000 per well.

Using these three examples, the Planning Commission is being asked to make a recommendation on a low end, middle range, and higher end financial assurance requirement. The three options that staff is putting forth are:

- \$95,000 the amount in the current draft regulations and consistent with other nearby municipalities;
- \$120,000 an amount that takes a real-life case example of remediation from 2021 and adjusts for inflation to current dollars;
- \$150,000 an amount estimated in the Carbon Tracker report after extensive research into Colorado oil and gas industry costs for decommissioning.

Staff recommends establishing a \$95,000 financial assurance because that represents local estimates and multiple data points from the state agency tasked with regulating oil and gas in a manner that protects public health, safety, welfare, the environment and wildlife resources.

Air Quality Requirements

Currently, the State of Colorado requires air and water quality monitoring at oil and gas facilities through the Colorado Department of Public Health and Environment (CDPHE) and the Energy and Carbon Management Commission (ECMC). Feedback from the public at last year's rulemaking hearings suggested the County enact more protective rules for air quality reporting. The BOCC directed staff to further enhance the County regulations adopted in November 2023 for air quality monitoring, and staff conducted extensive research into additional requirements, in collaboration with staff from the Arapahoe County Public Health Department. The proposed regulations focus on best management practices for *avoiding and minimizing* (rather than mitigating) releases of emissions which impact air quality. In current regulations, the operator is required to test for air pollutants prior to drilling to measure for a baseline, and conduct continuous air quality monitoring during the drilling, completion, and production phases.

Proposed additions include:

- Emphasis on Avoidance Shifting from minimizing to avoiding harmful emissions and impacts represents a more proactive approach to air quality protection. More details regarding pollutants to be monitored and procedures for baseline testing.
- Detailed Monitoring Requirements Enhanced detail in monitoring requirements ensures more comprehensive and accurate tracking of air quality impacts. Proposed additions add several new requirements aimed at further reducing emissions and ensuring compliance with more stringent standards.
- Specific Sampling Frequency and Triggers Specifying sampling frequencies and automatic triggers for sample collection improves the responsiveness and effectiveness of air quality monitoring.
- Operational Changes to Minimize Emissions Introducing specific operational changes provides clear guidelines for operators to reduce emissions, potentially leading to better compliance and air quality outcomes.
- Enhanced Reporting Requirements More detailed reporting ensures better transparency and accountability, facilitating improved regulatory oversight. These additions are crucial for enhancing the effectiveness of air quality regulations, ensuring better protection for public health and the environment.

Feedback from community was that they would like to see real-time public access to the air quality reporting and data. Staff is certainly open to this proposal, once the County has full-time staffing and capacity to create an online reporting system. A suggestion was also made to set up a citizen advisory group or committee to ensure transparency and trust. Other suggestions included requiring operators to require electrification in all steps of the process, given ECMC's recent approval of the Lowry Ranch Comprehensive Area Plan which included a condition requiring electrification for all Lowry Ranch CAP sites. Arapahoe County's existing regulations encourage the use of electric equipment for noise reduction and require electric-powered

permanent production equipment, where available. Based on this feedback and the ECMC's mandate for the Lowry Ranch CAP, staff reminds the Commission that the current regulations encourage electric equipment and drill rigs, unless electric power is not available.

The American Petroleum Institute (API) and Colorado Oil & Gas Association (COGA) submitted a joint comment letter in which they suggested the County clarify what a "health guideline" is when setting benchmarks; staff did consult with Arapahoe County Public Health and changed that to "CPDHE Health Guideline Values." They also request that the best management practices outlined in the draft regulations be more flexible and not required but recommended. They also ask for clarification on the requirement for an infrared camera video and ask if there are other alternative methods of evidence delivery that can be used, and they ask for clarification on when quarterly reports would be due so as not to conflict with similar reporting to the State. Staff recommends we revise this section to note that that a copy of the State report be sent to Arapahoe County as well in order to avoid redundancy.

At their September 24th study session, the Board directed staff to add a clause in the regulations noting that the operator and their monitoring consultant are required to provide public access to air quality monitoring data in a manner approved by staff. Staff has added this clause to the draft regulations.

Additional Water Quality Monitoring

The proposed regulations require more robust baseline water sampling requirements for both groundwater and surface water by requiring a sampling and monitoring plan, with testing required within a half-mile radius of the facility of both upgradient and downgradient water bodies. Operators are also required to conduct water sampling and monitoring within six months of drilling and every 12 months after production. If contamination is noted, a follow-up test and inspection is required within six months.

Feedback from community indicates that they would like monitoring to occur more frequently than once every 12 months after production, with suggestions ranging from once every six months to every three months. It was also requested that monitoring be done by an independent third-party consultant. Currently, the regulations require operators to hire a licensed environmental consultant to complete the testing and staff believes that this meets the standard for a third-party, as they are required to put their stamp on their report. Others commented that they would like water sampling to be extended as far as two miles and that continuous sampling should be required at the Lowry Landfill. Finally, it was recommended that all data should be accessible to the public.

At their September 24th study session, the BOCC directed staff to investigate with the State as to whether it would be appropriate or necessary to conduct water monitoring more frequently than

every 12 months after a well has completed production, and whether there are any requirements to test water sources further out if a leak is detected. Staff checked with the Colorado Department of Public Health and Environment (CDPHE) and were informed that when a spill is reported to CDPHE, they do require subsequent testing to confirm the extent of the impact when a leak or spill is detected.

Staff researched data on the frequency of leaks that impacted surface water from wells in the State. ECMC data on Arapahoe and Adams counties over a five-year period revealed that there was only one instance of a leak that impacted surface water in Adams County in 2021 (15 bbls) and three instances in 2023 (9 gallons, 3 gallons, and unknown quantity based on the report). Arapahoe County had zero reported spills and no waterways were reported to have been impacted during the last five years, according to publicly available data. Accordingly, staff does not recommend more frequent water testing given that the data does not suggest more frequent testing will yield better results. Moreover, with Colorado's arid climate, it is difficult to conduct water sampling on a scheduled basis. For example, the Lowry Landfill conducts annual stormwater sampling or when there is a rain event. However, there is often no data to gain because there isn't much water available to test. The same premise can be applied with water sampling in proximity to a well that is in post-production; testing more frequently than once every 12 months may not yield any different results.

The initial draft regulations specified that water monitoring had to include perennial, intermittent and ephemeral water bodies. The American Petroleum Institute (API) and Colorado Oil & Gas Association (COGA) submitted a joint comment letter in which they suggested the definitions for ephemeral stream and intermittent stream be defined to be more closely in alignment with EPA definitions, and they recommended this section be more refined on when testing of intermittent and ephemeral waters is necessary, and they note that data from that testing is likely to be flawed because these streams are dependent on inconsistent weather conditions. At their September 24th study session, the Board discussed this with staff and staff noted that it would be more enforceable if we defined the term based on the Colorado definition as "Waters of the State" (as defined in the Colorado Revised Statutes), which includes these water types. The Board directed staff to revise the draft regulations to remove those terms and replace with "Waters of the State", and these are included in the draft regulations.

Commercial Injection Wells

In the course of oil and gas drilling, operators may inject used, contaminated water from the hydraulic fracturing process into underground wells placed underground into deep rock formations for disposal. While these injection wells do have layers of protective casing, concerns remain regarding potential leaks and compromising the water table. Commercial injection wells also generate a significant amount of truck traffic and have the potential to draw that traffic from well sites outside Arapahoe County, which would increase wear on county roads. Finally,

commercial injection wells have created seismicity in Colorado. While the state responded to those events by requiring slower injection rates and monitoring, prohibiting commercial injection wells for the disposal of wastewater removes the risk altogether. The BOCC directed staff to prohibit the use of commercial injection wells in Arapahoe County, and staff has added a code section clarifying that this activity is not permitted.

For the most part, no negative feedback was provided about the plan to disallow commercial injection wells. It was noted that trucking out produced water does lead to increased traffic. However, the increased traffic is not expected to be significant and would outweigh the negative risks associated with injecting produced water underground, which include the potential for induced seismicity. Further, allowing injection wells in Arapahoe County could attract heavy truck traffic from other jurisdictions, increasing wear on our already stressed road network. Concerns were also raised about where the receiving sites were located and what those sites do with the water; because the receiving sites are not located within Arapahoe County, we do not have jurisdiction to regulate such matters.

Finally, there were several comments in general about the amount of water required for fracking and whether there is sufficient water available in Colorado with dwindling aquifers. One of the code amendments requires operators to provide the County with evidence of an adequate water supply, including a requirement for an executed Water Delivery Agreement.

Reverse Setbacks

The regulations set minimum distances that new oil and gas facilities must be set back from existing structures and bodies of water. Reverse setbacks are applicable to new development that is proposed from an existing oil and gas facility. Currently, the Land Development Code requires new developments to be set back 250 feet from an oil and gas facility of any status (permitted but not drilled yet, drilling, completing, producing, active gas storage, injecting, shut-in, temporarily abandoned, dry and abandoned, or plugged and abandoned prior to 2014). The reverse setback for new developments proposed adjacent to a plugged and abandoned oil and gas well that was abandoned in 2014 or later is 150 feet (the state adopted more rigorous P&A standards in 2014). During community discourse last year, there was concern raised that these setbacks were too close and it was recommended that the reverse setbacks be expanded. The proposed regulations would expand the reverse setback requirement from 250 feet to 2,000 feet for oil and gas facilities under application review or permitted but not drilled; or to 1,000 feet for oil and gas facilities that are actively producing, shut-in or temporarily abandoned; or 250 feet from oil and gas facilities that are plugged and abandoned. There is a provision noting that this setback only applies to building permits for occupied structures and does not preclude an owner from filing applications for subdivisions and development in proximity to an oil and gas facility.

Feedback from community was that they felt the proposed reverse setbacks were appropriate but could be even larger – 3,000 feet. However, staff reached out to developers within range of existing and proposed oil and gas facilities for comment. Generally speaking, those from the development community are not in favor of increasing the reverse setbacks as this could have implications for their projects. The developer of the Prosper development near Bennett submitted comments that the proposed changes could impact their project since a Preliminary Development Plan was approved with a specified 350-foot reverse setback from existing oil and gas facilities allowed within their development plan. The Sky Ranch developer also provided feedback on the proposed reverse setbacks, noting potentially severe economic impacts to development projects if the setbacks are adopted as drafted. Comment letters are provided in Attachment 3.

Staff shared this feedback with the BOCC at their September 24th study session, and the Board directed staff to include administrative ability to reduce these setbacks when a property owner provides an informed consent document, but in no case can the setback be any closer than 250 feet. Staff has included this language in the draft regulations, including a requirement that a notice needs to be recorded against the property to notify future buyers that an oil and gas facility is planned adjacent to their home or parcel.

Inspection Program

Currently, the State of Colorado conducts inspections on oil and gas wells (both ECMC and CDPHE). However, there are relatively few inspectors for the large number of well pads throughout the state. The BOCC directed staff to look into setting up a County inspection program to be funded by operators through fees. While the operators pay the state for inspection, this County program would be an enhancement to the state's program that is not able to keep up with the inspection demands and therefore increase the level of service (ie inspection performed). County inspectors would be responsible for enforcing County regulations. Staff has included a section in the attached code amendment which establishes an inspection program.

In the course of researching various inspection programs in other municipalities, staff found that there are two different approaches for implementing an inspection program: an independent, standalone program in which the County would be responsible for all costs and creating its own training, procedures and processes, however, these come with high startup costs and require a longer implementation time. The second approach is to enter into an IGA (Intergovernmental Agreement) with the State ECMC. The advantages of an IGA with the State of Colorado are technical advisement through the staffing process, an established training program, access to an Energy & Carbon Management Commission (ECMC) field supervisor for assistance with technical aspects of inspection, access to the State's database, established processes, a quicker program implementation, and cost savings associated with training, equipment procurement and process development. In July the BOCC directed staff to employ the IGA structure with the

state, rather than a standalone program, given that entering into an IGA with the ECMC because of the support, training, and ability to implement the program sooner.

The 2025 draft budget for the County includes one new full-time inspector to report to the new Energy Program Manager (formerly the Energy Specialist position).

The draft code amendment incorporates an inspection program for the County and sets forth fines and penalties for noncompliance. Separately from the regulations, the Board will consider an inspections fee schedule. The draft regulations allow the Public Works Director to shut down activities if there are three or more documented violations in six months, or under emergency situations. The Director is authorized to issue fines up to \$15,000 per day for each violation. The draft regulations do not specify how often each oil and gas facility would be inspected.

General feedback we have received from the public is that facilities should be shut down with a single violation regardless of the scale, and it was recommended that inspections occur monthly or quarterly at a minimum. Other recommendations from the public include shutting down a facility after five neighbor complaints in a 24-hour period about a particular issue. Others commented that they felt the \$15,000 per day per occurrence was not enough to deter operators and recommended a higher amount, some as high as \$100,000 per day.

At their October 1st study session, the BOCC directed staff to add language in this section noting that if inspection fees are in arrears, the applicant may not file any further applications with the County until the fees are paid. The Board also asked staff to create a procedure manual for the inspections program to include details about levels of violations and fines. If these regulations are adopted, staff will work on a procedure manual prior to the inspection program going live on July 1, 2025.

Regulation Clean-Up

Staff have taken the time to clean-up the formatting of the regulations, typos that were found, clarified previous regulations where needed, removed a duplicate section, and moved provisions to more appropriate applicable sections in the regulations. All of these changes are in the Track Changes version of the regulations as an attachment for this Study Session.

Other General Comments Not Related to the Draft Regulations

There were several comments related to setbacks from occupied structures, which are not part of this code amendment. Specifically, members of the community continued to press for longer setback distances between well pads and occupied structures. Requests for five miles and one mile have been received, although the Board evaluated these distances last year during rulemaking on setbacks and chose 3,000 feet as the required minimum setback from occupied

structures. Others have requested that no provisions for shorter setbacks be allowed, such as for downgradient pads from reservoirs, and that all oil and gas applications be required to hold public hearings rather than being administratively approved.

There were many other comments related specifically to the Lowry Ranch CAP applications and comments for those applications are being reviewed under those specific applications and not within this venue for general rulemaking.

ACTION REQUESTED

The proposed new regulations, shown as redlines to the existing Oil and Gas regulations in Attachment 1, reflect recent direction received from the Board of County Commissioners and staff-recommended changes. Staff would like the Planning Commission to evaluate these draft amendments to the regulations and provide feedback and recommendations prior to advancing this to a public hearing before the Planning Commission on October 15th and to the Board of County Commissioners on November 12th.

ATTACHMENTS

- 1. Oil and Gas Regulations Amendments, redlined draft
- 2. Website Comments Summary
- 3. Stakeholder Comments Received
- 4. Open House Comments on Poster Boards
- 5. Research on Financial Assurances