

Energy & Carbon Management Commission (ECMC) 2024 Annual Report to the WQCC and WQCD

February 10, 2025



COLORADO

**Energy & Carbon
Management Commission**

Department of Natural Resources



CO L O R A D O

**Energy & Carbon Management
Commission**

Department of Natural Resources

Energy & Carbon Management Commission (ECMC)

2024 Annual Report

to the

Water Quality Control Commission (WQCC)

and

Water Quality Control Division (WQCD)

of

**The Colorado Department Of Public Health and Environment
(CDPHE)**

In Accordance

with

The August 28, 1990 Memorandum of Agreement

and

The Implementing Provisions of Senate Bill 89-181

February 10, 2025

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List of Abbreviations

APD - Form 2, Application for Permit to Drill

bbl - Barrel. Commonly used as a volume measurement in oil and gas, 1 barrel is 42 U.S. gallons or approximately 159 liters.

BMP - Best management practice(s)

CAP - Comprehensive area plan

CCS - Carbon capture and sequestration

CCUS - Carbon capture, use, and sequestration

CE&PWM - Centralized exploration and production waste management

CDPHE - Colorado Department of Health and Environment

CDPS - Colorado Discharge Permit System

CGS - Colorado Geological Survey

CO - Colorado

COA - Condition(s) of approval

COGA - Colorado Oil and Gas Association

COGCC - Colorado Oil and Gas Conservation Commission (now ECMC)

COGIS - Colorado Oil and Gas Information System

The Commission - The professional commission that is part of ECMC

CPW - Colorado Parks and Wildlife

CPWC - Colorado Produced Water Consortium

DAD - Daily Activity Dashboard

DJ - Denver-Julesburg [Basin]

DNR - [Colorado] Department of Natural Resources

DWR - [Colorado] Department of Water Resources

E&P - Exploration and production [waste]

ECMC - Energy and Carbon Management Commission (formerly COGCC)

EDD - Environmental data deliverable

EIA - [U.S.] Energy Information Administration

EPA - [U.S.] Environmental Protection Agency

EPS - Environmental protection specialists

ft - feet

FTE - Full-time employee

FY - Fiscal year

GIS - Geographic information system(s)

GWA - Greater Wattenberg Area

GWPC - Groundwater Protection Council

HB - House Bill

IEA - International Energy Agency

LGD - Local governmental designee

MMbbls - Million barrels [of oil]

MOA - Memorandum of agreement

MRDB - Master records database

NOAV - Notice of Alleged Violation

NTO - Notice to Operators

OIT - Governor's Office of Information Technology

OGDP - Oil and gas development plan

OGLA - Oil and gas location assessment specialist

P&A - Plugged and abandoned or plugging and abandonment

PUC - [Colorado] Public Utilities Commission

PHMSA - [U.S.] Pipeline and Hazardous Materials Safety Administration

RBDMS - Risk Based Data Management Solutions

SB - Senate Bill

Staff - ECMC staff, when capitalized as a proper noun

tcf - trillion cubic feet

UIC - Underground injection control

WQCC - Water Quality Control Commission

WQCD - Water Quality Control Division





Section 1: Introduction

The Energy and Carbon Management Commission (ECMC), formerly the Colorado Oil and Gas Conservation Commission (COGCC), is an implementing agency for water quality standards and classifications adopted by the Water Quality Control Commission (WQCC) for groundwater protection. This authority was provided by Senate Bill 89-181 (SB89-181) and is restated and clarified by a memorandum of agreement (MOA) that the agencies adopted on August 8, 1990.

Section 5.1 of the MOA specifies that ECMC must report annually to the WQCC and the Water Quality Control Division (WQCD) about how its programs assure compliance with WQCC water quality standards and classifications for the activities that are subject to the jurisdiction of the ECMC.

This 33rd annual report provides an overview of ECMC functions and a summary of calendar year 2024 activities, focusing on groundwater protection programs. Major issues concerning the implementation of water quality standards and classifications are also reported.



Section 2: WQCC/WQCD and ECMC Coordination and Public Outreach

2.1 Inter-agency Coordination

In 2024, ECMC, the WQCC, and WQCD coordinated the implementation of the provisions of SB89-181 and the MOA. ECMC, the Colorado Department of Public Health and Environment (CDPHE), and the Office of Emergency Preparedness and Response staff communicated frequently through email and telephone calls regarding spills at or near oil and gas facilities. ECMC took the lead for all exploration and production (E&P) waste spills.

Key ECMC staff participated in the February 12, 2024, Groundwater Summit with other SB89-181 implementing agencies. The ECMC Director and staff met with WQCD staff (virtually) on June 17th and September 23rd to discuss program implementation and regulatory changes. Other quarterly meetings between the two agencies were canceled due to a lack of agenda items. Typical agenda items include following up on various active investigations, enforcement matters, and E&P waste management practices within the oil and gas industry.

2.2 Public Outreach

ECMC public outreach strategies for effective communication with the public and the regulated industry are described in Sections 2.2.1 through 2.2.5.

2.2.1 Commission Hearings

In 2024, ECMC held weekly or more frequent commission hearings depending on business before the professional commissioners (“the Commission”). The 2024 meetings continued to be held virtually, and public participation in the virtual meetings remained high throughout the year. In addition to regular business meetings, the Commission held several evening “listening sessions,” at which minimal business, besides hearing public comment, was conducted. Although previously held monthly, the frequency of these evening listening sessions has been reduced due to a lack of public interest and participation.

2.2.2 Scheduled Meetings

ECMC staff (“Staff”) participates in regularly scheduled meetings with the regulated community and other interested stakeholders in parts of the state with active oil and gas operations. ECMC has continued hosting monthly “Operator Meetings” to help the regulated community navigate regulatory requirements and guidance documents.

2.2.3 Stakeholder Participation

ECMC continues to solicit participation in regulating oil and gas exploration and production. Stakeholders, including the oil and gas industry, local governments, citizens, other regulatory agencies, non-governmental organizations, agriculture interests, and the environmental community, provide input into permitting, policy development, rulemaking, and other processes. In 2024, Staff and the Commission engaged with stakeholders in various working groups. Due to rulemaking efforts, the commission required the creation of some working groups, such as the Biochar Advisory Working Group and the Produced Water Consortium (CPWC). Other working groups were formed through the ordinary course of business of the Commission, such as the West Slope Task Force.

The Commission is committed to visiting communities statewide and learning about their unique issues and concerns on oil and gas development and production. The Commission shared updates on implementing SB19-181, which changed the mission from “fostering” responsible oil and gas development to regulating in a manner protective of public health, safety, welfare, wildlife, and the environment, and to hear the community’s voice on oil and gas. The Commission met with local governments, community members, environmental groups, disproportionately impacted communities, industry members, and other regulatory agencies.

The Commission conducted stakeholder outreach on cumulative impacts, hosting multiple listening sessions with various stakeholders throughout the year. Additionally, the Commission and Staff held stakeholder meetings throughout the year, including discussions on deep geothermal, meetings with the West Slope operators, and participation in the CPWC.

2.2.4 Local Government Designee Program

ECMC created the Local Governmental Designee (LGD) program via rulemaking in 1992 to provide a conduit of information between local governments and the ECMC. ECMC bolstered the LGD program in 2012 with the addition of local government liaison staff to assist and facilitate participation in the LGD program through training, outreach, and providing information, data, and presentations about specific aspects of oil and gas operations, ECMC rules, use of the ECMC website, and the ECMC’s changing regulatory program under SB19-181. ECMC created the Community Relations Unit in 2018, which includes a community relations liaison working under the supervision of the ECMC communications officer.

As of November 2024, LGD participation includes 55 counties (including two combined city-county governments, Denver and Broomfield), 106 municipalities (besides Denver and Broomfield), and 11 special districts.

In 2024, Staff outreach included the following meetings and hearings:

- Outreach to Local Governments on Carbon Capture and Storage (February 2, 2024)
- Town of Frederick Meeting (February 2, 2024)
- Town of Frederick Meeting (February 5, 2024)
- Town of Frederick Meeting (February 13, 2024)
- Las Animas County Commissioners Meeting (March 5, 2024)
- Huerfano County Commissioners Meeting (March 12, 2024)
- Glenwood Springs Community Listening Session (April 18, 2024)
- Arapahoe County Meeting (May 7, 2024)
- Arapahoe County Local Public Hearing (May 16, 2024)
- Oil and Gas 101 Presentation for LGDs (May 23, 2024)
- Town of Frederick Meeting (June 11, 2024)
- Durango Community Listening Session (July 15, 2024)
- Pueblo Community Listening Session (July 16, 2024)
- Firestone Community Listening Session (July 17, 2024)
- Statewide (Virtual) Community Listening Session (July 18, 2024)
- Erie Local Public Hearing (October 29, 2024)
- Longmont Meeting (December 12, 2024)
- Dacono Meeting (December 12, 2024)
- Severance Meeting (December 12, 2024)
- Berthoud Meeting (December 12, 2024)
- Erie Meeting (December 12, 2024)
- Weld County Meeting (December 12, 2024)

ECMC staff supported issues of local government concern, including local air monitoring concerns and the development of new local oil and gas regulations. In addition, ECMC staff worked to inform community members and LGDs of other events, such as commission hearings, local public hearings, and relevant ECMC news.

2.2.5 ECMC Website

ECMC uses its website to make announcements and distribute information and data. ECMC information and data systems are described further in Section 3.3. ECMC has collected feedback and input from its diverse stakeholders to prepare a more functional and accessible website and is working on a refresh to the website format. ECMC anticipates rolling out the new website design in mid 2025.





Section 3: ECMC Organization

3.1 ECMC Commissioners

The Colorado Oil and Gas Conservation Act (“the Act”), as amended by SB19-181, specifies the composition of the full-time professional Commission.

The Act requires seven commissioners, five of whom are appointed by the governor with the consent of the senate, and two ex officio non-voting members who are the executive directors of the Department of Natural Resources (DNR) and CDPHE or their appointed designees.

The five professional members are appointed by considering the need for geographical representation of areas of the state with high levels of current or anticipated oil and gas activity or employment. Of the five, the expertise required is as follows:

- One appointed member must have substantial experience in the oil and gas industry;
- One appointed member must have substantial expertise in planning or land use;
- One appointed member must have formal training or substantial experience in environmental protection, wildlife protection, or reclamation;
- One appointed member must have professional experience demonstrating an ability to contribute to the commission’s body of expertise that will aid the commission in making sound, balanced decisions;
- One appointed member must have formal training or substantial experience in public health.

Excluding the executive directors, up to three members may be from the same political party. Biographies of the current commissioners are posted on the ECMC website: <https://ecmc.state.co.us/about.html#/commissioners>

3.2 ECMC Staff

ECMC has 212 full-time employee (FTE) positions throughout the state, most of which are concentrated in the Denver office. Staff includes engineers, environmental protection specialists (EPS), compliance specialists, reclamation specialists, location assessment specialists (LAS), permitting specialists, hearings officers, and a variety of other professionals with various expertise. Table 3-1 summarizes each group and their primary functions. The current organizational chart is included as Appendix 1.



Table 3-1. ECMC Groups and Primary Functions

Group	Number of FTE	Primary Functions
Commissioner	5	This unit is composed of 5 full time permanent employee commissioners and is responsible for the direction and statewide strategic public policy for energy and carbon management permitting and production in Colorado. The Commission body conducts adjudicatory proceedings and undertakes rule making and other processes to implement the agency's mission.
Executive	4	This unit is composed of a director, two deputy directors, and a chief policy officer, and is responsible for providing strategic leadership for the agency.
Finance	7	This unit is composed of a manager, a supervisor and five single contributor staff, and is responsible for budget management, legislative and fiscal notes, procurement, purchasing, and expense processing.
Hearings	8	This unit is composed of a manager and seven single contributor staff, hearing officers, program assistants, and a paralegal, and is responsible for hearing application management and administration; the manager is liaison and secretary to the Commission.
Community Relations Unit	4	This unit is composed of a manager and three community liaisons, and is responsible for providing communication and information about ECMC to the public and diverse stakeholders.
Strategic Development	6	This unit is composed of a manager and five single contributor staff, and is responsible for managing strategic plans, projects and programs including leadership and workforce development, records and the public room.
Information & Applied Technology	9	This unit is composed of a manager, two supervisors, and six single contributor staff (research scientists and data managers), and is responsible for website and webform development/support, database management/support, other information systems, and GIS (geographic information system) maps.
Orphaned Well Program	19	This unit is composed of a manager, three supervisors and 15 single contributor staff (environmental protection specialists, reclamation specialists, and program and/or field specialists), and is responsible for plugging orphan wells including orphan site investigation, clean-up, and reclamation.

Quality Assurance, Quality Control and Safety	9	This unit is composed of a manager, one supervisor and seven single contributor staff and is responsible for evaluating the effectiveness of ECOM's business programs, processes, and tools, and developing strategies, objectives, and operational status to ensure high quality products and processes; includes financial assurance, production reporting, and levy collection.
Cumulative Impacts & Energy Transition	14	This unit is composed of a manager, a supervisor and 13 single contributor staff (research scientists and environmental protection specialists), and is responsible for leading the agency's efforts regarding cumulative impacts and environmental justice, the Director's review and administrative approval of matters coming before the Commission and rulemaking processes, and the Renewable Energy Program.
Engineering	21	This unit is composed of a manager, 4 supervisors, and 16 single contributor staff (professional engineers and research scientists), and is responsible for analyzing and permitting downhole wellbore plans, underground injection control (UIC) permitting, flowline integrity, and oil/gas facility oversight, including yearly bradenhead testing.
Enforcement	11	This unit is composed of a manager, two supervisors and eight single contributor staff (compliance specialists), and is responsible for enforcing ECOM rules by taking legal action on operators when they fail to achieve compliance.
Planning & Permitting	34	This unit is composed of a manager, 4 supervisors, and 29 single contributor staff (research scientists and environmental protection specialists), and is responsible for reviewing and analyzing energy and carbon management development plans and comprehensive area plan applications, permitting oil and gas wells, evaluating oil and gas location assessments, cumulative impacts information, and pit permitting.
Compliance	27	This unit is composed of a manager, 5 supervisors, and 21 single contributor staff (scientist technicians), and is responsible for inspecting wells, facilities, and locations; complaint intake and response, management, and resolution; acting as agency contact for responding to emergencies and working with emergency response personnel enforcement.
Environmental	34	This unit is composed of a manager, 5 supervisors, and 28 single contributor staff (mostly environmental protection specialists), and is responsible for responding to spills, remediation projects, pit closures, site closure, complaint investigation and response, environmental projects, interim and final reclamation, environmental database maintenance, and other special projects.

3.2.1 Environmental

The Environmental Unit consists of environmental protection specialists and reclamation specialists that provide oversight during spill and release responses, monitor remediation projects, respond to complaints, and ensure that oil and gas sites are restored to their pre-disturbance conditions following oil and gas exploration and production activities.

3.2.1.1 Spill/Release Response and Remediation Oversight

Spill response by the environmental staff includes onsite inspections, sample collection, remediation oversight, and review of reports, remediation plans, analytical data, and operating practices to ensure the protection of surface water and groundwater following ECMC rules and WQCC standards and classifications. Spills are tracked in ECMC's master records database (MRDB) and can be accessed via the ECMC website. ECMC's oversight of spills, releases, remediation projects, and environmental investigations is discussed in more detail in Section 6 of this report.

3.2.1.2 Centralized E&P Waste Management Facility Permitting

ECMC environmental staff permits non-commercial centralized E&P waste management (CE&PWM) facilities under Rule 907. Generally, these facilities are larger than a typical tank battery or pit that might handle wastes from only one or a few wells. These larger facilities handle wastes from many wells and often from more than one field or lease operated by a single oil and gas operator. These facilities may include lined pits, land treatment facilities, land application areas, drill cuttings, solidification facilities, or tank batteries. A permit is required for these CE&PWM facilities, and as part of the approval process, Staff evaluates the proposed site, operation, financial assurance, potential environmental impacts, and preliminary closure plans. These facilities must have financial assurance equal to the estimated cost for proper closure, abandonment, and reclamation. CE&PWM facilities require local government land use approval, and ECMC staff coordinate with planning, zoning, and other local government staff during the permit review process. During 2024, there were no new CE&PWM facility submissions, no CE&PWM facilities were permitted, and no CE&PWM facilities were closed. There are 52 active centralized CE&PWM facilities in the state.

3.2.1.3 Pit Permitting

Operators may construct pits at oil and gas locations for various purposes, most commonly to contain drill fluids and cuttings, collect produced water and flowback, and reuse and recycle produced water. ECMC permits pits via the Form 15, inspects their operation, and oversees their closure. The LAS and EPS staff review pit permits for construction and operational details and evaluate the environmental setting to ensure the pit can be used without causing adverse environmental impacts. The Director may apply conditions of approval with additional provisions to protect the waters of the state, public health, or the environment. ECMC Rule 901.a also requires operators of existing pits to submit a Form 15, Earthen Pit Report/Permit if the records need to be updated. As of November 19, 2024, ECMC had approved 27 Form 15s, most of which were for existing pits.

3.2.1.4 Complaint Response

A significant part of ECMC's public service and efforts to enhance transparency and public trust is complaint response. As such, ECMC responds to complaints from all parties. Once received through the online intake process or by phone, a complaint specialist first determines if the complaint falls under the jurisdiction of the ECMC regulatory authority. If the complaint is related to another regulatory agency, ECMC formally refers it to the appropriate agency on behalf of the complainant. For complaints under ECMC authority, the complaint specialist determines the appropriate group within ECMC and assigns the complaint to it. For example, the Compliance Unit handles many complaints, such as odor, noise, dust, trash, and other operational issues. The Environmental Unit responds to complaints:

- That allege oil and gas impacts to domestic water wells;
- For which groundwater or surface water may be threatened by spills/releases or the management of E&P waste; or
- That are related to stormwater management and reclamation.

Complaint investigations generally include a site visit during which ECMC staff inspect the location of the complaint. For complaints related to domestic water wells, the environmental unit collects representative groundwater samples. These samples are analyzed at authorized laboratories to determine if oil and gas operations impacted groundwater quality. Regardless of the type of complaint, ECMC staff investigate to determine if there were violations of applicable rules. Where violations are discovered, ECMC issues corrective actions to the operators. In cases where complaints result in the discovery of rule violations, enforcement actions are pursued.

In 2024, ECMC received 213 complaints. The majority (48, or 22.5%) were related to noise. The Environmental Unit was assigned 55 complaints (25.8%) which led to investigation of various allegations related to groundwater and surface water contamination, spills/releases, reclamation, and other environmental threats.

Of the 55 complaints assigned to the Environmental Unit, seven complaints (3.3% of the total) were related to concerns about water quality in various domestic water wells. During water well investigations, ECMC environmental staff collect samples from water wells for laboratory analysis for the parameters listed in ECMC Rule 615.e. ECMC environmental staff review the laboratory results for indications of impacts to the water wells from oil and gas operations. In 2024, none of the seven water wells sampled as a result of complaint investigations were determined to be impacted by oil and gas operations.

In 2024, operators reported the discovery of thermogenic gas in 11 different water wells. These are water wells that operators may sample as required by ECMC Rule 915.e., or as part of an operator's voluntary water well sampling program. The discovery of thermogenic gas in groundwater requires operators to notify the Director pursuant to Rule 912.b.(1).J. The operator that reported the discovery investigates the potential source of impacts as part of an approved Form 27, Site Investigation and Remediation Workplan . Of the 11 water wells with reported impacts, ECMC's review of the operator's investigation suggests that 1 water well may be impacted by former oil and gas activity. Follow-up sampling of the remaining 10 water wells indicated that thermogenic gases are not likely present in the water wells.

3.2.1.5 Oversight of Produced Water Disposal

Over 300 million barrels (bbl) of water are co-produced with oil and gas annually. Approximately 70 percent of this produced water is disposed of or used for enhanced recovery by underground injection. Most produced water that is not injected is disposed within evaporation and percolation pits or discharged under a Colorado Discharge Permit System (CDPS) permit. Disposal facilities may be commercial and subject to oversight by CDPHE or private and subject to oversight by ECMC. To minimize waste and the use of freshwater, many operators reuse and recycle produced water and other fluids for drilling and well completion activities, including hydraulic fracturing treatment operations. ECMC staff review UIC permits, pit permits, centralized E&P waste management permits, and other proposals, including water reuse and recycling plans, to ensure that produced water is handled appropriately. In 2023, House Bill 23-1242 (HB23-1242) statutorily directed DNR and ECMC to take specific measures to reduce the overall freshwater consumption of the oil and gas industry by increasing the amount of produced water that is recycled or reused. The specifics of this statutory requirement are discussed in detail in Section 4.4.

3.2.2 Engineering Unit

The Engineering Unit provides regulatory oversight of flowline and facility integrity, wellbore integrity, and Class II UIC wells. Flowline integrity ensures that a flowline is compatible with the fluids being transported, allowing it to withstand anticipated operating conditions and prevent

failure. Wellbore integrity refers to the design and construction parameters for an oil and gas well that prevent oil, gas, or water from migrating between different geologic formations penetrated by the wellbore. ECMC permits and regulates Class II UIC wells for enhanced oil recovery or to dispose of oil and gas E&P waste. The isolation of all formation fluids, particularly groundwater protection, is routinely addressed and reviewed by ECMC engineering staff over the life stages of all wells.

The Form 2, Application for Permit to Drill (APD) includes a casing and cementing plan to demonstrate how formation fluids will be isolated. The operator lists all potential flow zones (e.g., groundwater, hydrocarbon, disposal), confining formations expected to be encountered in the drilling of the well, and the proposed casing and cementing depths. To protect groundwater, ECMC requires a minimum of 500 ft of cement placed above the shallowest identified hydrocarbon zone and isolation 50 ft below the deepest groundwater zone.¹

Additionally, all existing wells within 1500 ft of the proposed new well are evaluated for adequate formation and groundwater isolation. If an offset well does not meet current isolation standards, ECMC engineering staff add a condition of approval on the Form 2 requiring the deficiency to be remediated before stimulation of the new well. This ensures that old wells, including previously plugged and abandoned wells, do not create a conduit that allows fluid flow between formations or into groundwater during nearby hydraulic fracturing operations.

3.2.2.1 Bradenhead Monitoring

Cement in the annular space between the production casing and the borehole is designed to isolate hydrocarbons and protect groundwater. ECMC ensures that there isn't a migration pathway from hydrocarbon zones to the surface or groundwater zones by ensuring that there isn't a failure in the annular cement. Monitoring this annular space in the surface casing (i.e., the bradenhead annulus) has effectively monitored wellbore integrity. Figure 3-1 depicts typical wellbore construction and shows how gas in the production casing annulus can be monitored in the bradenhead at the surface.

Bradenhead pressures are monitored after drilling and before stimulation. Any wells above the pressure threshold require director approval prior to stimulation.² During hydraulic fracturing, bradenhead pressure on the wells being stimulated and on all wells within 300 ft is monitored.³ If operators see high pressure or evidence of communication, stimulation is immediately stopped, and ECMC is notified. The operator then performs diagnostic testing to determine the next steps.

Wells in Colorado are subject to monthly bradenhead monitoring and annual testing.⁴ Existing wells above the threshold require the operator to perform diagnostic testing and implement a pressure management plan, which may include but is not limited to: cement remediation, fluid displacement, and plugging and abandonment. Additionally, operators must take samples if fluids are present when the bradenhead valve is opened. Samples from the bradenhead annulus and production gas are analyzed for source determination.⁵

During plugging and abandonment, operators and ECMC engineers review wellbore construction (surface casing depths, cement bond logs), bradenhead history (pressure, samples), and all groundwater sources to determine the placement of plugs. Wells with high bradenhead pressure or thermogenic samples may have additional cementing and wait times prescribed as a condition of approval on the Form 6, Well Abandonment Report.

1 Previous rules called out Fox Hills aquifer in the DJ basin, where the new rule calls out all groundwater sources with TDS < 10,000 mg/L.

2 ECMC Rule 419 specifies bradenhead pressure cannot exceed 0.3 psi per vertical foot of surface casing without corrective action being required. Local orders can lower this threshold; for example, ECMC Order 1-232 requires mitigation for bradenhead pressures above 200 psi in the DJ basin.

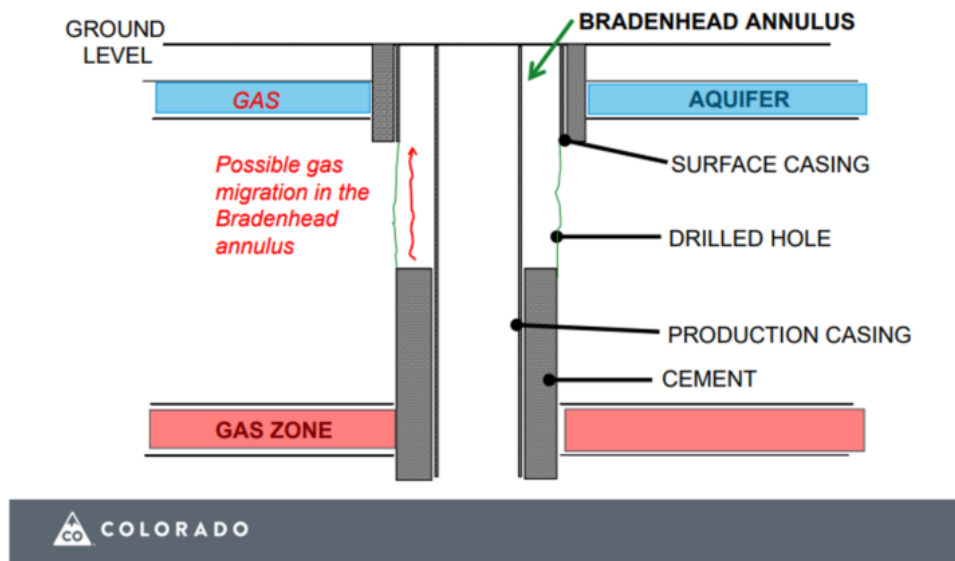
3 ECMC Rule 419.b.(2)

4 ECMC Rule 419.b.(4)

5 Gas samples are analyzed for thermogenic or biogenic isotopes.

Figure 3-1. Bradenhead Pressure Test

THE OBJECTIVE IS TO MONITOR WELLBORES FOR POSSIBLE PRESSURE AND FLUID MIGRATION



Denver-Julesburg Basin Bradenhead Testing Order

Docket No. 181201088 December 2018

3.2.2.2 Underground Injection Control (UIC) Permitting

In April of 1984, the U.S. Environmental Protection Agency (EPA) delegated authority to ECMC (then COGCC) to review, approve, and monitor the injection of E&P waste into Class II UIC wells. ECMC staff coordinates with the Colorado Division of Water Resources (DWR), WQCD, and EPA staff to ensure that operators of Class II injection wells comply with UIC rules and regulations to prevent contamination of underground sources of drinking water (USDWs). ECMC staff reviews UIC permits for site-specific matters, such as the occurrence of faults and the potential for induced seismic activity. Based on this analysis, UIC permits include conditions of approval (COAs) pertaining to injection pressures, daily injection rates, and volumes. Commercial and non-commercial injection operations are actively managed by ECMC in conjunction with the U.S. Geological Survey Earthquake Notification Service through the installation and continuous monitoring of local seismometers to evaluate if an injection of produced water relates to local seismicity. ECMC has instituted a “traffic light” monitoring system, which dictates specific mitigation measures and requires injection halt if seismic activity reaches particular levels. Two Class II UIC well permits were approved in 2024.

In 2024, ECMC hosted the State/Tribal/EPA Region 8 UIC Directors Meeting where programs were able to collaborate on many issues including community engagement and permitting, inspection and compliance, Class II and Class VI efforts, aquifer exemptions, primacy applications, and more. Those in attendance also took a tour of local Lyons Sandstone and Morrison Formation outcrops, hosted by Dr. Steve Sonnenberg from Colorado School of Mines.

3.2.3 Orphaned Well Program

During fiscal year (FY) 2024, the Orphaned Well Program used appropriated funds, the Orphaned Well Mitigation Enterprise Fund, a federal Infrastructure Investment and Jobs Act initial grant, and

claimed financial assurance to perform plugging and abandonment, remediation, or reclamation work at 290 orphaned oil and gas sites in 22 counties⁶:

- Plugged 132 wells
- Performed environmental remediation at 37 sites
- Performed surface reclamation at 71 sites

Reclamation work included maintenance of stormwater best management practices (BMPs), weed control, and maintenance seeding at sites that were reclaimed in prior fiscal years. Other work at sites not listed above included flowline abandonment and equipment decommissioning. ECMC expects a similar level of effort in FY 2025.

3.2.4 Compliance

The Compliance Unit includes inspectors and enforcement officers, who work closely together to gain operator compliance with ECMC Rules. Gaining compliance can come through outreach training, voluntary compliance after issuing a corrective action or warning letter, or more formal actions related to a Notice of Alleged Violation (NOAV).

3.2.5 Permitting and Planning Unit

The Permitting and Planning Unit includes the Location Assessment and Permit/Completion Groups. It is responsible for surface and subsurface permits, which an operator must obtain from ECMC before drilling a well. The Location Assessment Group primarily addresses the surface-related issues in oil and gas development plans (OGDP) or comprehensive area plans (CAP). The Permit/Completion Group primarily addresses “downhole” or subsurface issues related to OGDPs, CAPs, APDs, and a variety of other ECMC forms.

APDs are reviewed to ensure compliance with all rules related to aquifer protection. Oil and gas wells must be designed, constructed, and maintained in such a way as to prevent the migration of fluids or gas between formations or into aquifers. ECMC approved 775 APDs between January 1 and December 18, 2024.

3.2.5.1 Location Assessments

Under the OGDP and Form 2A, Oil and Gas Location Assessment process, operators must provide site-specific environmental information about surface locations. In some circumstances, ECMC, the surface owner, and the operator are required to consult with CDPHE and Colorado Division of Parks and Wildlife (CPW). Location assessment specialists (LASs, formerly called OGLAs) review and evaluate OGDP applications and publicly available information to determine whether the proposed oil and gas operations have the potential to negatively impact water resources, public health, safety, welfare, the environment, or wildlife resources. ECMC approved 112 Form 2As between January 1 and November 19, 2024.

3.2.6 Hearings Unit

The Hearings Unit is responsible for all matters related to Commission hearings. The Commission holds weekly hearings, with OGDPs/CAPs, applications for variances from rules, adjudicatory matters, and rulemakings on the agenda as needed. The Hearings Unit reviews and processes all applications for Commission orders, contested matters, rulemaking hearings, and enforcement matters and organizes public comment opportunities.

⁶ FY 2024 Orphaned Well Program work performed in the following counties: Adams, Arapahoe, Archuleta, Boulder, Broomfield, Delta, Elbert, Fremont, Jackson, Kiowa, La Plata, Larimer, Lincoln, Logan, Mesa, Moffat, Montezuma, Morgan, Rio Blanco, San Miguel, Weld, and Yuma.

3.2.6.1 Enforcement

As of December 1, 2024, the Commission had entered 38 enforcement orders, including 21 administrative orders by consent and 17 orders finding violations. These orders resolved 75 NOAVs and imposed \$41,080,389 in gross penalties, of which \$11,441,151 was conditionally suspended.

3.3 ECMC Information/Data Systems

ECMC continually works to maintain and improve its Colorado Oil & Gas Information System (COGIS) and online GIS maps. 2024 development includes:

- **Electronic Forms:** Continued implementation and enhancements to a more capable, ‘new eForms’ environment, more efficient data import, and a better user experience. Seven new forms (four related to financial assurance, two related to chemical disclosure, and one related to quarterly water reporting by location) and two existing forms (Form 8, Conservation Levy; Form 7, Monthly Operations) have been deployed to this new environment since late 2022.
- **Geographic Information Systems (GIS):** Updated map layers associated with Mission Changes Rules and introduced automation for receiving and processing GIS data attachments with electronic forms.
- **Environmental Database:** Improvements made and samples added.
- **Data Downloads:** New data sets made available.
- **Online Environmental Reports:** Updates made to some reports.

The following sections provide brief descriptions of relevant information/data systems and any development or changes implemented in 2024.

3.3.1 Electronic Forms (Webform and ‘New eForms’)

In 2022 and 2023, ECMC, in concert with the Governor’s Office of Information Technology (OIT) application development team, created a new, improved electronic form application to replace the current WebForms, currently referred to as “new eForms.” As of December 31, 2024, 11 forms have been implemented in this system, including new financial assurance Forms 3, 3A, 3B, and 3C and chemical registry Forms 46 and 46A. “New eForms” is built using a newer web-development framework that allows for more dynamic and responsive forms with user interface enhancements.

Both Webforms and “new eForms” allow operators to submit forms and attachments electronically. ECMC staff review and approve the forms digitally before data from the forms are uploaded to the master record database (MRDB). A task-centric workflow enables multiple staff members (e.g., permitting, engineering, etc.) to review and approve aspects of a form relevant to their area of expertise separately.

3.3.2 Geographic Information Systems (GIS)

The ECMC GIS Online interactive map is an essential tool used by staff, industry, and other agencies to submit and process permits, create reports, and view information related to exploration and development. The ECMC GIS Online interactive map is also a go-to resource for the general public and interested stakeholders regarding environmental concerns and siting issues related to current and planned drilling and production activity.

The ECMC GIS Online interactive map contains over 170 spatial datasets, including oil and gas well locations, permits, spacing orders, field boundaries, and valuable reference information including cities, rivers, roads, sections, land ownership, permitted water wells, and more. Aerial photos, topographic quads, and geologic maps are also included as viewable map layers. The newest version of the online mapping system allows users to zoom to a specific street address or

parcel for much of Colorado, has improved printing functionality, and includes a live connection to ECMC’s environmental sampling database. Specifically related to groundwater protection, the ECMC GIS Online interactive map includes data showing oil and gas wellbore trajectories (planned, approved, and as-drilled) and water well data from DWR. These data are used by ECMC engineers when reviewing permits and conducting offset wellbore evaluations to ensure that the casing and cementing programs for proposed wells will protect groundwater resources.

To aid operators and other interested parties with their GIS work, the ECMC website provides GIS shapefiles for download, including files with well information, permit, and pending permit data, and wellbore traces for directional and horizontal wells across Colorado, all updated daily. Recently added are downloads of KMZ files for well locations that can be used on smartphones and tablets in Google Earth.

The ECMC GIS Online interactive map is being migrated to a DNR-shared Esri platform in 2025. This new map platform will provide more functionality and better scalability in a sustainable application development environment.

3.3.3 Environmental Database

ECMC, in conjunction with the Groundwater Protection Council (GWPC), has developed a publicly available, searchable database of analytical results of groundwater, surface water, and soil sample analysis throughout the state. Referred to as the COENV database, it has been active since September 2012. The COENV database has sampling data dating back as far as 1941. As of December 10, 2024, the environmental database currently contains over 25,238 sample locations and 89,100 individual samples. In 2024, 4640 total samples were added to the database.

In May 2013, ECMC (then COGCC) enacted the Greater Wattenberg Area (GWA) Rule 318A and statewide Rules 609 and 615 and began to use an electronic data deliverable (EDD) process to transfer data from the laboratory that performed analyses to ECMC. The Form 43, Analytical Data Submittal, initially released in 2018, is used by operators to upload water quality data to the ECMC COENV database through an electronic data deliverable (EDD). The EDD process was later incorporated into and expanded in the Mission Change Rules, and the Form 43 was updated for the new requirements. Since 2013, ECMC has received 19,254 water samples from 3,730 separate locations from operators in compliance with the groundwater sampling rules through the EDD process.

The data can be easily accessed through the GIS Online interactive map. Sample locations with available water and natural gas data appear as green triangles when the “Sites with Lab Data” layer is turned on. The user can then double-click on a sample site and access the analytical data for that site.

All of the data collected by ECMC staff under the following ECMC Rules are available online:

- Rule 411.a.(2).C.ii - Baseline surface water monitoring related to surface water supply areas;
- Rule 411.b.(4).B - Reporting groundwater monitoring data related to Groundwater Under the Direct Influence of Surface Water and Type III Aquifer Wells;
- Rule 420 - Bradenhead test reporting (including gas and liquid samples collected during Bradenhead testing);
- Rule 614.b.(3) - Coalbed methane (CBM) coal outcrop and coal mine monitoring;
- Rule 615 - Groundwater baseline sampling and monitoring;
- Rule 805 - UIC analytical requirements for injection fluid analysis;
- Rule 907.b.(9) - CE&P/M facility groundwater monitoring;
- Rule 909.j - Produced water quality analysis; and

- Previous ECMC Rules 317B, 318A.f, 608, and 609 and older samples from ECMC orders and the Colorado Oil and Gas Association (COGA) Voluntary Baseline Sampling Program.

Currently, ECMC is working with GWPC to install GWPC's proprietary WaterStar software to manage analytical data received by ECMC. GWPC is partnering with ECMC on a series of updates to the existing Risk Based Data Management Solutions (RBDMS) Environmental application, which will upgrade the application to the new RBDMS WaterSTAR structure and user interface. The ECMC team is focused on improving the user experience and the type and quality of data collected for the application through these updates.

The objectives for developing the CO WaterSTAR Upgrade include:

- Improve the quality and types of data collected for display in the application and for use in agency analysis;
- Enhance the user experience through an updated user interface that makes searching and reviewing data intuitive and easy to navigate; and
- Strengthen agency analysis capabilities while reducing the time required to complete analysis efforts through updated application modules.

The WaterSTAR installation project is scheduled to be completed in the first half of 2025.

The data provided to ECMC is also available to the public through the COGIS data system on the ECMC website. Starting in April 2014, the COENV database has been available for download in an Access database format, updated monthly, for those who wish to query large datasets.

3.3.4 Data Downloads

Historically, ECMC has provided production data, spacing order data, and GIS shapefiles for download from the website. Available GIS data include well surface location and directional data (updated daily), pits, oil and gas fields, high-priority wildlife habitat, 100-year floodplain data, and approximate buffers associated with ECMC Rule 411. This has been updated to reflect the rule change to Rule 411 and the inclusion of Groundwater Under the Direct Influence of Surface Water and Type III Aquifer Wells.

In addition to GIS data (see Section 3.3.2), and to increase transparency, ECMC aggregates datasets directly from our MRDB and provides them for public use. The MRDB, managed and maintained by ECMC with assistance from the OIT, is a comprehensive repository of Colorado's oil and gas data. Although all data are available through interactive search tools on the website, these [data downloads](#) allow the industry, public, and non-governmental organizations or other interested parties to access large amounts of data in searchable formats so that they may run their own analyses. These datasets are updated at regular intervals:

- Complaints data (updated monthly)
- Daily Activity Dashboard (updated daily)
- NOAV data (updated monthly)
- Mechanical integrity test (MIT) data (updated monthly)
- Spill and release data (updated monthly)
- Analytical sample data (updated monthly)
- Field inspection reports (updated monthly)
- GIS shapefiles (updated daily)
- Annual statistics

Other available datasets are updated as needed or as data become available:

- Flowline Notice to Operators (NTO) inventory
- Production data, separated by year of production or searchable by county
- Spacing orders, updated after hearings have taken place
- Archived historical data

ECMC is developing additional data downloads for future releases.

3.3.5 Online Environmental Reports

Written reports for ECMC-managed baseline sampling projects and other special environmental studies are posted on the website under “Area Reports” in the [Library](#) tab.⁷ They are primarily organized by basin and are available for download in PDF format.

Although not new, the brochure, How Well Do You Know Your Water Well continues to be a popular and informative publication for water well owners. The brochure includes:

- Information about mitigating methane in water wells,
- Current contact information for various agencies, and
- Water well maintenance and recordkeeping guidance.

ECMC provides this brochure to water well owners when water samples are collected from their wells by ECMC, operators, or third-party contractors.

3.3.6 Daily Activity Dashboard

The [Daily Activity Dashboard](#) (DAD) is a web-based tool designed to give local governments, the public, and other stakeholders a more efficient way to access, sort, and display the most commonly used data related to oil and gas operations. The DAD is a visual, interactive tool that allows a user to generate custom statistical charts, graphs, tables, reports, and simple maps based on data that are updated daily.

The DAD does not offer the public new types of oil and gas data or replace existing ways of searching for online oil and gas data in COGIS. Instead, it provides a convenient way to access information on the following seven subject areas:

1. Pending permits,
2. Well status
3. Production
4. Well inspections
5. NOAVs,
6. Active notifications,
7. Spills

This tool can be accessed by clicking “Dashboard” in the main menu of the ECMC homepage, as shown in Figure 3-2. The DAD continues to be a popular page on the website.

⁷ The ECMC “Library” also includes cumulative impacts reports, archived presentations, technical white papers, and legislatively mandated studies, such as the 2024 report on the regulation of geothermal resources in Colorado.

Figure 3-2. Daily Activity Dashboard

Daily Activity Dashboard (DAD)

The ECMC website has been designed for transparency and acts as an important gateway to the ECMC's well, facility, and production information. The existing web-based query tools, while allowing searches on a wide variety of criteria, are less ideal for the quick evaluation, display, and presentation of dynamic data.

To address this, the agency has developed the Daily Activity Dashboard (DAD) to facilitate access to frequently requested oil and gas data at the county and state levels.

A visual, interactive tool, the dashboard allows anyone to generate custom statistical charts, graphs, tables, and simple maps in near real-time. Further, because the information found in many of the tables has been linked to associated COGIS data (e.g. scout cards), users can easily drill down further. The dashboard does not replace the existing web-based data search tools (e.g. COGIS or eForms). It can, however, provide a more efficient pathway for reaching frequently used or requested data.

Data sets currently available include:

- (1) Pending Permits
- (2) Well Status
- (3) Production
- (4) Well Inspections
- (5) NOAVs
- (6) Active Notifications
- (7) Spills

Exporting of data for the Daily Activity Dashboard is currently unavailable. We are working to restore this functionality as quickly as possible.

In the mean time a full download of the data used by the DAD can be found here: [DAD Export](#)

FIRST, [click HERE](#) to read the 'Daily Activity Dashboard: Getting Started' document

[Click HERE to access the Daily Activity Dashboard](#)

As you explore this new tool, please let us know if you have any questions or suggestions for additional parameters or displays. We hope the application, while not fully realized yet, will become a valuable resource for you.

Help

- [Daily Activity Dashboard: Getting Started](#)

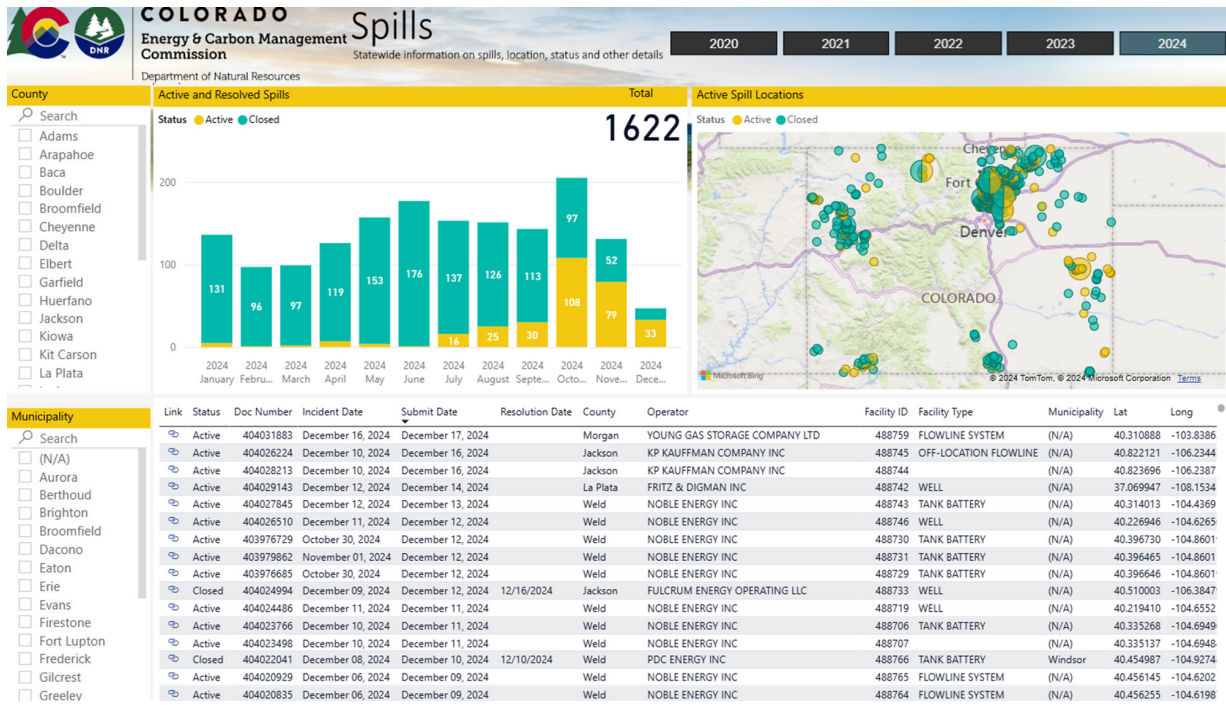
Related Links

- [Export of Data](#)

As spill/release data are of particular interest to stakeholders, the DAD provides spill data from 2019 forward, and the current numbers of spills reported by year. Spills may be searched by county or municipality. The DAD also provides a map with spill locations and links to the spill reports; Figure 3-3 is an example screenshot of this display. ECMC has developed [a tutorial document with methods for searching spills/release and remediation data](#), with the foremost recommended method being the DAD.



Figure 3-3. Daily Activity Dashboard Screenshot (Spills)



3.4 ECMC Environmental Program and Project Funding

The General Assembly annually appropriates a line item within ECMC’s budget for the environmental staff to respond to, investigate, prevent, monitor, or mitigate conditions that threaten or cause adverse impacts to air, water, soil, public health, safety, and welfare, or wildlife resources. This work includes but is not limited to: the collection of water and soil samples, laboratory analyses of the samples, and review and analysis of laboratory results and other environmental data. For FY 2024-25, the appropriation for this line item remained at \$312,033.

In addition, the General Assembly annually appropriates a line item to fund special environmental protection and mitigation studies including, but not limited to: gas seepage mitigation studies, outcrop monitoring studies, soil gas surveys in the vicinity of plugged orphaned wells, and baseline water quality and subsequent follow-up studies. The intent is to provide readily available funds for special projects as needed. In its annual budget request, ECMC reports all expenditures made from this line item in the previous year to the General Assembly. The total appropriation for this line item in FYr 2024-25 remained at \$325,000.

In addition to the preceding, ECMC receives an annual appropriation to respond to oil and gas operation emergencies that threaten or cause significant adverse impacts to public health, safety, welfare, or the environment. For FY 2024-25, this appropriation is \$150,000, consistent with prior year appropriations. The ECMC also receives an annual appropriation to plug wells, abandon flowlines, decommission production equipment, perform environmental sampling and remediation, and reclaim surfaces. The FY 2024-25 appropriation for the budget line item is \$9.5 million.



Section 4: Regulatory and Legislative Updates

4.1 Senate Bill 19-181 (SB19-181)

On April 16, 2019, Governor Polis signed [SB19-181](#), “Protect Public Welfare Oil and Gas Operations” into law. This legislation amended the Oil and Gas Conservation Act and required several changes to the overall regulatory framework of ECMC (at the time COGCC). Changes included the appointment of a professional commission by the Governor, increased local government control over the siting of oil and gas locations, an overhaul of the oil and gas location assessment review process, and changing of the agency mission to “regulate the development and production of the natural resources of oil and gas in the state of Colorado in a manner that protects public health, safety, welfare, the environment, and wildlife resources.” As a result of this mission change, the Commission undertook required rulemakings for wellbore integrity, flowlines, practice and procedure, alternative location analysis, cumulative impacts, financial assurance, and bringing its existing rules into compliance with its new mission. Of rulemakings required by SB19-181, only worker certification rules remain pending as of December 31, 2024.

Information on all prior and any pending rulemaking including draft rules, copies of public comments, and recordings of Commission rulemaking hearings may be found on [ECMC’s website in “Rulemakings” under “Hearings.”](#)

4.2 Emerging Energy Technologies (SB23-285)

On May 22, 2023, Governor Polis signed SB23-285, “Energy & Carbon Management In Colorado,” into law. The bill renamed COGCC to ECMC and expanded the agency’s regulatory authority over several emerging energy technologies, including deep geothermal, underground natural gas storage, and carbon and storage. Prior to this legislation, there was regulatory uncertainty due to a lack of oversight of these new and emerging energy technologies. ECMC’s resources and expertise in subsurface technologies, rulemaking, and working with communities made the former COGCC the trusted agency to undertake this important regulatory role.

The following subsections describe several emerging technologies that ECMC identified in early 2023 as appropriate for consideration for ECMC oversight and describe their current status.

Note: Further information, including links, for all studies and reports indicated as completed in the following sections may be found in Table 4-1 of Section 4.6.

4.2.1 UIC Class VI Program

In 2021, Senate Bill 21-264 tasked ECMC with preparing a report to evaluate the resources needed for Colorado to implement a safe and effective regulatory program for Class VI UIC wells, which are used exclusively for carbon sequestration. Concurrently, the Colorado Energy Office established a task force to explore how carbon capture, use, and sequestration (CCUS) could be appropriately enabled, deployed, and regulated in the state. Following the release of [ECMC’s Class VI report](#) and the CCUS Task Force’s recommendations, Governor Polis directed ECMC to develop a [legislative proposal](#) that addressed the legal changes necessary to create a comprehensive regulatory framework for Class VI UIC wells and support carbon sequestration opportunities in Colorado.

On May 22, 2023, Governor Polis signed Senate Bill 23-016 (SB23-016) into law, granting ECMC the authority to pursue regulatory primacy for Class VI UIC wells, which are currently regulated by

EPA under the Safe Drinking Water Act. To achieve primacy, ECMC must adopt rules that are “no less stringent than the national primary drinking water regulations” and submit a comprehensive application to the EPA.

SB23-016 empowered ECMC to issue and enforce permits for Class VI UIC wells after obtaining primacy, required analysis of the cumulative impacts of any proposed Class VI project, and provided special protections for disproportionately impacted communities. It also imposed requirements for financial assurance, local government siting approval, and surface owner consent, among other measures.

In 2024, Governor Polis signed House Bill 24-1346, which expanded ECMC’s authority by clarifying its jurisdiction over geologic storage operations. The law confirmed that geologic storage resources (the underground pore space used for carbon dioxide sequestration) are owned by surface owners and established a mechanism for forming geologic storage units.

Between 2021 and 2024, ECMC produced three reports examining technical and legal considerations for CCUS. These findings were instrumental in shaping Colorado’s Class VI UIC rules.

The Class VI UIC rulemaking hearings were held from December 2 to December 16, 2024. On December 16, 2024, the Commission adopted rules for Class VI UIC wells, marking a significant step toward achieving regulatory primacy. The new rules will become effective once the EPA approves Colorado’s primacy application.

Colorado is expected to submit its primacy application in Spring 2025. The EPA is anticipated to take approximately one year to review the application, with a decision expected in 2026.

4.2.2 Geothermal Energy

Geothermal energy production involves wells or loops that cycle fluids to transfer subterranean heat to the surface for use in direct heating applications or energy production. Shallow geothermal wells have been used for direct heating for decades and are administered by DWR, which had jurisdiction over all geothermal wells in Colorado until the passage of SB23-285. Among other things, SB23-285 split geothermal wells and resources into two classifications: shallow and deep. DWR continues to have regulatory authority over shallow geothermal wells.

Deep geothermal resources have been defined by statute as being non-tributary to water rights in nature and deeper than 2500 ft. Deep geothermal wells have the potential to generate significant amounts of energy by using either new or existing vertical or horizontal wells drilled with technologies similar to those used in oil and gas development.

To encourage geothermal operations and clarify regulatory processes, the General Assembly directed ECMC to compile a geothermal resource assessment and a geothermal regulatory study. The resource assessment was completed in collaboration with the Colorado Geological Survey (CGS) and was released in July of 2024. The resource assessment report reviews the geothermal resources in the state based on existing data compiled by the CGS and identifies what technologies may be applicable across the state, including the repurposing of oil and gas wells, as well as a review of the potential impacts of these operations. In collaboration with DWR, ECMC released a geothermal regulatory study in December of 2024. The regulatory study includes recommendations to streamline the geothermal regulatory process and encourage safe and effective operations in Colorado. These recommendations are being considered by the General Assembly in the 2025 legislative session.

ECMC’s 1300-Series Deep Geothermal Rules were approved at hearing on August 12, 2024, and took effect on September 30, 2024. Staff has developed business process flow and is developing the necessary electronic forms for administration of the program.

Currently, one deep geothermal science well is in the process of being permitted under Standing Order 1-326, which governs science well permitting in the absence of approved agency rules. The Form 2A, Location Assessment was approved on September 12, 2024. Two APDs intended for the location have not yet been submitted.

4.2.3 Natural Gas Storage

Oil and gas midstream and distribution companies temporarily store natural gas in subsurface geologic formations to provide dispatchable gas to generate power as market demand dictates. ECMC has state jurisdiction over the gas storage well permitting and construction but does not regulate the operations of the wells or gas storage fields; currently, those facilities are regulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA). ECMC plans to seek an agreement with PHMSA to regulate the intrastate gas storage facilities in Colorado and will consider if it is necessary to establish regulations for facilities that inject and store non-hydrocarbon gasses. Centralizing regulation of gas storage activities may provide a more protective regulatory environment and support innovation and economic investment. ECMC was directed to create draft rules around natural gas storage as one step towards gaining primacy.

4.2.5 Hydrogen

The hydrogen industry involves the production, transport, storage, and distribution of hydrogen gas; it includes subsurface operations such as wells, underground storage facilities, and pipelines and surface operations such as tank storage, truck transport, and distribution facilities. Production, transportation, and storage are crucial considerations for the success of the hydrogen industry. Clarifying the regulatory process for these components will increase operational certainty, and provide a consistent approach to protective permitting and oversight. Developing a regulatory structure for the hydrogen industry is consistent with both the Colorado Energy Office's [Opportunities for Low-Carbon Hydrogen in Colorado: A Roadmap](#) and the State's [Greenhouse Gas Pollution Reduction Roadmap](#).⁸ ECMC was directed to conduct a study and make recommendations about permitting and management of hydrogen infrastructure and operations. The study was released in July of 2024 and includes considerations and recommendations related to hydrogen production, storage, and transport.

4.3 Oversight of Chemicals Used in Oil & Gas (HB22-1348)

Since 2013, oil and gas operators have been required to report their chemical usage to FracFocus, an independent third-party data repository created in partnership with the GWPC. However, environmental groups were concerned that transparency in data reported to FracFocus was significantly curtailed by the industry's reliance upon trade secret protection. Stakeholders were also concerned that reporting to FracFocus did not put information directly into the hands of the members of the public most proximal to oil and gas activities.

In response to those concerns, the Colorado Assembly passed HB22-1348, Oversight of Chemicals Used in Oil & Gas. The act established a regulatory scheme requiring the disclosure of certain chemical information for products used in downhole oil and gas operations regardless of if the product was considered a trade secret or proprietary. ECMC was required to create a new disclosure process, utilize or develop a chemical disclosure website to collect, and share this chemical disclosure information with the public.

On and after July 31, 2023, operators, service providers, and direct vendors that provide chemical products directly to an operator or service provider at a well site (disclosure) for use

⁸ *Colorado Greenhouse Gas Pollution Reduction Roadmap 2.0*, linked in the text, was released in February of 2024 and includes an updated inventory of emissions and new near term actions for the State to follow through 2026. A copy of the original "Roadmap" released in January 2021 may be read at the following link: https://drive.google.com/file/d/1jzLvFcrDryhhs9ZkT_UXkQM_0LiiYZfq/view

in underground oil and gas operations (downhole operations) in the state must disclose to the commission:

- The trade name of the chemical product; and
- A list of the names of each chemical used in the chemical product.

The discloser must also provide the commission with a declaration that the chemical product contains no intentionally added perfluoroalkyl or polyfluoroalkyl chemicals.

In April 2024, eForms for the Form 46, Chemical Product Registration and Form 46A, Chemical Product Use were released. Information collected by these forms is posted publicly at the [ECMC Chemical Disclosures site](#).

4.4 Water Conservation in Oil and Gas Operations (HB23-1242)

HB23-1242 requires operators, every month, with respect to wells, and quarterly, with respect to oil and gas locations, to report information to ECMC regarding the operator's use of fresh water, recycling, and reuse of produced water, and disposal of produced water. The overarching goal of the legislation is a statewide reduction in the usage of fresh water and a corresponding increase in the use of recycled or reused water in oil and gas operations. To this end, ECMC is required to adopt new rules; hearings for the produced water rulemaking are scheduled to begin on January 30, 2025.

The act also created the CPWC within DNR, which has been meeting since September 2023. The CPWC will make recommendations to state agencies and the general assembly regarding the recycling and reuse of produced water, develop guidance documents to promote best practices for in-field recycling and reuse of produced water, and analyze and report on:

- Existing produced water infrastructure, storage, and treatment facilities;
- The volume of produced water in different oil and gas basins available for recycling and reuse; and
- Additional infrastructure, storage, and technology needed to achieve different levels of recycling and reuse of produced water throughout the state.

To date, the CPWC has submitted the following reports⁹ to the General Assembly:

- Initial Guidance Documents and Case Studies to Promote Best Practices for In-field Recycling and Reuse of Produced Water Report (submitted March 1, 2024)
- Initial Produced Water Regulatory Policy Coordination Report (submitted May 1, 2024)
- Current State of Produced Water Infrastructure, Storage, and Treatment Facilities Across the State with Emphasis on the Denver-Julesburg Basin Report (submitted July 1, 2024)
- Initial Availability of Produced Water for Reuse and Recycling Analysis Report (submitted August 1, 2024)
- Strategic Priorities on Topics Related to Produced Water (submitted August 16, 2024)
- Initial Report on Infrastructure, Storage, and Treatment Facilities Necessary to Achieve Different Levels of Recycling & Reuse of Produced Water (submitted August 30, 2024)
- Identifying Barriers to the Safe Recycling and Reuse of Produced Water Report (submitted October 30, 2024)
- Produced Water Reuse and Recycling Goals and Contemporaneous Decreases in Fresh Water Use Report (submitted December 2, 2024)

⁹ All reports can be found at CPWC's website: <https://dnr.colorado.gov/colorado-produced-water-consortium>

In September of 2024, the CPWC made recommendations regarding the upcoming ECMC rulemaking regarding produced water.¹⁰ The recommendations included a graduated schedule that will significantly increase the amount of recycled or reused produced water and decrease the amount of fresh water utilized by oil and gas operations across the state:

- Any application for new oil and gas development, including any Comprehensive Area Plan, filed with ECMC after January 1, 2026 must plan to use a minimum of 4% recycled or reused produced water, or its equivalent, for operations to include completions proposed by the application.
- Any application for new oil and gas development, including any Comprehensive Area Plan, filed with ECMC after January 1, 2030 must plan to use a minimum of 10% recycled or reused produced water, or its equivalent, for operations to include completions proposed by the application.
- Any application for new oil and gas development, including any Comprehensive Area Plan, filed with ECMC after January 1, 2034 must plan to use a minimum of 20% recycled or reused produced water, or its equivalent, for operations to include completions proposed by the application.
- Any application for new oil and gas development, including any Comprehensive Area Plan, filed with ECMC after January 1, 2038 must plan to use a minimum of 35% recycled or reused produced water, or its equivalent, for operations to include completions proposed by the application.

ECMC has worked with OIT to develop the forms and processes necessary to collect the monthly (Form 7W, Monthly Report of Operations¹¹) and quarterly data (Form 47, Quarterly Water Reporting by Location) as required, and has been receiving Produced Water data since September 2023. As of December 10, 2024, operators have provided 190 Form 47s, which in total reported data for 11,062 oil and gas locations. Operators provided 1388 Form 7Ws which included information for 33,487 oil and gas wells in 2024.

HB23-1242 authorized two new FTEs in the Environmental Data Group in the Environmental Unit to support the CPWC and analyze produced water data collected through the Form 7W and Form 47, both of which were hired in 2024.

4.5 Oil And Gas Commission Study Methane Seepage Raton Basin (SB23-186)

SB23-186 requires ECMC (then COGCC) and WQCD, in consultation with local governments, to perform a study that:

- Identifies best management practices for capturing methane seepage in the Raton basin;
- Evaluates the quality of water resulting from such methane capture operations; and
- Evaluates the potential to preserve and make beneficial use of such water.

The primary objectives of the study are to:

- Proactively and systematically locate and survey methane gas seepage in the Raton basin;
- Document previous areas of seepage;
- Calculate any differences in seepage amounts; and
- Assess the potential for methane to create hazardous conditions.

¹⁰ These recommendations are available online from the CPWC's website: https://drive.google.com/file/d/1m1Nm2whscmWJBb_Nz0ofYr-QA2ItW5IY/view

¹¹ The "Form 7W" is a tab that was added to the existing Form 7, which provides the fields necessary to collect data on use of fresh and recycled/reused water and the disposition or disposal of produced water.

ECMC procured contractors to perform aerial surveys to identify and locate natural methane seepage in the Raton Basin and to perform ground based mapping and methane flux measurements in order to determine seepage amounts in the basin. The contractor completed the aerial surveys and flux measurements in June through August 2024. The contractor is currently compiling the data and preparing a final report for ECMC that includes, maps of the identified seep locations, methane flux measurements, and a methane hazard assessment with potential recommendations for hazard mitigation.

ECMC is working with WQCD to complete an evaluation of the potential to use CBM-produced water beneficially. ECMC hired contractors to collect CBM-produced water samples, and hired a contractor to aid in the CBM-produced water data evaluation. ECMC’s contractor completed the sample collection of CBM-produced water in October and November 2024. ECMC and its contractor will evaluate the data collected as part of this study, along with CBM-produced water data submitted by operators as required by Rule 909.j, and data from previous Raton Basin water quality studies. ECMC anticipates completing the data evaluation this winter in partnership with WQCD for presentation in a final report to the Agriculture, Water and Natural Resources Committee of the House of Representatives and the Agriculture and Natural Resources Committee of the Senate prior to June 30, 2025.

4.6 Studies

As mentioned in the subsections above, ECMC was directed by the legislature to undertake several studies in 2024. These studies are summarized in Table 4-1.

Table 4-1. ECMC 2024 Studies

Study Topic	Bill	Submitted Date	Description
<u>Carbon Capture and Storage Safety Study</u>	SB23-016	Feb. 1, 2024	Evaluate safety of CCS operations, including potential releases from wells, pipelines, or the storage facility; evaluate safety measures, environmental impacts, and potential regulations
<u>Biochar (with CSU)</u>	HB23-1069	June 1, 2024	Colorado State University and working group evaluate use of biochar in plugging of oil and gas wells to determine whether it would provide net removal of atmospheric carbon and whether use would require changes to state law or regulations
<u>Geothermal Technical</u>	SB23-285	July 1, 2024	Economic analysis and evaluation of geothermal resources in Colorado, use of existing infrastructure, emerging technologies, and potential impacts and mitigation measures. This report includes the release of a large dataset used to generate the maps and analyses within the report.
<u>Hydrogen</u>	SB23-285	July 1, 2024	Study and develop recommendations concerning regulation and permitting of underground storage, pipeline transportation and other hydrogen operations. The report includes considerations to clarify regulatory authority and process to support the nascent hydrogen industry.

<u>Subsurface Injection</u>	SB23 -016	Dec. 1, 2024	Evaluation of whether Colorado should seek primacy for all classes of underground injection wells, including recommendations for regulatory structure and jurisdictional concerns. The report identified relevant state agencies and detailed future considerations related to pursuing primacy.
<u>Pipeline Safety and Siting</u>	SB23-285	Dec. 1, 2024	Evaluate administrative structure for siting and regulating intrastate pipelines, including analysis of potential jurisdictional gaps, safety concerns, and strategies. Completed in collaboration with PUC, the report identifies considerations to increase safety, education, and other pipeline related items in the state.
<u>Geothermal Regulatory</u>	SB23-285	Dec. 31, 2024	Evaluate existing State regulatory structure and whether changes to law or regulations are necessary. Completed in collaboration with DWR, the study includes recommendations to streamline the regulatory process while providing appropriate protections for safe and effective operations.
Raton Basin	SB23-186	June 30, 2025	Identify potential dangers of methane seepage and best management practices for capture in Raton Basin, and evaluate water quality and potentially beneficial use of water from CBM wells.





Section 5: Oil and Gas Exploration and Production Activity

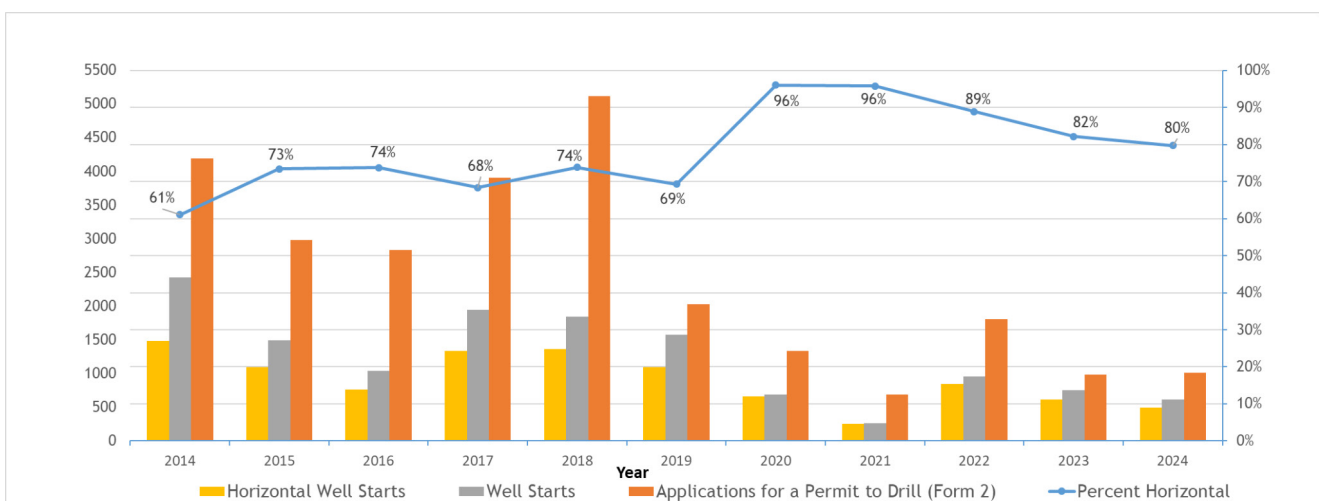
The following sections describe statewide oil and gas activity. Data presented are current through December 2024 unless otherwise noted. However, monthly oil and gas production reporting must be submitted 45 days following the end of the month; ECMC staff then process the production reports, resulting in a delay of 60 to 90 days before production is finalized. Therefore, annual production data provided in this report are estimates, with final annual production typically available on the ECMC website by April of the following year.

5.1 Drilling Permits and Rig Activity

Through December 18, ECMC approved 1010 APDs. The majority (63%) of the approved well permits were located in Weld County followed by Rio Blanco County (6%).

Another metric to gauge activity level is the number of wells drilled; ECMC tracks all well starts, including conventional and horizontal well starts. As of December 18, 2024, there were 617 well starts statewide, compared to 752 in 2023, 956 in 2022, 263 in 2021, 688 in 2020, and 1578 in 2019. In 2024, 492 of the well starts, or approximately 80% of the total well starts in the state, were for horizontal wells. As in recent years, horizontal drilling associated in the Niobrara and Codell Formations in the Denver-Julesburg (DJ) Basin continues to dominate drilling activity. Over the past decade, horizontal wells, already the majority of wells drilled yearly in Colorado, have become even more prevalent. This trend is illustrated in Figure 5-1.

Figure 5-1. Annual Permit and Well Start Activity 2014 - 2024

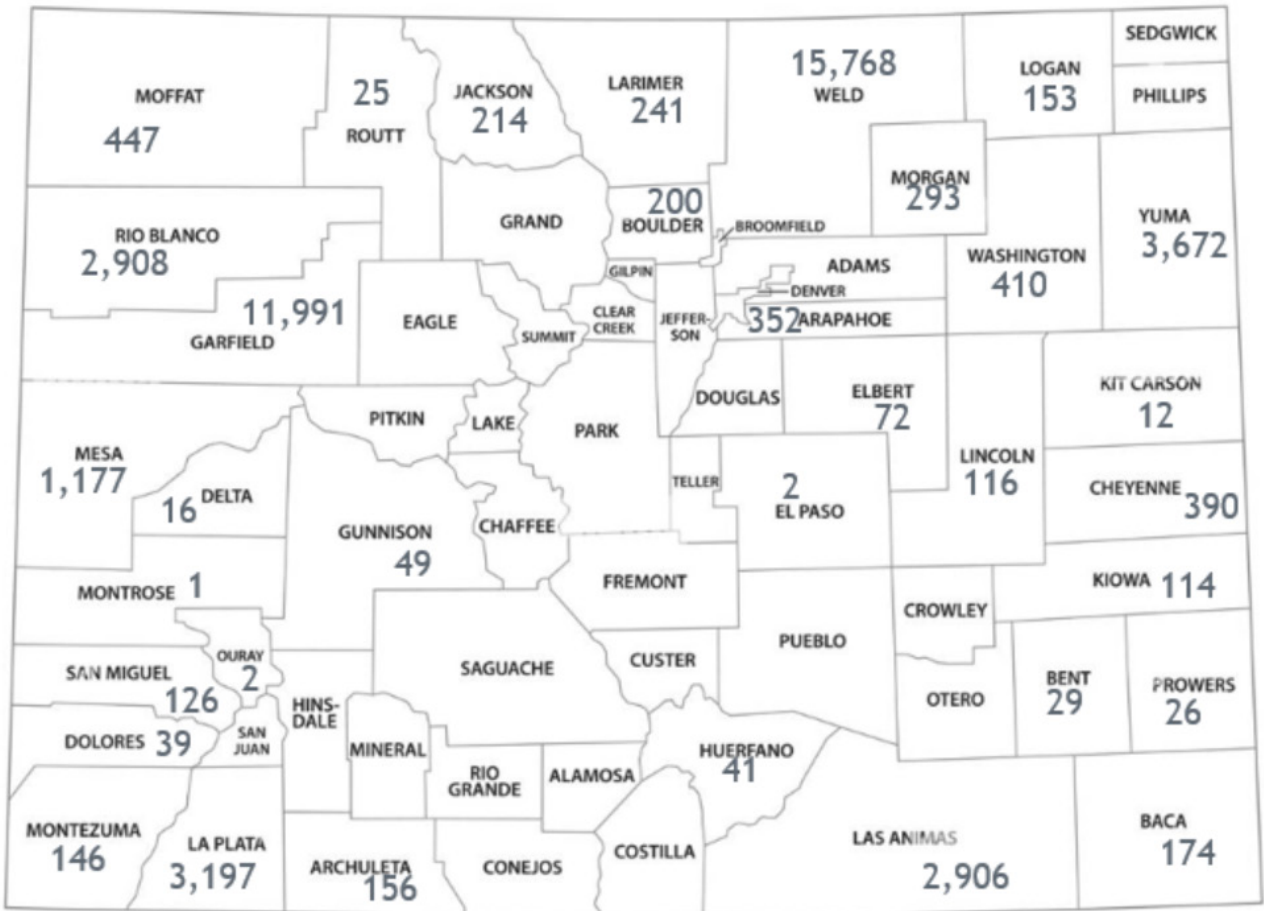


The 2024 average active rig count for Colorado stood at 14 through early November, with 8 of those rigs drilling in Weld County. By comparison, the average active rig count for 2020 was 9; 2021 was 10; and 2022 and 2023 were 17. Assuming prices remain stable, the expectation is for rig activity to remain about the same in 2025.¹²

As of December 18, there were 46,869 active wells in the state. Figure 5-2 shows the number of active wells by county. As of December 18, Weld and Garfield counties have the most active wells, with 15,768 and 11,991 wells respectively, followed by Yuma County with 3672 and La Plata County with 3197 wells.

¹² Leeds School of Business. Sixtieth Annual Colorado Business Economic Outlook (2025). 9 December 2024. <https://www.colorado.edu/business/media/18196>

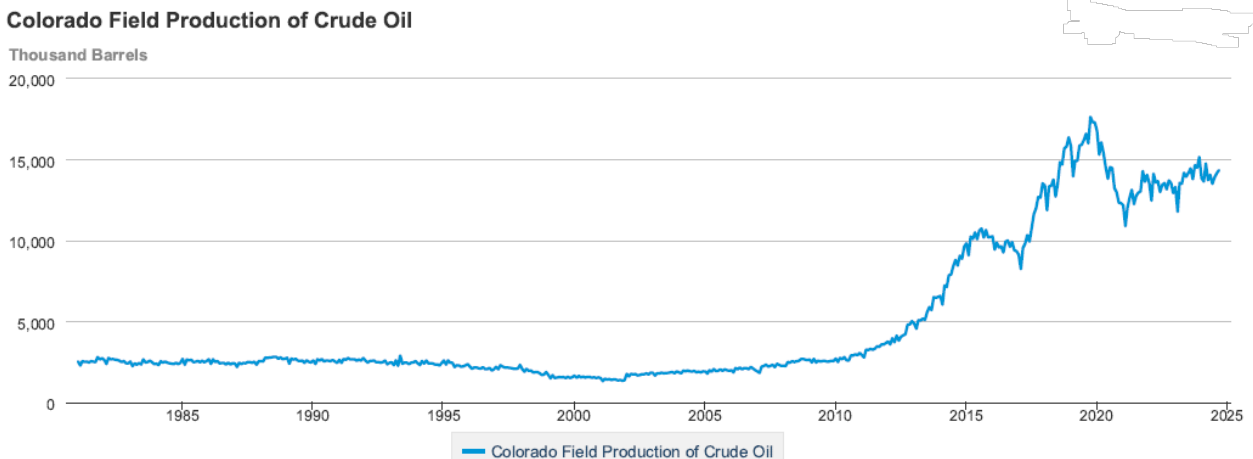
Figure 5-2. Number of Active Wells in 2024 by County



5.2 Oil Production

ECMC estimates that statewide oil production for 2024 was approximately 163.1 million barrels (MMbbls) of oil produced. As shown in Figure 5-3, the production high (all-time) of nearly 193 MMbbls was in 2019. According to the U.S. Energy Information Administration (EIA), Colorado accounts for approximately 4% of the total crude oil produced in the United States. It ranks 4th among states in production as of August 2023.

Figure 5-3. Colorado Field Production of Crude Oil



While the rapid growth in production rates reflects the increase in horizontal well development, these horizontal wells experience rapid production declines (estimated to be from 30% to greater than 50%) in the first year of production. From 2011 through 2019, production decline rates were offset by new drilling; however, the decrease in new well drilling starting in 2020 and continuing through 2022 is reflected in the drop in cumulative production after 2019. In the longer term, estimates indicate the Niobrara Formation may contain as much as 2 billion barrels of oil, with the DJ Basin being the 5th largest liquid resource in the U.S. based on proven reserves.

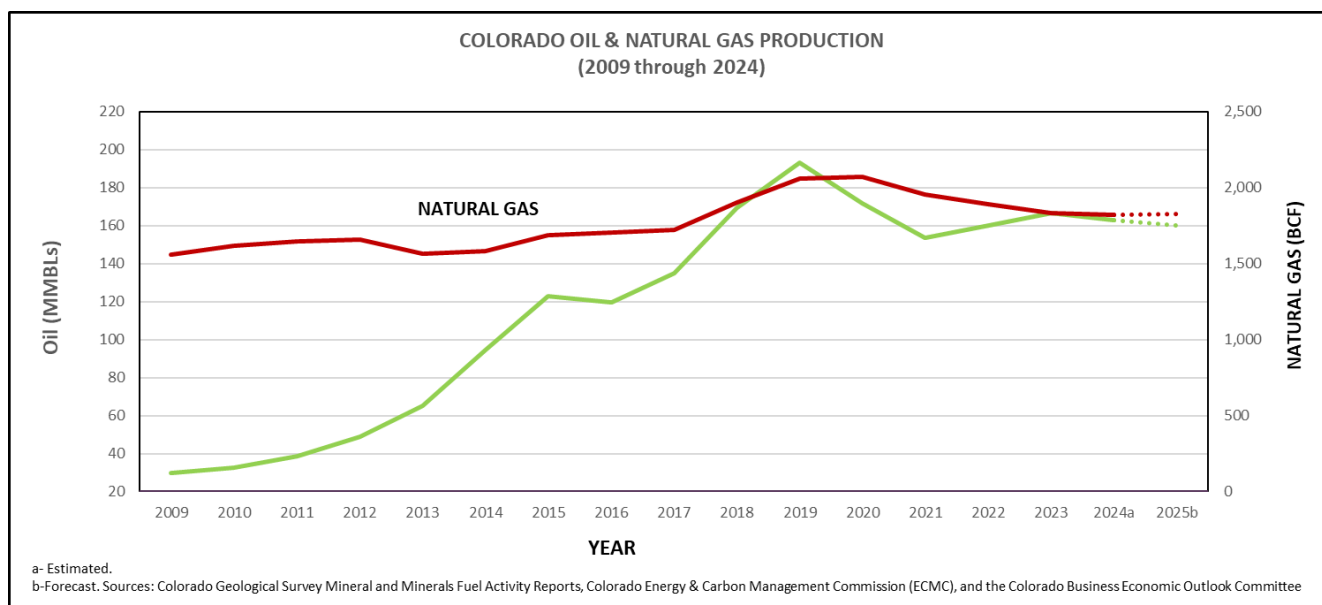
5.3 Natural Gas Production

Since 2023, Colorado ranks 8th in the nation for marketed natural gas production. The International Energy Agency (IEA) estimates that conventional and unconventional output from Colorado basins accounts for 4.5% of the total annual U.S. natural gas production. The state contains 11 of the largest natural gas fields in the country, leads the nation in gross withdrawals from CBM wells, and contains almost a quarter of the economically recoverable coalbed methane in the country.¹³

ECMC estimates that approximately 1.82 trillion cubic feet (tcf) of natural gas were produced in Colorado in 2024. This volume is on track to be slightly less than the production in 2023, down from the all-time highest production record of 2.07 tcf in 2020.

Since 2009, Colorado’s oil production has increased from 30 million barrels of oil to the current levels of 163 million barrels of oil. Natural gas production has remained relatively flat (Figure 5-4).

Figure 5-4. Colorado Oil and Gas Production 2009 - 2024



5.4 Economic Value

ECMC estimates the total dollar value for combined oil and natural gas produced in Colorado in 2024 to be approximately \$14.9 billion - 6.5% lower than in 2023. In this estimate, ECMC used \$67 per bbl for oil and \$2.37 MCF for natural gas. This decrease in production value results from the modest decrease in physical output and muted prices.¹⁴ The combined production value was \$16 billion in 2023, \$25.6 billion in 2022, \$15.7 billion in 2021, \$9.4 billion in 2020, \$15.3 billion in 2019, \$16.3 billion in 2018 and \$11.4 billion in 2017.

¹³ Ibid.

¹⁴ Ibid.

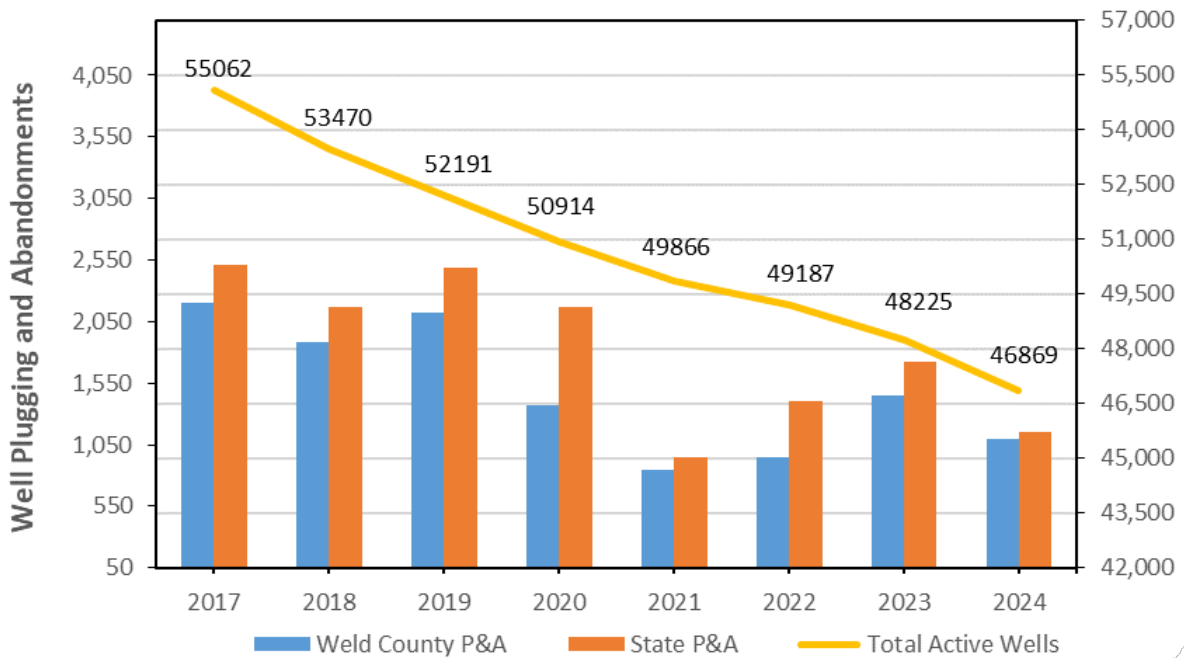
5.5 Total State Well Count vs Well Plugging and Abandonment

Approximately 1151 wells were plugged and abandoned (P&A) statewide in 2024, bringing the state active well count down to 46,869, a significant decrease from the all-time high active well count of 55,062 in 2017. Since 2017, approximately 14,551 wells have been P&A state-wide.

Weld County continues to lead the state in well P&A activities, with approximately 1098 wells plugged in 2024, slightly lower than the 1450 wells plugged in 2023. The ongoing horizontal development in the GWA Field (primarily in Weld County) has resulted in many older conventional wells being plugged.

Figure 5-5 shows the overall decline in total active well count each year since 2017, with bars representing the number of wells plugged annually statewide and in Weld County.

Figure 5-5. Well Plugging and Abandonment and Total Active Wells 2017 - 2024





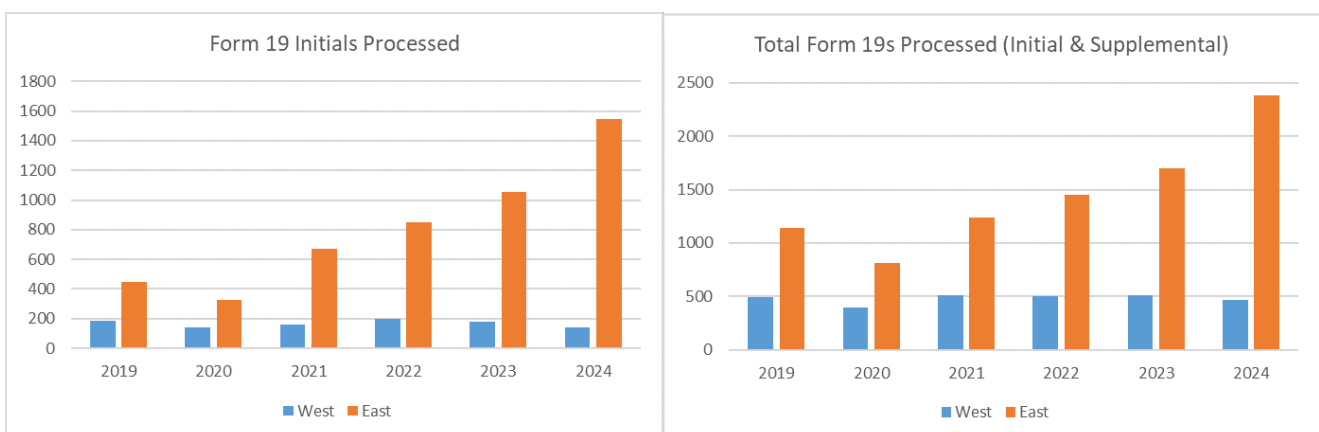
Section 6: Statewide Spills/Releases, Remediation Projects, and Environmental Investigations

Operators are required to report spills and releases of E&P waste and produced fluids that occur as a result of oil and gas operations in accordance with ECMC Rule 912 using a Form 19, Spill/Release Report. Reporting is required for all types of produced fluids and E&P waste, although oil, condensate, and produced water are the most commonly spilled or released substances. These substances fall under the E&P waste exemption to regulation as hazardous wastes under Subtitle C of the Resource Conservation and Recovery Act (RCRA); therefore, they are subject to ECMC jurisdiction. ECMC defines spills as “any unauthorized sudden discharge of E&P waste to the environment” and releases as “any unauthorized discharge of E&P waste to the environment over time.” From a practical standpoint, spills are incidents found while or shortly after they occur, and releases are found long after they occur and include historical impacts associated with past oil and gas operations that may be discovered during facility decommissioning.

Through December 31, 2024, a total of 1739 spills/releases were discovered and reported to ECMC for the calendar year. In comparison, there were 1189 spills in 2023, 1050 spills in 2022, 851 spills in 2021, 476 spills in 2020, and 639 spills reported in 2019. There are two primary reasons for the significant increase in reported spills observed in 2021 and 2022. First, the Mission Change Rules (as required by SB19-181) went into effect on January 15, 2021; as updated, Rule 912 included several new reporting thresholds for spills. Second, as amended, Rule 911 required operators to submit Form 27, Site Investigation and Remediation Workplans to document the closure of all facilities when wells are plugged and related production facilities (including flowlines) are decommissioned. In the past, there was no formal requirement for closure documentation except for pits and partially buried vessels. During these closure events, operators are now documenting historical releases through the Form 19 and then closing them through their site investigation and remediation process.

The number of Initial Form 19s (indicating new spills or releases) has risen sharply in the eastern half of the state where most P&A activity is occurring. A direct result of better environmental oversight during P&A and facility decommissioning activities is an increase in reported spills and releases. Figure 6-1 shows the number of all Form 19s processed in the past six years.

Figure 6-1. 2019 - 2024 Spill Reporting



Per the MOA for Response to Spills/Releases to Surface Water, ECMC notifies WQCD of spills or releases impacting surface waters. Additionally, Rule 912.b.(9) requires operators to report a spill or release of any size that impacts or threatens to impact surface water to the CDPHE spill reporting hotline. Through December 31, 2024, one spill or release to surface waters was reported to WQCD staff. ECMC and WQCD staff coordinate the follow-up and oversight of these spill cleanups, including enforcement for any rule violations that led to or resulted from the spill or release.

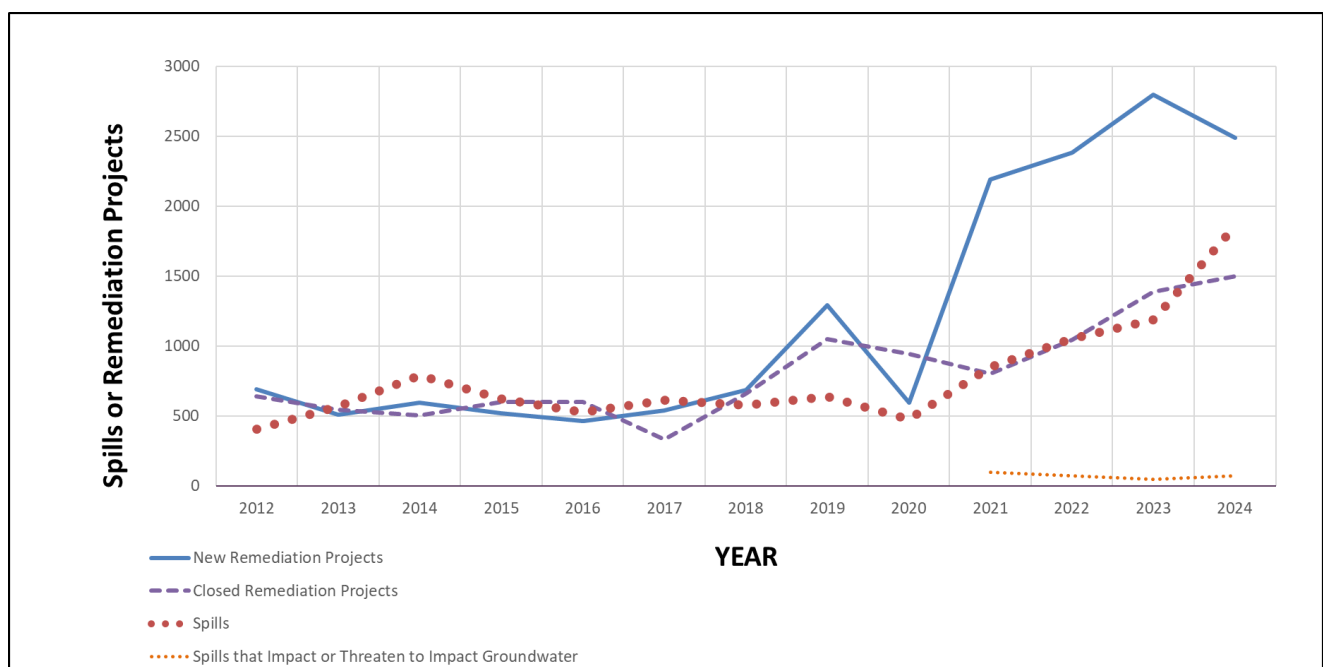
Through December 31, 2024, 70 spills or releases were reported that either impacted or threatened to impact groundwater, all located in the eastern portion of the state. Of those 70 spills or releases, 41 were historical releases and 29 spills were recent spills.

Where groundwater has been threatened or impacted, operators are required to:

- Immediately eliminate any ongoing spill,
- Investigate the extent of contamination,
- Remove the source of contamination (such as impacted soils in contact with groundwater or liquid phase hydrocarbon product),
- Establish points of compliance,
- Remediate to the extent practicable, and
- Monitor any remaining contaminant levels until contaminants of concern comply with Table 915-1 Standards¹⁵ and Regulation 41 Groundwater Quality Standards.

In 2024, 1855 spills and releases were closed. Spills and releases are considered “closed” when soils and groundwater have been demonstrated to meet the cleanup criteria of Table 915-1 or when the operator requests to continue their site investigation and remediation under an approved work plan. Spills and releases that impact groundwater are closed through the latter process due to the duration of the remediation projects and as required by rule. Operators must demonstrate that each site complies with analytes listed in Table 915-1. Figure 6-2 shows the number of spills and remediation projects from 2012 through 2024. A significant increase in new remediation projects was observed after SB19-181 took effect on January 15, 2021, due to the rule changes.

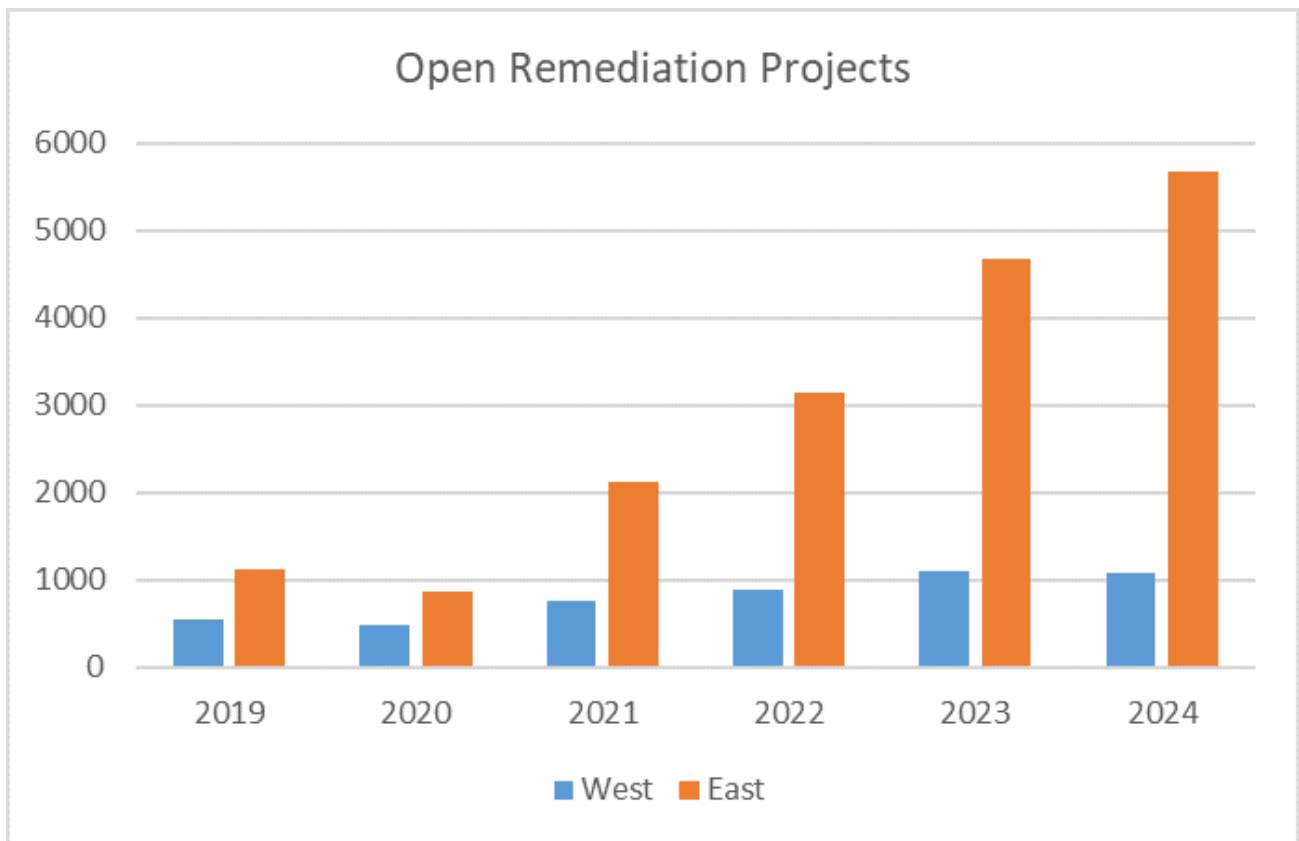
Figure 6-2. Spills and Remediation Projects (2012 through 2024)



15 See ECMC Rule 915.

Remediation projects are tracked in ECMC’s database and can be accessed on the ECMC website. In 2024, ECMC received 2486 new remediation plans and closed 1500 remediation projects. Figure 6-3 shows the number of active remediation projects in the east and west halves of the state, respectively. These charts show a dramatic increase in active remediation projects in the eastern half of the state, reflecting the significant P&A activity, including facility decommissioning, in the DJ Basin and a more minor but still significant increase in active remediation projects on the western slope. In all, ECMC staff processed over 10,745 Form 27s in 2024.

Figure 6-3. Open Remediation Projects



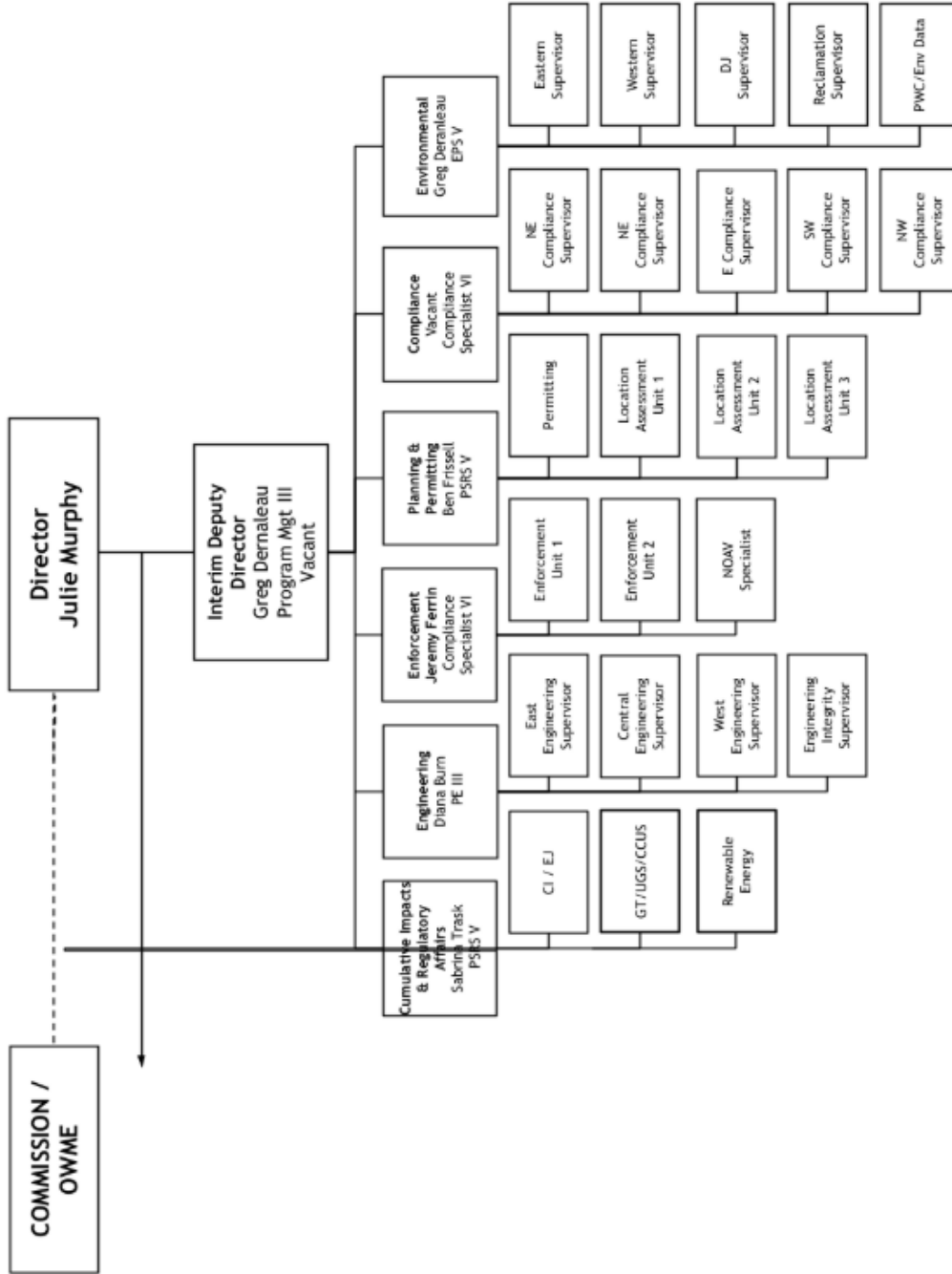
As previously stated, the new spill reporting thresholds and facility closure requirements have resulted in a substantial increase in the number of spills reported on Form 19s and the number of investigation and remediation projects established and reported on Form 27s. The significance of this increase indicates a measurable way to better protect the environment and groundwater resources at the end of the life of an oil and gas development project and a decreased risk of residual contamination being left in place for a surface owner or developer to discover later. Due to the required site assessments performed to document facility closure, more spills/releases were found and reported. In 2024, Colorado had 392 active spills (279 in the east and 113 in the west) and 1347 historic spills (1315 in the east and 32 in the west).

Through December 31, 2024, 421 spills or releases were discovered and reported at wellheads during P&A compared to the 216 spills or releases reported in 2023. Before 2021, these historic releases might not have been discovered or reported because there was no closure assessment required directly at the wellhead; the documentation of cleanup of these spills or releases is a net positive for the environment and groundwater protection, despite the numeric increase in spills reported.



Appendix 1: ECMC Organizational Chart

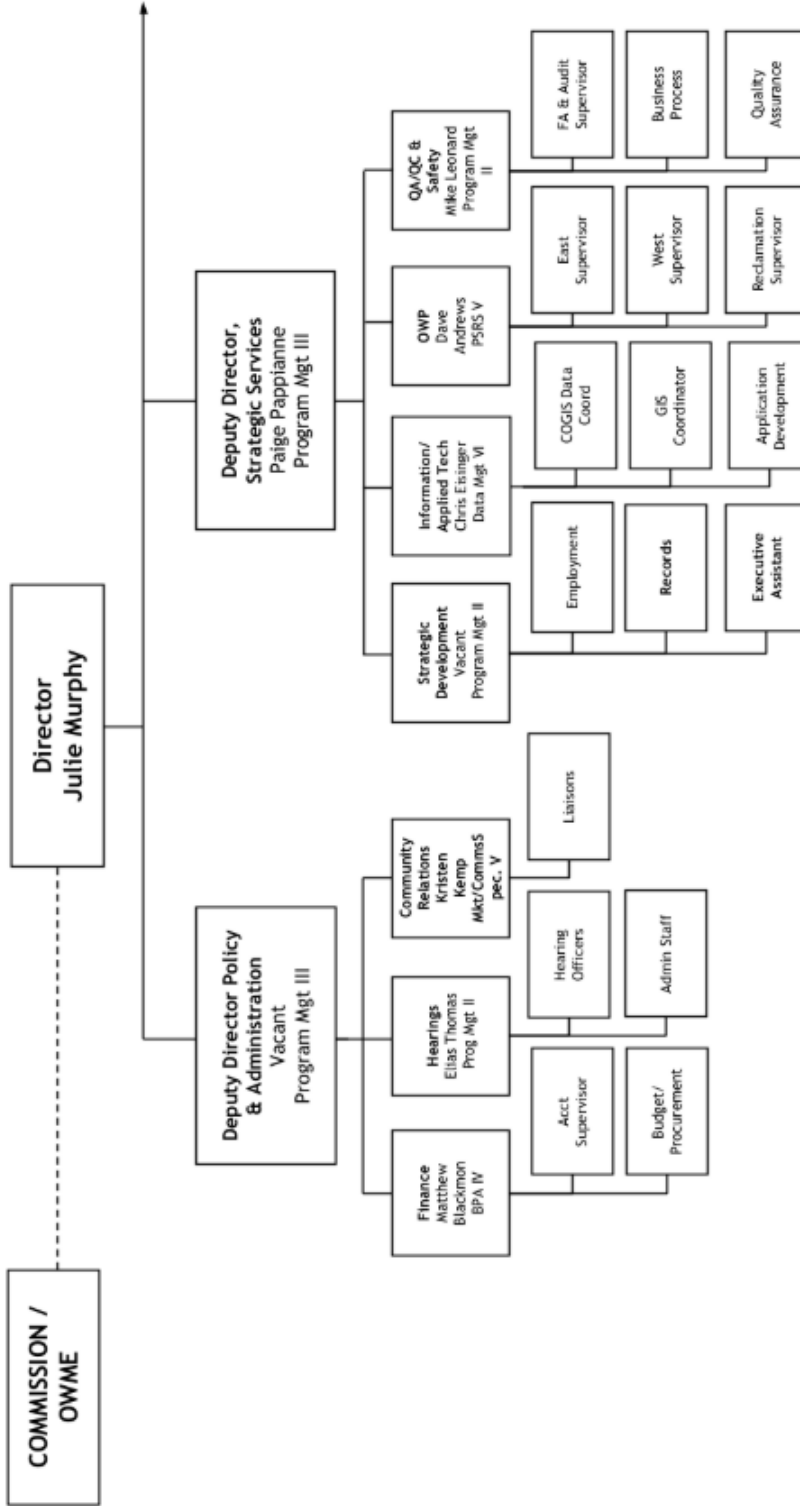
ENERGY & CARBON MANAGEMENT COMMISSION January 1, 2025



Key
 CI/EJ = Cumulative Impacts and Environmental Justice
 GT/UGS/CCUS = Geothermal, Underground Gas Storage, Carbon Capture and Underground Storage
 PE = Professional Engineer
 NOAV = Notice of Alleged Violation
 DJ = Denver Julesburg Basin

ENERGY & CARBON MANAGEMENT COMMISSION

January 1, 2025



Key
 Mgt = Management or Manager
 Mktg/Comms = Marketing and Communications
 Tech = Technologies
 COGIS = Colorado Oil and Gas Information System
 GIS = Geographic Information System
 OWP = Orphan Well Program
 QA/QC = Quality Assurance Quality Control
 FA = Financial Assurance

