

**2010 REPORT TO THE
WATER QUALITY CONTROL COMMISSION
and
WATER QUALITY CONTROL DIVISION
of
THE COLORADO DEPARTMENT OF
PUBLIC HEALTH AND ENVIRONMENT**

**by
THE COLORADO OIL AND GAS CONSERVATION COMMISSION**



**of
THE DEPARTMENT OF NATURAL RESOURCES**

**IN ACCORDANCE
WITH**

**THE AUGUST 28, 1990 MEMORANDUM OF AGREEMENT
and
THE IMPLEMENTING PROVISIONS OF SENATE BILL 181**

JANUARY 2011

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1. INTRODUCTION

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 ground water protection. This authority was provided by SB 89-181, and is restated and clarified by a Memorandum of Agreement (MOA) that was adopted by the agencies on August 8, 1990.

Section 5.1 of the MOA specifies that the COGCC must report annually to the WQCC about how its programs assure compliance with WQCC water quality standards and classifications for the activities, which are subject to the jurisdiction of the COGCC.

This 19th annual report includes a summary of COGCC activities and changes in ground water protection programs that were made during the preceding year. Major issues concerning the implementation of water quality standards and classifications are also reported.

2. COGCC ORGANIZATION AND FUNCTIONS

Public Outreach and Communication

The COGCC employs the following strategies for effective communication with the public and the regulated industry:

- Ten staff reports are prepared annually or submittal to the COGCC Commissioners. Ongoing staff activities such as compliance and enforcement actions, environmental and landowner issues, and other topics relevant to the mission of the COGCC are summarized in these reports. They are distributed widely to interested parties and they are posted on the COGCC website www.cogcc.state.co.us.
- A toll free telephone number (888-235-1101) to the Denver office has been established as a complaint hotline for citizen use.

The Commission attempts to hold at least three of its 10 hearings outside Denver each year. However, in 2010, due to budgetary constraints, the COGCC held only two of its regular hearings outside of Denver; one in Rifle (Piceance Basin) and one in Adams County (D-J Basin).

- The COGCC continues to solicit participation on all levels from stakeholders including, the oil and gas industry, local government, citizens, other agencies, agriculture, and the environmental community.
- The COGCC continues to expand our internet presence. In addition to accessing oil and gas well data, internet users are able to access information regarding pits, spills/releases, complaints, and remediation projects and reports from numerous baseline ground water quality studies and environmental monitoring and investigation projects. The queries by which users access these data continue to be modified and refined to make them more “friendly”. Please visit our website at www.cogcc.state.co.us, then “Staff Rpt”.

COGCC Commissioners

The Colorado Oil and Gas Conservation Act, as amended by HB 07-1341, requires that the Commission consist of 9 members. HB 07-1341 also includes the following requirements for the members: 7 members appointed by the governor with the consent of the senate and 2 ex officio voting members who are the Executive Directors of the Department of Natural Resources and the Department of Public Health and the Environment. At least 2 members are appointed from west of the continental divide and the other members are appointed taking into account the need for geographical representation of other areas of the state with high levels of oil and gas activity or employment. Of the seven, 3 members are to have substantial experience in the oil and gas industry and at least 2 of these must have college degrees in petroleum geology or petroleum engineering; 1 member must be a local government official; 1 member must have formal training or substantial experience in environmental or wildlife protection; 1 member must have formal training or substantial experience in soil conservation or reclamation; and 1 member must be actively engaged in agricultural production and also be a royalty owner. A chart showing in more detail the makeup of the COGCC Commission is included in Appendix 1.

COGCC Staff

The COGCC has 69 full time employees (FTE) positions, with Information Technology (IT) support provided by 4 employees of the Office of Information Technology. The current organization chart is included in Appendix 2.

The Engineering Unit includes 10 engineers/engineers-in-training and 1 engineering/environmental technician. One of the engineers and 2 of the engineers-in-training are located in Rifle and 1 of the engineers is located in Durango. The others are located in the Denver office.

The Environmental Unit includes 14 environmental protection specialists. Six of the environmental protection specialists (EPS II) are located in field offices in Brighton, Durango, Rifle, and Trinidad, which helps to minimize their complaint response time and maximize their ability to identify and address other potential environmental issues related to oil and gas development. The others are located in the Denver Office. The Oil and Gas Location Assessment (OGLA) group, which is part of the Environmental Unit, reviews the environmental information provided on Form 2As, as required by COGCC Rule 303.

The Field Inspection Unit has 15 FTE including three environmental protection specialists who bring additional expertise related to reclamation and other environmental issues. Three inspection supervisors, 9 field inspectors, and two EPS I - reclamation specialists are located in Broomfield, Cheyenne Wells, Durango, Fort Morgan, Grand Junction, Greeley, Louisville, Parachute, Pueblo, Rifle, Silt, Steamboat Springs, Trinidad, and Whitewater, which helps to maximize their time for field inspections and helps to minimize their response time for complaints and incidents.

COGCC Environmental Unit

The COGCC environmental staff all have professional experience and expertise in environmental issues associated with oil and gas operations, hydrogeology and geology. We continue to handle questions, concerns, problems, programs, and issues relating to the oil and gas industry's impact on the environment, including wildlife, and public health safety and welfare. In addition, 1 of the environmental protection specialists implements the COGCC's Onsite Inspection Policy, which is discussed in more detail in Part G. The environmental staff works closely with the COGCC engineering staff and the field inspectors. Incidents resulting in

environmental impacts are typically referred to the environmental staff for investigation and enforcement. The primary responsibilities of the environmental staff are discussed below.

Spill/Release Response

Operators are required to report spills and releases that occur as a result of oil and gas operations, in accordance with COGCC Rule 906. Produced oil, gas, and water are the substances most commonly spilled or released. These substances fall under the exploration and production (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 COGCC jurisdiction. Generally, impacts from these events are limited to soils and are relatively small.

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 protection of surface and ground water, in accordance with COGCC rules and WQCC standards and classifications. Spills are tracked in COGCC's Master Records Database (MRDB) and can be accessed via the COGCC website (www.cogcc.co.us, select Database, then Inspection/Incident, then Spill/Release). In 2010 approximately 438 spills and releases were reported and have been remediated or are in the process of being remediated.

Complaint Response

The COGCC responds diligently to complaints, which are received from individuals and other agencies. Complaints are tracked in the COGCC's MRDB and can be accessed via the COGCC website. In 2010 approximately 164 complaints were received. Often complaints are from landowners, alleging damage to their land or water wells. The environmental staff follows up where appropriate, collecting samples for laboratory analysis when necessary. Operators are required to perform additional investigation, remediation, and mitigation, as needed, to bring sites into compliance with soil and ground water standards.

Remediation Projects

Operators are required to remediate significant adverse environmental impacts that occur as a result of oil and gas activities. Situations requiring remediation often result from spills and releases of produced water and hydrocarbons discovered at the time of occurrence, during due diligence investigations, during the plugging of wells and abandonment of locations, or during pit closures. The environmental staff manages remediation projects by reviewing and approving plans, evaluating analytical data and the progress of the remediation work, and by ensuring that cleanup standards and other requirements for operators are met.

Remediation projects are tracked in the COGCC's MRDB database and can be accessed on the COGCC website. During 2010, approximately 57 operators submitted approximately 421 new remediation plans for approval and approximately 253 remediation projects were closed. The environmental staff managed a total of approximately 1,000 new and ongoing remediation projects during 2010.

Where ground water has been impacted, operators are required to: mitigate any continued release; investigate the extent of contamination; remove the source of contamination (such as the impacted soils in contact with ground water or free hydrocarbon product); remediate; establish points of compliance; and monitor contaminant levels.

Pit Program

During 2010, COGCC staff approved permits for approximately 200 new pits and approved the closure of approximately 46 pits. There are approximately 12,200 pits shown as open in the MRDB. COGCC environmental staff continues to verify this number as time allows.

Permitted Centralized Waste Management Facilities

Non-commercial centralized exploration and production (E&P) waste management facilities are permitted by COGCC under Rule 908. Generally these facilities are larger than a typical tank battery that might handle wastes from only one or a few wells. These larger facilities handle wastes from many wells and wastes that may be from more than one field or lease and may include lined pits, landfarms, or tank batteries. Rule 908 requires that operators apply for a permit and, as part of the approval process, staff evaluates the proposed site, operation, financial assurance, and preliminary closure plans. These facilities are currently required to have financial assurance in an amount equal to the estimated cost for proper closure, abandonment, and reclamation. During 2010 the COGCC permitted 1 new centralized E&P waste management facility, and permits for 2 new centralized E&P waste management facilities are currently being reviewed by staff. There are 28 active permitted centralized E&P waste management facilities in the state.

Disposal and Reuse of Produced Water

Approximately 44% of the water co-produced with oil and gas is disposed of or used for enhanced recovery by underground injection. Most produced water that is not injected is disposed in evaporation and percolation pits or discharged under Colorado Discharge Permit System (CDPS) permit, and a small amount of produced water is used for dust suppression on oil and gas lease roads. In addition, to minimize waste and the use of fresh water, more operators are reusing and recycling produced water and other fluids for drilling and well completion activities including hydraulic fracture treatment (“fracing”).

Onsite Inspections

In January 2005, COGCC adopted a policy to conduct onsite inspections where oil and gas wells are proposed on lands where the surface owner did not execute a lease or is not party to a surface use agreement. Under COGCC Rule 306, an operator is required to use its best efforts to consult in good faith with the affected surface owner with regard to locations of proposed wells and surface facilities, access roads, and final reclamation and abandonment. If the COGCC Rule 306 good faith consultation between the operator and the surface owner does not resolve operational issues related to the proposed well, the surface owner may request that the COGCC conduct an onsite inspection under the policy.

During the onsite inspection, the surface owner, operator, and COGCC staff meet at the location and discuss issues related to the proposed well and associated surface facilities. The local government designee may also attend if requested by the surface owner. Following the inspection, the COGCC may apply appropriate site specific drilling permit conditions, if necessary to avoid potential unreasonable crop loss or land damage, or to prevent or mitigate health, safety and welfare concerns, including potential significant adverse environmental impacts. Any such conditions of approval must be consistent with applicable Commission spacing orders and well location rules, and must take into account cost-effectiveness, technical feasibility, protection of correlative rights, and prevention of waste. The COGCC cannot require an operator to use an exception location, directional drilling techniques, or otherwise compromise its reasonable geologic and petroleum engineering considerations.

Since January 2005, the COGCC has received a total of 142 requests for onsite inspections. Thirty-two onsite inspections have been conducted, 97 requests for inspections have been withdrawn, and 13 onsite inspections are pending and will be scheduled, if necessary, after the Applications for Permit-to-Drill (APD) – Form 2s are received, or after issues related to local governmental designee consultation, location change, or surface use agreements are resolved.

Of the 142 requests for onsite inspection, 77 were for locations in Weld County, 25 in Las Animas County, 9 in Adams County, 7 in La Plata County, 5 in Garfield County, 3 each in Archuleta, Boulder, Logan, and Yuma Counties, 2 in Morgan County, and 1 each in Baca, Cheyenne, Kiowa, Larimer, and Washington Counties.

Where surface owners have requested Onsite Inspections after the 10 business-day window provided for in the Policy has elapsed, and where there is a dispute between parties regarding the date of the Rule 306 consultation, COGCC staff have attended meetings between parties on location to facilitate communication between the parties and to minimize impacts to the surface owner through voluntary measures implemented by the operator.

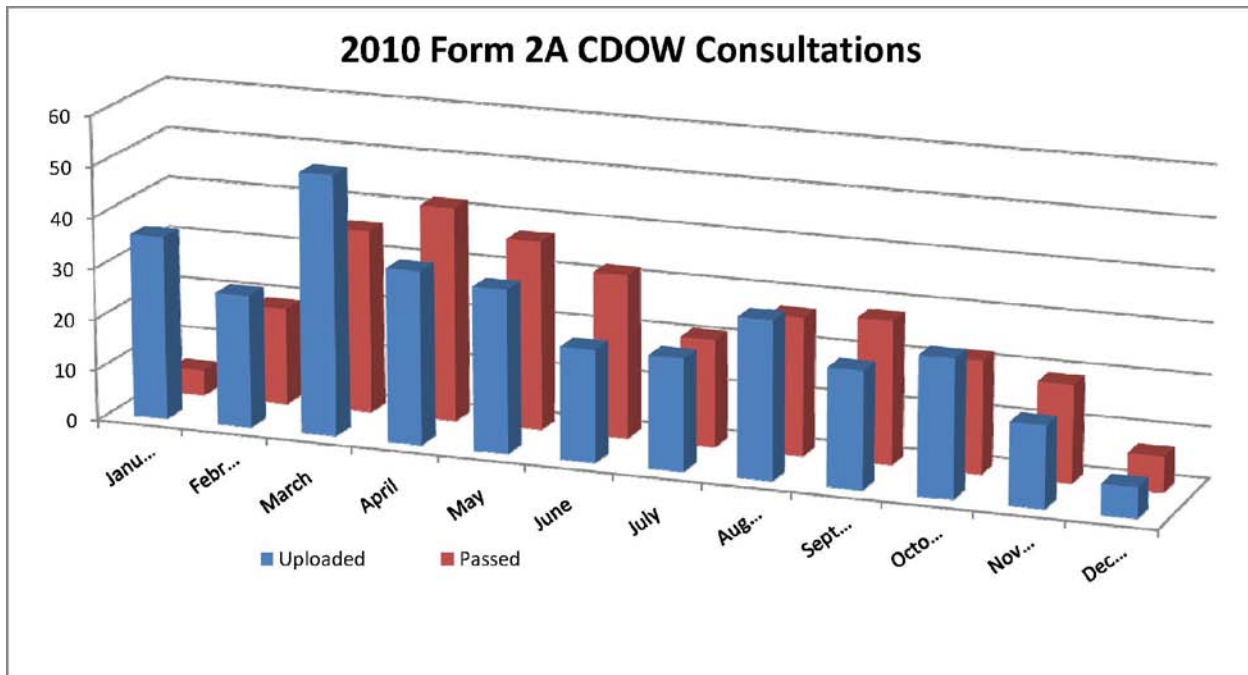
In addition to the Onsite Inspection Policy, onsite inspections are conducted in the San Juan Basin under Cause 112, Order Nos. 156 and 157 and numerous subsequent orders because they are required when an APD is submitted without a surface use agreement.

Oil & Gas Location Assessment (OGLA)

Since May 1, 2009 for federal land and April 1, 2009 for all other land in Colorado, operators are required to submit an Oil and Gas Location Assessment (OGLA) Form 2A for any “new oil and gas location”. The Form 2A requires environmental information about surface locations and provides for consultations by CDPHE and CDOW with the surface owner. Most operators are taking advantage of the COGCC’s “eForm” process and more than 90% of the Form 2As are submitted, reviewed, modified, and approved electronically.

The Form 2A provides site specific environmental information that the OGLA specialists review and evaluate to determine whether the proposed oil and gas operations have the potential to negatively impact public health, safety and welfare, including the environment and wildlife resources. The OGLA specialists review the information provided and apply site-specific conditions of approval to prevent or mitigate potential impacts. One critical part of the evaluation is the sensitive area determination and the evaluation of water resources. OGLA specialists consider proximity to surface and ground water, terrain, topography, local geology and soil types to determine whether the proposed location is situated in a sensitive area. Once the sensitive area determination is made, appropriate protective measures are considered and applied. The Form 2A process allows the COGCC to work cooperatively with operators to protect water resources by advanced planning and proactive operational measures. The process should result in fewer poorly designed and/or poorly operated oil and gas facilities causing impacts to water resources.

The OGLA group also facilitates the consultation process with CDPHE and CDOW. In 2010 COGCC staff consulted with CDPHE on 44 proposed oil and gas location - Form 2As. In addition the COGCC consulted with CDOW on approximately 326 proposed Form 2As. The following chart summarizes monthly CDOW consultation activity.



Oil and Gas Conservation and Environmental Response Fund (Fund 170)

The COGCC receives an annual appropriation of \$312,033 that is used primarily by the environmental staff to respond to and investigate complaints alleging impacts from oil and gas operations, and an appropriation of \$325,000 that can be used to conduct special environmental projects such as baseline ground water testing, gas seep investigations, regional investigations of potential impacts from oil and gas operations, and to verify COGCC information. Because of the COGCC's need to respond to emergency situations related to oil and gas operations, the COGCC has been appropriated \$1,500,000 for emergency response activities. In addition, the COGCC continues to receive an appropriation of \$220,000 for plugging, abandoning, and reclaiming orphaned wells.

In 2010 the COGCC used the \$312,033 appropriation to respond to and investigate complaints and spills/releases, and to ensure compliance with COGCC rules. In addition Special Environmental Projects conducted by the COGCC environmental staff included: ongoing monitoring of methane impacts to ground water from an orphaned gas well in Bondad; oversight of required environmental monitoring for gas wells drilled in the vicinity of the Project Rulison and Project Rio Blanco nuclear test sites; third party review of engineering, ground water, and geologic data related to concerns in Garfield County regarding potential impacts from oil and gas activity; ongoing investigation of ground water and surface water impacts from leaking pits in Garfield County; ongoing investigations of gas seeps associated with orphaned oil and gas wells in Fremont County; and ongoing monitoring, investigation, and remediation oversight related to ground water and water well impacts from gas development in Huerfano County .

The COGCC engineering staff used appropriated funds and claimed financial assurance to plug and abandon and to reclaim orphaned oil and gas sites in Archuleta, Fremont, La Plata, Mesa, Routt, Washington, and Weld Counties. In FY 2010-2011 the engineering staff plans on plugging, abandoning and reclaiming orphaned oil and gas wells in Cheyenne, Fremont, Mesa, and Rio Grande, Counties.

In addition, approximately \$1.5 million dollars was spent in FY 2009-2010 on the 4M

Project, which is related to monitoring and mitigating impacts from coalbed methane development in La Plata and Archuleta Counties. These monies came from an additional appropriation.

Data Management and Geographical Information Systems (GIS)

In response to the implementation of the new rules in April of 2009, changes were made to the applications that support the data systems to accommodate tracking and the overall processing of permits. Major modifications were made to the following systems along with their associated databases:

- Permit processing – eForm was implemented;
- COGIS Database – Many new tables and queries to support eForm and other applications;
- Imaging System – Migration from Content Manager to LaserFiche
- GIS- Addition of several new map layers.

A brief description of the changes for each system is provided below:

Permit Processing -eForm

The eForm application allows Operators to submit Applications for Permit to Drill, (Form 2) and Oil and Gas Location Assessment, (Form 2A) electronically. The COGCC staff then reviews the forms along with the electronically submitted attachments. Each staff member involved in the process then passes their portion of the form (i.e. spacing, engineering, etc.) online. Paper files are not generated for these new permits. Each form is assigned a number of tasks that must be passed before the form is approved. All of the tasks are listed and the status of each task is visible on the public interface. As the form is working its way through the COGCC review process, the public is able to track the status of the form through the use of the public user interface. The IT staff is currently converting additional COGCC Forms to the electronic format.

Database

The database that supports the agency underwent numerous modifications in 2010. One new major entity added to the database is the “Location”. A Location exists independent of the oil and gas facilities that may be on it. It is best described as a geographic area where oil and gas activities take place. This definition is consistent with the Oil and Gas Location Assessment Regulatory review process. A Location is related to all of the wells that are on it, along with all of the associated equipment and facilities. This information can be obtained from the online database “Scout Card” by clicking on the “Related” link.

Data improvement and cleanup activities are an ongoing process. A project to migrate the environmental data from Access to the SQL-server database is scheduled to begin in January 2011. The project is tasked with identifying new processes to allow for electronic submission of analytical data that are required by a variety of rules and orders and in support of investigations, spill/release responses, and remediation activities.

Document Imaging

LaserFiche allows for improving functionality with respect to uploading and indexing images. The system provides users with tools to sort and query the image repository in ways that were not previously possible.

GIS

The GIS Online map continues to be a critical application that staff, industry, other agencies, and the general public depend on to process permits, create reports and to view information that can assist in exploration programs, or address environmental concerns. Additionally certain rules require industry to view the online map to determine if a proposed location falls within a CDPHE 317B Buffer Zone, a Sensitive Wildlife Habitat (SWH), and/or a Wildlife Restricted Occupancy (RSO) Area.

The GIS Online map contains over 100 map layers including oil and gas wells, permits, spacing orders, field boundaries, along with a number of base layers such as cities, rivers, roads, sections, land ownership, etc. Aerial photos, topographic quads, and geologic maps are displayed as images in the map. The well points, permits, and a few other layers are produced dynamically by a direct connection to the MRDB, so that if a new well is permitted it will show up immediately on the map.

During the upcoming year, new online mapping software will be tested and deployed.

Online Access to Baseline and Special Studies Reports

The written reports for COGCC managed baseline sampling projects and other special environmental studies, such as the Water Well Booklet and Water Quality Trend and Data Analysis for the San Juan Basin are posted on the website under the “Library” tab where they are primarily organized by basin. Many of these reports are in PDF format and can be downloaded.

Industry Services

The COGCC continues to promote its mission to foster the responsible development of Colorado’s oil and gas natural resources by providing information and assistance in complying with the COGCC rules and requirements. Our expanded website and GIS capabilities support this mission.

Industry Compliance/Violations/Penalties

In 2010, the COGCC pursued a backlog of enforcement matters, most of which involved incidents that had occurred in previous years. The COGCC Commission assessed penalties against 10 operators for violations of rules and orders. The total amount of penalties assessed was approximately \$1,200,000, of which \$1,180,000 was associated with enforcement for violations that resulted in actual or potential impacts to public health, safety, welfare, and water resources.

Underground Injection Control (UIC)

COGCC staff continues to work with WQCD and EPA staff to ensure that operators of Class II injection wells in Colorado are in compliance with ground water standards and classifications, and that points of compliance are established. COGCC approved 23 Class II UIC well permits during 2010.

3. COGCC COORDINATION WITH WQCD/WQCC

In 2010 the COGCC, WQCD, and WQCC staff and commission representatives met twice. Craig Wiant and Joshua Epel represented the WQCC and COGCC commissions, respectively.

4. OIL & GAS EXPLORATION & PRODUCTION ACTIVITY IN COLORADO BY REGION/FIELD

This section summarizes oil and gas activities within Colorado and highlights COGCC studies, issues and concerns relating specifically to ground water by region. In each region there are remediation projects of various sizes and types in which impacted soils and/or ground water are being investigated or cleaned up by operators. Not all of the projects are described in this report. The COGCC environmental staff directs and monitors these projects, as described in Section 1.

Southwest Colorado

Oil and Gas E&P Activity

Most of the gas produced in the southwestern part of Colorado comes from coalbed methane (CBM) wells. Drilling activity has decreased in response to lower gas prices throughout the region. In 2010 approximately 245 permits for new wells and recompletions of existing wells were approved. Currently there are approximately 3,241 active wells in La Plata County. These wells produce approximately 1.09 billion cubic feet (bcf) of natural gas per day, which is approximately 30% of the total gas production in the state. Also there are approximately 466 active oil, gas, and carbon dioxide wells in four other southwestern Colorado counties, including San Miguel, Dolores, Montezuma, and Archuleta. Approximately 95% of the carbon dioxide produced in the state is produced from wells in Montezuma County.

Public Involvement

Gas and Oil Regulatory Team (GORT)

In 2000 the COGCC established the Gas and Oil Regulatory Team (GORT) to provide a forum for meaningful dialogue between operators, citizens, county and local governments, the Southern Ute Indian Tribe, the Bureau of Land Management (BLM), the US Forest Service (USFS), and the COGCC. Members of this group continue to fund and provide technical support for the ongoing monitoring and mitigation of methane seeps along the Fruitland Coal outcrop.

Northern San Juan Basin Stakeholders Group

In July 2006 the USFS and BLM issued the final Environmental Impact Statement (EIS) for the Northern San Juan Basin. As an outgrowth of the EIS process, the USFS and BLM established the Northern San Juan Basin Stakeholders Group to provide a forum similar to the GORT group, but one that more directly addresses issues relating to oil and gas development within the EIS geographic area.

Ground Water and Other Environmental Issues

Conditions for Optional Additional Coalbed Methane Wells

As a result of COGCC Orders 112-156 and 112-157 and numerous subsequent orders related to CBM development in the San Juan Basin, operators have collected more than 5,300 water samples from more than 2,100 water wells. The analytical results have been submitted to

the COGCC and to the land owners. To date impacts to water wells from CBM wells drilled under these orders have not been detected. As a result of the December 2008 rulemaking, water well sampling in advance of CBM development is now required statewide by COGCC Rule 608.

3M-4M Project

Methane gas has been observed seeping from the outcrop of the Fruitland Formation in many areas along the northern margin of the San Juan Basin in southwestern Colorado. Some of these seeps were identified prior to the initial development of any Fruitland Coal wells; however, in places the intensity and areal extent of these seeps appears to have increased subsequent to CBM production. Recent seep monitoring, however, has indicated an apparent decrease in gas seepage at the outcrop in La Plata County over the past 2 years (2009/2010). This is consistent with 3M modeling predictions. Methane seeps from the Fruitland Formation have not been found in Archuleta County.

In 2000, the COGCC and the BLM funded the “3M Project” to include **M**apping, **M**odeling, and **M**onitoring of the Fruitland Outcrop in La Plata County. Tasks included the installation of a network of monitoring wells at 4 locations between the outcrop of the Fruitland Formation and down basin production. The wells are equipped with transducers and data loggers and are used for the long term monitoring of pressure and water levels in the Fruitland Formation. A total of 7 wells, were completed and data continues to be collected. Pressure monitoring data from these wells are available upon request from the COGCC. In late 2009 upgraded transducers and data loggers were installed in each of the existing 7 outcrop monitoring wells so that satellite telemetry could be used to collect and transmit data from these remote locations.

In 2007 the COGCC received an additional appropriation of \$4,452,000 from Fund 170 for the Fruitland Formation Seep Mitigation Project in La Plata County and the Fruitland Formation Outcrop Monitoring Project in Archuleta County; collectively known as the “4M Project”, **M**itigation being the fourth “**M**”. The COGCC allocated \$2,944,000 of this appropriation to evaluate methods for mitigating the seepage of methane gas and to expand the existing monitoring network along the outcrop of the Fruitland Formation in La Plata County, and \$1,508,000 to install monitoring wells in the Fruitland Formation in Archuleta County. The COGCC Commission approved a mill levy increase under §34-60-129 C.R.S., which was required to fund the 4M Project.

This project builds on and adds to the existing 3M Project monitoring network and included geological mapping of the outcrop in Archuleta County by the Colorado Geological Survey. Between 2007 and 2010 a total of 3 additional monitoring wells were installed in La Plata County in areas where access had previously been denied, and the monitoring network was extended into Archuleta County with the installation of 7 new monitoring wells between the La Plata County line and the Southern Ute Indian Tribe (SUIT) reservation boundary. All monitoring wells are equipped with downhole pressure transducers that communicate twice daily via satellite telemetry to a central data-center managed by InSitu, Inc.

The first phase of the mitigation portion of the 4M Project was to install, test and operate 2 pilot scale methane gas collection systems in La Plata County, one along the South Fork of Texas Creek and one in the Pine River Ranches subdivision. Methane gas escapes from the outcrop of the Fruitland Formation to the atmosphere via surface seeps at these locations, killing vegetation and creating safety hazards. The intent of each system was to capture the gas in the shallow subsurface and route it to a combustion chamber where it could be used to generate electricity to power the mitigation system.

Start-up of both 4M Outcrop Mitigation Pilot Projects in La Plata County occurred during the week of May 4, 2009, and continuous operations were implemented during the week of May 18, 2009. Both systems are functioning as planned; however, methane concentrations are too low and oxygen is too high at the Pine River Ranch (PRR) for effective combustion.

During 2010 the South Fork Texas Creek (SFTC) Mitigation system was optimized to increase gas collection and electrical generation. The most significant methane seep at this location was within the stream channel, which had been avoided during the initial design phase due to permitting and logistical issues coupled with the uncertainty of success. The original design focused on the installation of 4 separate land-based reverse french-drain systems to capture and transport the gas to a central turbine combustion unit which would produce power to run the system and net-meter any excess back into the grid. Although operational glitches did routinely occur during start-up, the system was a success and during 2010 an Army Corps of Engineers permit was obtained and the collection system was extended underneath the creek itself. Gas production almost doubled in volume and methane concentrations stabilized, allowing for significant additional electrical generation ranging from about 5,000 to 9,800 KWH per month. Re-vegetation has been successful above the collection systems and a significant amount of gas has been captured and prevented from entering the atmosphere.

4M well installation and mitigation reports can be found on the COGCC website (www.cogcc.state.co.us) under Library, Area Reports/Data, San Juan Basin, 4M Project Reports.

During 2010, approximately \$500,000 was used to install and instrument monitoring wells, to optimize the SFTC mitigation system and to provide operation and maintenance support for the entire monitoring and mitigation network. COGCC staff was unable to obtain site access to install one additional monitoring well in La Plata County prior to expiration of SB 198 funds on June 30, 2010.

Fruitland Outcrop Study La Plata County and Archuleta County

Industry, BLM, and the COGCC continue to contribute money and/or staff for the ongoing evaluation, maintenance, and monitoring of the 140 permanent soil gas monitoring probes and one meteorological station. Aerial surveying with infrared imagery technology is also being used to detect areas of stressed and/or dead vegetation, which can be an indication of methane gas seepage. This detailed work has been expanded to cover the entire Fruitland Formation outcrop in La Plata County and Archuleta County on land north of the Southern Ute Indian Tribe reservation boundary. The expanded survey includes the mapping of springs discharging from the Fruitland Formation. The 2003, 2004, 2005, 2006, 2007, 2008 and 2009 La Plata County reports are available on the COGCC website (www.cogcc.state.co.us) under Library, Area Reports, San Juan Basin, 3M Project Reports. The 2004, 2005, 2006, 2007, 2008 and 2009 Archuleta County reports are available on the COGCC website (www.cogcc.state.co.us) under Library, Area Reports, San Juan Basin, Archuleta County.

San Juan Basin Ground Water Quality Analysis (WQA)

The objective of this study is to assess potential long-term trends in general groundwater quality in the San Juan Basin based on data available in the COGCC database. Data for more than 2,000 water wells in the San Juan Basin from a period of approximately 15 years was used. Statistical evaluations were conducted by the COGCC's contractor using the Mann-Kendall trend analysis as a means to filter a large amount of data to allow staff to identify and focus on potential areas of concern. Runs were limited to those wells with at least 4 available data points (sampling events) to best delineate statistically significant or relevant trends. Parameters evaluated included: total dissolved solids, alkalinity, pH, calcium, magnesium, potassium, sodium, carbonate, bicarbonate, chloride, sulfate, methane, and ratios of two stable isotopes of methane, deuterium and carbon-13.

Initial evaluation of available data using the Mann-Kendall trend analysis did not delineate any clusters of significant upward trends in methane or major cation/anion concentrations within the San Juan Basin. To the contrary, just as many significant downward

trends were identified as significant upward trends. Annual screenings of the database, as new data become available, will be conducted in January of each year. Further evaluation of individual wells exhibiting trends and/or changes in methane concentrations will be conducted by the COGCC on a well-by-well basis. Additional graphical representation using all wells, not just those with 4 or more data points, will also be developed to identify and assess potential areas of concern, and followed by investigation and corrective actions if warranted. The final report can be found on the COGCC website (www.colorado.gov/cogcc) under Library, Area Reports/Data, San Juan Basin, Studies in the San Juan Basin

Citizen Complaints, Spills and Other Issues Regarding Ground and Surface Water

The COGCC received 12 complaints alleging impacts from or because of concerns about potential impacts from oil and gas operations in La Plata, Archuleta, Montezuma and Dolores Counties. Eight (8) complaints alleged impact to water wells and 4 were requests for baseline sampling. COGCC staff determined that 4 of the water well complaints were not related to oil and gas activities. Four (4) complaints are still under investigation or are delayed due to landowner access issues. In addition, staff continues to monitor several water wells previously impacted by an orphaned gas well, which was plugged by the COGCC in 2006.

The COGCC received 5 complaints regarding other environmental damage or operational issues. Of these 1 was a noise complaint, 1 was related to reclamation or surface damage issues, 1 was related to ground vibration, and 2 were related to pad housekeeping and waste management issues.

Twelve spills/releases of E&P waste were reported in La Plata and Montezuma Counties during 2010. Of these, 4 were releases to surface water. Two of the surface water releases occurred on the Southern Ute Indian Tribe (SUIT) reservation and one on federal land under BLM jurisdiction. COGCC offered assistance in each case, but the SUIT and BLM, respectively, took the lead in oversight of the assessments and remedial action. Site Investigation Remediation Work Plans (Form 27s) were submitted for review and approval for the releases where the COGCC took the regulatory lead. The site cleanup is complete and is currently in a monitoring phase. All of the other spill cases, except one where data are pending, have been closed.

COGCC staff and third party contractors continue to investigate and monitor soil and ground water impacts associated with methane leakage from a 1930's orphan oil and gas well (Bryce 1-X). COGCC has shown that this well and a previously plugged and abandoned orphan well (Nick Spatter Bryce Farm #1) were the sources of the elevated levels of methane in the subsurface soils and in 6 nearby water wells. Fund 170 money has been used to respond to this emergency situation by installing methane monitors and alarms in three homes, a fire station, and a water well house, to continue monitoring of the areal extent of the gas seepage, and to investigate and identify the source of the gas. In July and August 2006 COGCC staff and a third party contractors successfully plugged and abandoned the Bryce 1-X. This resulted in a decrease in the concentration of methane in the soil. Methane has not been detected in the soil and shallow subsurface since July 2007, which was again confirmed by a follow-up soil gas survey in September 2010. Elevated concentrations of methane persist in the ground water and water wells; however ongoing ground water sampling indicates a gradual decrease in the methane concentration in each well.

COGCC staff in southwest Colorado is working with area operators to systematically assess the status of "pits" in the COGCC database throughout the region. In 1995 operators were required to submit an inventory of all of the "pits" they operated. In addition to pits, some operators reported containment vessels, including partially buried steel and fiberglass tanks,

and these were entered into the database as “pits”. The intent of this assessment is to update the database to accurately reflect waste management facilities previously and currently used in the San Juan Basin.

Northwest Colorado

Oil and Gas E&P Activity

Northwest Colorado continues to experience a high level of oil and gas activity, especially in Garfield, Mesa, and Rio Blanco Counties. Northwest Colorado drilling permits account for approximately 46% of the state total (34% in Garfield County, 7% in Rio Blanco County, and 5% in Mesa County). The driving force behind this active development continues to be the extensive natural gas reserves in the Piceance Basin, and an expanding pipeline infrastructure that enables improved marketing of natural gas from the area.

Public Involvement

The Northwest Colorado Oil and Gas Forum

The Northwest Colorado Oil and Gas Forum (NWCOGF) meets quarterly in Rifle. The NWCOGF is an important forum for the discussion of oil and gas issues and concerns at the local level. The participants include the COGCC, other federal, state, and local government agencies, the oil and gas industry, and concerned landowners and citizens. Meetings are well attended by the various stakeholders.

Southern Piceance Basin Water Resource Project

The COGCC assisted the USGS in developing a common repository for water quality data. Significant water-resource data sets, publications, and other materials have been developed for the Southern Piceance Basin from numerous agencies, energy companies, private consulting firms, universities, and stakeholder groups. A web-based repository has been created that will improve understanding of factors affecting water resources in the Southern Piceance Basin. The link to this repository is: <http://rmgsc.cr.usgs.gov/cwqdr/Piceance/>

Environmental Issues

COGCC staff investigated citizen and other agency’s complaints and responded to requests for baseline sampling, processed and tracked spill/release reports submitted by operators, and followed up on the findings of COGCC field inspections and conducted other environmental studies in northwestern Colorado. In accordance with the MOA for Response to Spills/Releases to Surface Water, the COGCC notifies the CDPHE of releases impacting waters of the state. In all cases where ground water was impacted, operators were required to conduct a site investigation and perform appropriate remediation to comply with COGCC requirements.

Ground Water

There were 24 complaints alleging impacts to water wells or requesting baseline sampling in the northwestern portion of Colorado. Upon investigation, COGCC staff determined that no water wells had been impacted by oil and gas operations.

The COGCC investigated a number of complaints about releases of exploration and production (E&P) waste that either impacted or threatened to impact ground water in northwestern Colorado. In one instance, COGCC staff determined that ground water had been impacted by a pipeline leak and issued an NOAV to the operator, who has developed and implemented a phased remediation plan Form 27.

Two (2) ground water impacts that had been previously identified as a result of on-going monitoring continue to be investigated by COGCC and the operators. In addition, impacted ground water was discovered by an operator who was investigating another matter. The operator has submitted a Form 27 and is remediating the impact.

Surface Water

There was 1 spill/release of E&P waste fluids that impacted surface water in Mesa County. In this case, the operator responded with appropriate emergency procedures and other corrective measures to comply with COGCC and WQCD requirements. Finally, there were 10 spill/releases of E&P waste fluids that impacted either surface water or dry drainages leading to surface water. In each of the above-mentioned situations, the COGCC has enforced on the responsible operators or enforcement actions are pending. In addition, the COGCC reported these spill/release events to the WQCD in accordance with our MOA.

There were 20 complaints requesting baseline sampling of surface water that is used for livestock watering. Water samples were collected for laboratory analysis and based upon the analytical results and other information gathered during our investigations, COGCC staff determined that surface water had not been impacted by oil and gas operations.

COGCC Enforcement Related to Impacts to Ground Water, Surface Water, and Springs

In 2008, COGCC received a number of complaints alleging impacts to springs, and operators submitted numerous Spill/Release Reports - Form 19 regarding impacts to springs, ground water and surface water on the Roan Plateau from spills and releases of E&P waste. Upon investigation, COGCC staff determined that ground water and surface water in certain areas and several springs had been impacted. As part of the COGCC staff's efforts to pursue our backlog of enforcement matters, during 2010 enforcement actions were taken against two operators related to three springs impacted by E&P wastes, including the Prather Spring, Rock Spring, and the Conn Camp Spring. These matters were resolved by Administrative Orders by Consent and penalties were assessed by the Commission. The COGCC staff consulted with WQCD Enforcement Group during the resolution of these matters. Staff continues working on enforcement regarding other impacts on the Roan Plateau, with a goal of completing the remaining matters in early 2011.

Drilling Near Project Rulison Test Site

In 1969, the Atomic Energy Commission, a predecessor to the U.S. Department of Energy (DOE), conducted several experiments on the use of nuclear devices to enhance natural gas production from wells. The project conducted in Garfield County is known as Project Rulison and the well in which the nuclear device was detonated is located on Battlement Mesa.

In 2005, Presco Corporation (PRESCO) submitted APDs for and began drilling a number of wells in Garfield County in the vicinity of Project Rulison, but outside the 0.5 mile buffer zone established by the COGCC. To address concerns regarding the potential for new gas wells to intercept materials impacted by the nuclear test, PRESCO agreed to conduct a monitoring program to test for radionuclides. This monitoring program included background monitoring of non-impacted gas and water from the Williams Fork Formation and overlying formations, of surface and ground water in the vicinity, and monitoring of drilling mud, cuttings and gas brought to the surface during drilling, completion, and production at selected locations. Reports summarizing the results of the 2004 Baseline and the 2005 and 2006 Annual Water Sampling

activities conducted by PRESCO have been submitted to the COGCC. PRESCO also submitted reports summarizing the results of Gas Well Drilling Monitoring activities to the COGCC. These reports are available on the COGCC website, www.cogcc.state.co.us under Library.

The U.S. Department of Energy – Office of Legacy Management (DOE-OLM) completed a Draft Rulison Path Forward report. DOE developed the path forward report as guidance for Colorado state regulators and other interested stakeholders in response to increased drilling for natural gas reserves in the vicinity of the Project Rulison test site. COGCC and CDPHE staff reviewed the report and their comments are being incorporated by DOE-LM. The Draft Path Forward Report is available on the DOE-LM website at <http://www.lm.doe.gov/land/sites/co/rulison/rulison.htm>.

Noble Energy, Inc., EnCana Oil & gas (USA), Inc., and Williams Production RMT, Inc. prepared revision 3.0 of the Sampling and Analysis Plan (SAP). This version of the SAP, comments from regulatory agencies and other interested parties, quarterly monitoring reports, and annual monitoring reports are available on the COGCC website (www.cogcc.state.co.us) under Library, Piceance Basin. Additionally, an email address has been set up to convey Project Rulison related information. That address is: Rulison.submittal@state.co.us.

Drilling Near Project Rio Blanco Test Site

Project Rio Blanco is the site of the detonation of three 30 ± 3 -kiloton nuclear devices at depths of 5,838, 6,230, and 6,689 feet below ground that occurred on May 17, 1973. The oil and gas operators, in consultation with other affected working interest owners, have voluntarily agreed to a drilling moratorium within the area between the 600-foot Department of Energy (DOE) exclusion zone and a ½-mile radius of Project Rio Blanco until additional radiological data have been collected outside of this zone to demonstrate that gas drilling, completion, and production can be safely accomplished.

The operators also agreed to a voluntary drilling exclusion zone around the Fawn Creek Government No. 1 (FCG No. 1) well where radioactively-contaminated water produced from the Rio Blanco test well was injected into an interval between 5,360 and 6,072 feet below the ground surface. Although the federal government did not implement a drilling exclusion zone around FCG No. 1, the voluntary drilling exclusion zone around this well will be maintained until sufficient radiological data have been collected to confirm that radionuclide at the FCG No. 1 well have not migrated to producing gas wells outside this zone. Under the voluntary drilling exclusion zone, the operators propose to limit drilling and gas production within a 600-foot radius of the FCG No. 1 well to a true vertical depth of 6,500 feet below ground surface. FCG No. 1 is also within the ½-mile voluntary drilling moratorium area discussed above.

The COGCC has adopted special procedural requirements regarding APDs in the Project Rio Blanco area. The COGCC collaborated with the CDPHE, BLM, DOE, Rio Blanco County, operators and surface owners in the preparing and releasing version 1.0 of the Sampling and Analysis Plan (SAP). The SAP and related information and correspondence are available on the COGCC website, www.cogcc.state.co.us under Library. Additionally, an email address has been set up to convey Project Rio Blanco related information. That address is: Rio Blanco.submittal@state.co.us. In 2010 there was no drilling near Project Rio Blanco.

West Divide Creek Gas Seep Remediation Update – Garfield County

In accordance with the COGCC requirement for periodic reporting on the ongoing remediation of shallow ground water contamination at the West Divide Creek Seep, EnCana

provides quarterly reports on the status of the seep remediation and these status reports are available on the COGCC website (www.cogcc.state.co.us) under Library, Piceance Basin. The low-flow air sparge system designed to remediate shallow ground water contaminated with benzene, toluene, ethylbenzene, and total xylenes (BTEX), continues to decrease concentrations and areal extent of these compounds in the impacted area. The concentration and areal extent of thermogenic methane in the ground water in the impacted area also continues to decrease although at a lower rate than the BTEX compounds. There were no detections of BTEX compounds in any West Divide Creek surface water sample locations in 2010.

DeBeque Orphan Natural Gas and Oil Wells – Mesa County

The COGCC identified 11 orphaned natural gas or oil wells in Mesa County during 2010. Orphaned natural gas or oil wells are those for which the operators have gone out of business and no current operator of the wells can be located. Historic records were located for some of the orphaned natural gas wells indicating that they were drilled in 1911. Others are believed to have been drilled in the mid-1920's. Seven of the orphaned wells identified are discharging produced water to the ground surface from the surface casing; and water is flowing into nearby drainages, ditches or water features from four of those wells.

The COGCC has successfully plugged and abandoned one of the seven wells so that it is no longer discharging produced water. An attempt to plug and abandon a second orphan well was not successful because surface casing could not be located before the limits of the excavator were reached. The scope of work required to plug and abandon this orphan well exceeded that anticipated and funded. Funding from the COGCC emergency response appropriation will be used to plug this well and one of the others. The plugging and abandonment of the remaining orphan wells will be prioritized based on potential risk and impact to the environment, including ground and surface water resources, and public health and safety. Plugging and abandonment of these wells will proceed as time and funding allows.

Northeast Colorado

Oil and Gas E&P Activity

Oil and gas activity in the northeastern portion of the state remains high, although overall numbers of new permits are lower than previous years. In general this reflects the slowdown related to low natural gas prices. In 2010, approximately 36% of the total number of well permits approved by the COGCC was issued to operators in Weld County (Wattenberg Field), which has the largest number of active wells in the State. Smaller oil and gas fields with lower levels of activity are located in other counties throughout northeast Colorado. In 2010 approximately 172 billion cubic feet (BCF) of gas were produced in northeast Colorado (approximately 16% of the total gas production for the State) and 13 million barrels (bbls) of crude oil were produced (approximately 65% of the total crude oil production for the State).

Public Involvement

COGCC staff continues to receive and follow-up on complaints from the Weld County Department of Public Health & Environment, Tri-County Health Department, Larimer County Environmental Advisory Board, Morgan County Office of Emergency Management, Northeast Colorado Health Department, other municipalities, and the public throughout northeastern Colorado.

In response to concerns from residents in the South Park area regarding the potential for impacts from proposed oil and gas activities, the COGCC attended a public meeting in Fairplay in July, 2010. The meeting was hosted by State Senator Mark Scheffel and Representative Tom Massey and included presentations by the COGCC, the Division of Water Resources, the State Land Board as well as the operator of the proposed wells. Citizen concerns were primarily focused on potential impacts to surface and ground water resources. COGCC has continued to meet with area residents to discuss COGCC Rules and the possibilities for baseline groundwater sampling.

In September, COGCC worked with the Town of Windsor and Synergy Resources to present a summary of the environmental review process and down-hole engineering measures taken to protect groundwater and water wells during oil and gas activities. The public meeting was held following receipt of comments and questions related to oil and gas operations planned in close proximity to a residential neighborhood. One result of the public involvement was a sampling event conducted by COGCC staff to document baseline water quality conditions in the residential irrigation water supply system.

Environmental Issues

COGCC staff investigated citizen and other agency's complaints and responded to requests for baseline sampling, processed and tracked spill/release reports submitted by operators, and followed up on the findings of COGCC field inspections and conducted other environmental studies in northwestern Colorado. In accordance with the MOA for Response to Spills/Releases to Surface Water, the COGCC notifies the CDPHE of releases impacting surface water. COGCC staff and third party contractors collected water samples from 20 water wells and four surface water locations for laboratory analysis.

Ground Water

In all cases where ground water was impacted, operators were required to conduct site investigations and perform appropriate remediation to comply with COGCC requirements. In addition, the COGCC continues to oversee the investigation and remediation of contaminated soil and ground water associated with gas plants and compressor stations throughout northeast Colorado.

The water sampling conducted by operators as required under COGCC Rule 318A.e. has identified several water wells impacted by thermogenic gas. Upon investigation, COGCC staff determined that 5 water wells had been impacted. The investigations to identify the sources of the gas in these water wells are continuing. In three instances, the owners of the impacted water wells and the operators have either reached private settlements that include hook up to a public drinking water source, or longer term solutions to the water supplies are under discussions with the affected well owners. One ground water monitoring well was found to have been impacted by thermogenic gas and the source of that gas is under investigation.

COGCC Enforcement Related to Impacted Water Well, Weld County

In August 2009, the COGCC received a complaint from a landowner regarding his concern that his domestic water well had been impacted by nearby oil and gas operations. The COGCC collected samples from the water well for laboratory analysis. Methane was detected at a concentration of 17 mg/L. The results of the stable isotope and compositional analysis confirmed that the gas was thermogenic. The COGCC requested oil and gas operators to perform bradenhead tests on all oil and gas wells within a half mile of the impacted water well. The bradenhead test performed on one nearby oil and gas well indicated a hole in the

production casing. COGCC staff collected a sample of the bradenhead gas and submitted it for stable isotope and compositional analysis. The isotopic composition was consistent with the composition of gas in the water well confirming that this gas well was the source of contamination. COGCC staff also collected samples for laboratory analysis from other domestic water wells in the vicinity of the impacted water well. The analytical results verified that no other water wells were impacted by the release.

COGCC issued an NOAV to the operator requiring them to fix the leaking production casing in the well and a second NOAV to address environmental impacts including providing a replacement water supply for the impacted landowner. COGCC engineering staff worked with the operator to ensure that the oil and gas well was properly plugged and abandoned. The landowner had a replacement water well installed and was reimbursed in full for the cost of the well by the operator. This matter was resolved by an Administrative Order by Consent and a penalty was assessed by the Commission.

Wattenberg Field - Bradenhead Testing Area, Weld County

In response to incidents of water wells impacted by thermogenic methane and other hydrocarbon gases from oil and gas activities, the COGCC staff proposed and on November 30, 2009 the COGCC Commission approved, the establishment of a bradenhead testing area covering approximately 25 townships of the Wattenberg Field in Weld County. This provides the COGCC and operators with a tool for cost effectively and systematically identifying oil and gas wells with a potential to act as conduits for gas migration into the Laramie/Fox Hills and other aquifers. As these wells are identified, operators are required to perform appropriate remediation.

Surface Water

There was 1 spill/release event in which E&P waste fluids reached surface water. This was reported to the WQCD in accordance with our MOA. In cases where surface water was impacted, the operators responded with appropriate emergency procedures and other corrective measures to comply with COGCC and WQCD requirements.

COGCC Enforcement Related to Impacts Surface Water

In 2007, COGCC received a complaint from Weld County alleging impacts to the Cache La Poudre River and adjacent land from improperly managed drilling fluids. Upon investigation, COGCC staff determined that surface water and soils had been impacted. The COGCC issued NOAVs to two operators, who immediately mitigated and remediated the situation. As part of the COGCC staff's efforts to pursue our backlog of enforcement matters, during 2010 enforcement actions were taken against the two operators whose E&P waste had impacted the Cache Le Poudre River and adjacent land. These matters were resolved by Administrative Orders by Consent and penalties were assessed by the Commission. The COGCC staff consulted with WQCD Enforcement Group during the resolution of these matters.

Baseline Water Quality Sampling – Elbert, Jackson, Park and Weld Counties

COGCC has initiated discussions with a number of operators regarding a surface and ground water sampling program in Elbert, Jackson, Park and Weld Counties in areas where the Director has approved drilling permits for horizontal wells in the Niobrara Formation in un-spaced areas and where the Commission has issued recent spacing orders for horizontal wells in the Niobrara Formation. These sampling efforts will supplement previous work by COGCC staff to establish baseline water quality in advance of further development of oil and gas

resources in these areas. Sampling would continue during the long term development of the resource and the results would be used to help determine whether impacts from oil and gas operations have occurred. A document with a draft of the proposed water sampling requirements was distributed to operators for comments on November 1, 2010.

In addition, COGCC environmental staff has responded to several requests for baseline water quality sampling and has provided concerned landowners with information about the COGCC permitting and regulatory process.

Oil and Gas Location Assessment Volume, Northeast Colorado

The Northeast region continues to be an active area for oil and gas development; approximately 75% of oil and gas location assessment Form 2As received in 2010 were from twelve counties in northeast Colorado. Of those, 1,417 or 58% of all Form 2As received were submitted for locations in Weld County. Operators are submitting location assessments for single vertical well pads, multi-well directional pad locations, multi-well remote tank battery locations, and horizontal well pad locations. Horizontal well bores in the Niobrara Formation are becoming more common in northern Weld County, as drilling and completion technology allows operators to produce oil from a historically tight formation. In many cases, operators are drilling wells diagonally across entire sections, and completing the wells with multi-stage hydraulic fracturing techniques that expose significantly more well bore to the producing formation. The long-term economics have yet to be determined as the drilling and completion costs for this type of well is substantially higher than traditional drilling and completion operations. But many operators are increasing their presence in Weld, Elbert, Park and Jackson Counties in anticipation of developing the oil resources of the Niobrara Formation.

Southeast Colorado

Oil and Gas E&P Activities

Southeastern Colorado produces conventional gas, CBM gas, and crude oil from several basins, including the Raton, the D-J and the Hugoton Embayment. There are approximately 3,693 active wells within the region. Approximately 2,906 and 293 of the active wells are located in Las Animas and Cheyenne Counties, respectively. Approximately 70 billion cubic feet (bcf) of gas was produced in this region during the first six months of 2010, with 84% of the gas produced from the 2,906 CBM wells in Las Animas County. A total of 956,112 barrels (bbls) of crude oil were produced in southeastern Colorado in the first six months of 2010 with 72% of the oil production coming from the 293 wells in Cheyenne County

Approximately 212 drilling permits were issued for oil and gas wells in southeastern Colorado in 2010. Approximately 82% of the 212 were issued in four counties (41% in Las Animas, 23% in Lincoln, 11% in Fremont, and 8% in Cheyenne).

Approximately 55,000,000 barrels of produced water were generated in southeast Colorado during the first six months of 2010. Eighty-nine (89) per cent of the produced water was generated from CBM wells in Las Animas County. Produced water is managed by underground injection, CDPS permitted surface water discharge, and in evaporation/percolation pits. There are eighty four (84) active injection wells in this region; 39 in Cheyenne County, 15 in Las Animas County, 13 in Baca County, 10 in Kiowa County, and 7 additional wells in various other counties.

Public Involvement

COGCC staff participated as a stakeholder in the Colorado Water Quality Forum Agricultural Diversion Work Group held in previous years. The work group consisted of representatives from the oil and gas industry, the Colorado Water Quality Control Division (WQCD), irrigators, the agriculture community and wastewater treatment facilities. Permits, including narrative standards that were discussed by this group to protect agricultural interests, have been issued to four operators in the Raton Basin. Norwest Applied Hydrology (on behalf of Pioneer Natural Resources) installed and maintains continuous monitoring stations in the Apishapa River drainage in an attempt to better define possible impacts from WQCD permitted discharges of CBM produced water into the waters of the state. Temperature, conductivity and pressure are monitored at 3 locations in the watershed. Local irrigators have access to data collected from these stations (<http://www.apishapawatershed.org/>).

The measurement of pressure can be used to estimate flow. The conductivity of the water can be used to calculate sodium adsorption ratio (SAR) by comparison with laboratory measured sodium, calcium and magnesium concentrations collected on a monthly basis. Three oil and gas operators installed a similar 9 station continuous monitoring network in the upper Purgatoire River drainage as part of an effort to gather information that might aid them in understanding whether there are impacts from discharging produced water from CBM wells under permits issued by the WQCD (<http://purgatoirewatershed.org/>).

Environmental Issues

COGCC staff investigated citizen complaints and followed up requests for baseline water sampling, investigated the findings of COGCC field inspections, and conducted special projects and emergency response actions. The citizen complaints included investigating water wells, sampling produced water, investigating pit overflows and leaks, sampling springs and soil. The special projects included two ground water monitoring projects, soil sampling at an abandoned pit, and gas sampling at two leaking orphaned gas wells. A methane monitoring project was also completed including soil surveys, ground water sampling, and well testing and monitoring.

Ground Water

Twenty-seven (27) water wells were sampled during 2010. Five water wells were sampled as part of continuing investigations of impacts from CBM operations in Huerfano County. Nine (9) water wells were sampled in and around the North Fork Ranch area in Las Animas County as part of investigations regarding possible impacts to groundwater from nearby CBM operations.

Alleged Impacts from Hydraulic Fracture Stimulation (Fracing)

Alleged impacts to groundwater quality from hydraulic fracture stimulation operations of a CBM well in the North Fork Ranch area in Las Animas County were thoroughly investigated by COGCC staff. No impacts to groundwater quality accessed by the domestic water well were found.

Baseline Sampling

Thirteen water wells were sampled at the request of landowners to establish baseline conditions prior to drilling. Overall the water quality in the sampled wells is good.

Huerfano County Methane in Water Wells

As part of the ongoing investigation, monitoring, and mitigation efforts conducted by a CBM operator in response to impacts to water wells, more than 85 water wells are routinely monitored for methane. Gas samples have been collected from approximately 20 water wells. Stable isotope analysis of these samples indicate that the gas is thermogenic and similar to the CBM gas produced from the Vermejo Formation. The operator's CBM wells remain shut-in as specified by order of the COGCC Commission.

The operator has also installed a monitoring well, 3 gas removal wells and 8 injection wells as part of the remediation and investigation activities. As required by the COGCC order, the operator began active pump and treat operations of water from the impacted Poison Canyon Formation in December 2008. Phase 2 of the remediation process began in August 2010 after approvals were granted by EPA, Division of Water Resources and the COGCC staff. One CBM well is pumped solely to provide additional water for the remediation process. All water is now treated in a reverse osmosis plant before injection to meet requirements imposed by EPA and COGCC staff. Prior to initiation of Phase 2, the operator obtained numerous water quality samples within the remediation area. Analysis of these samples and comparison to samples required to be collected in the first three months of operation of Phase 2 is underway.

Corsentino Dairy Farms Site Investigation and Remediation Workplan

The owners of Corsentino Dairy Farms, Petroglyph Energy Inc. (PEI), and COGCC staff have reached agreement on a voluntary site investigation and remediation workplan intended to remediate impacts to soils at the dairy farm from CDPHE-WQCD permitted discharge of CBM produced water by PEI into the Cucharas River upstream of the dairy's irrigation water intake. Corn has been harvested for silage from all fields and soil sampling and analysis completed. A meeting to discuss and evaluate crop yield and effectiveness of the remediation to date will be held in mid-January 2011.

COGCC Enforcement Related to North Fork Ranch Water Well Impacts and Ongoing Investigation

COGCC Staff and a gas operator continue to investigate and monitor 2 domestic water wells in the North Fork Ranch (NFR) subdivision in western Las Animas County that were impacted during the drilling of the surface casing for a nearby CBM well in 2006. In 2010, these two matters were resolved by Administrative Orders by Consent and penalties were assessed by the Commission.

The gas operator has installed 5 monitoring wells in this area. The monitoring includes downhole continuous monitors for pressure and electrical conductivity. Water samples are collected and analyzed on a regular basis and the analytical results for samples from the monitoring well system are reported to the COGCC on a semi-annual basis. The initial 3 monitoring wells were installed in late November 2006 and 2 domestic wells have been added to the monitoring network, 1 in 2007 and 1 in 2008. No pressure upsets have been observed since installation of the monitoring network.

In fiscal year 2008-2009, benzene was detected above the groundwater standard in 2 of the monitoring wells installed by the operator. Dissolved methane concentrations in 2 of the operator's monitoring wells also increased significantly. Five NOAVs have subsequently been issued concerning continuing or new impacts to groundwater from CBM activities in and around the North Fork Ranch subdivision. The source of benzene detected above the groundwater standard in the 2 monitoring wells has not been determined at present. The source of

increasing methane concentrations in 4 of the monitoring wells may be of microbial and not of thermogenic character.

Lincoln County Ground Water Impact

The investigation and remediation of a well site in Lincoln County continued in 2010. The soils and groundwater at this site were impacted due to the improper management of E&P waste. The issue was first observed during an inspection conducted by a COGCC field inspector. The operator has submitted a Form 27 Site Investigation Plan and has conducted an extensive soil and groundwater investigation. The investigation has included the installation of monitoring wells and ground water and soil sampling. Analytical data indicates that the shallow alluvial aquifer has been impacted by produced water. Additional work has included the excavation and remediation of the pit and removal of all production equipment from the site.

Elevated levels of total dissolved solids (TDS) are present in the groundwater, but BTEX compounds have not been detected. The extent of the plume has been determined and points of compliance established. No water wells have been impacted. Quarterly monitoring is conducted and results evaluated. The results of the most recent sampling event indicate that, although groundwater quality has improved since use of the evaporation pit ceased in 2007, concentrations of chloride and TDS in groundwater still exceed allowable concentrations (defined as 1.25 x background).

Springs

No impacts to springs were observed in the 2010.

Surface Water

Spills of E&P Waste to State Waters

There were 11 spills/release events in which E&P waste entered surface water. E&P waste spilled was mainly CBM produced water. These 11 events occurred within the Raton Basin. WQCD staff was notified as required under the MOA between WQCD and COGCC.

Stormwater and Surface Water Complaints

One complaint alleging inadequate implementation and maintenance of stormwater best management practices along a lease road was investigated. The operator had installed sediment traps after a previous complaint and successfully performed interim reclamation and maintained the installed BMPs. The operator installed additional stormwater diversions and additional sediment filtering capacity after site visits with COGCC staff.

Orphaned Wells and Sites

Methane seeping from the Trinidad MGP-1 well caused a house explosion in 2007 and in response to this emergency situation the COGCC attempted to plug the leaking well; however these efforts were not successful and gas still is leaking. Currently the well is surrounded by a security fence and, to prevent gas from building up in the subsurface, gas is allowed to vent to the atmosphere from the well.

One pre-1910 orphaned well in Fremont County in close proximity to an occupied home was plugged by the COGCC. Several other orphaned oil wells have been identified for future plugging by the COGCC. COGCC staff will be developing a program to systematically search for additional orphaned wells that may pose a threat to public health, safety, and welfare.

APPENDIX 1
COGCC COMMISSION

Colorado Oil & Gas Conservation Commission Statutory Requirements

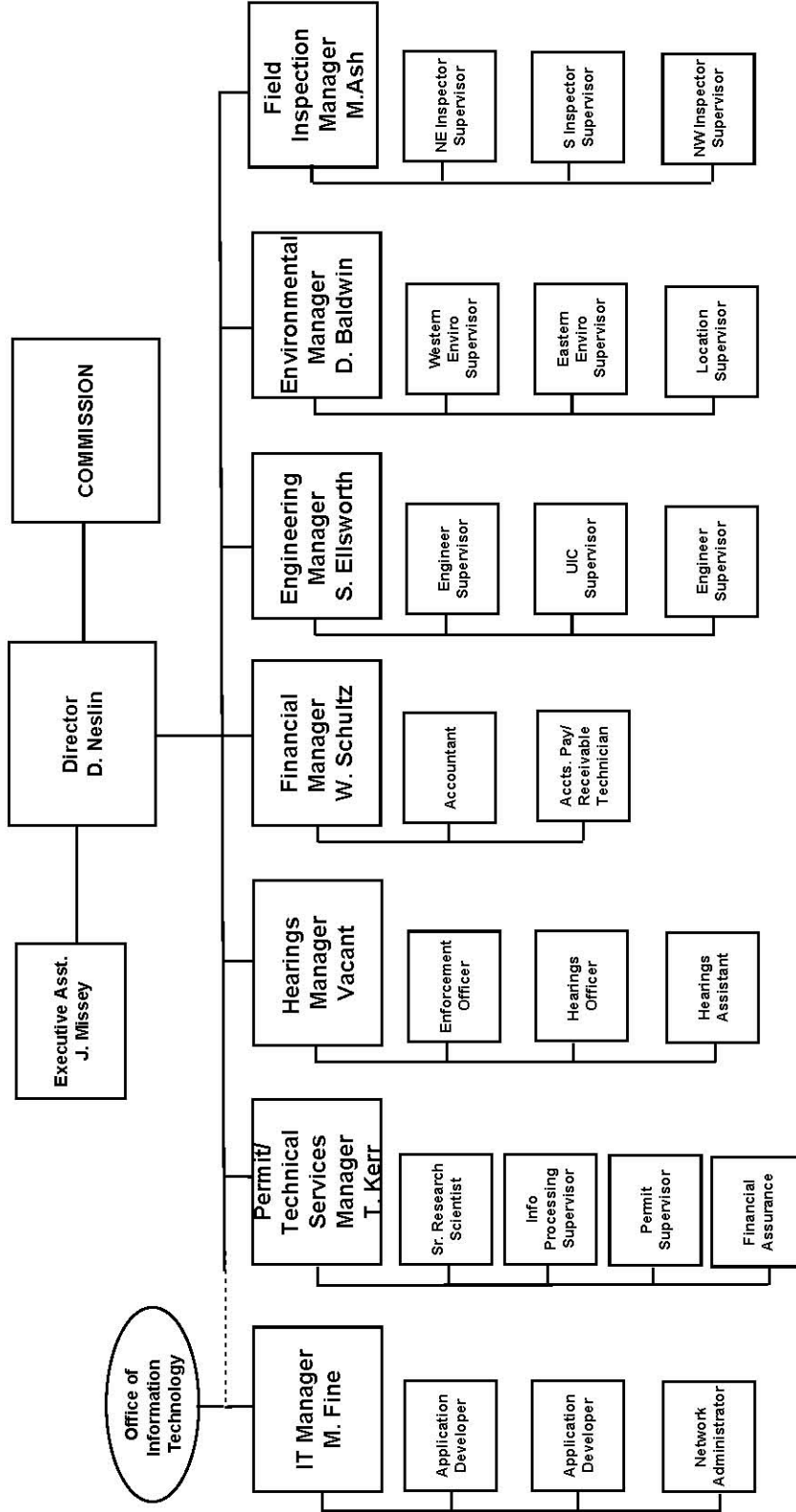
*Please note that information within parentheses is additional background information and not a statutory requirement

Commissioner (Officer)	2 Executive Directors (ex-office voting members) (Current Employment)	2 West of Continental Divide (Resident County)	3 with Substantial Oil & Gas Experience (Employed by Oil & Gas Industry) (Current Employment)	2 Out of 3 Must Have a College Degree in Petroleum Geology or Petroleum Engineering	1 Local Government Official (Current Employment)	1 with Substantial or Environmental or Wildlife Protection Experience (Current Employment)	1 with Substantial Soil Conservation or Reclamation or Experience (Current Employment)	1 engaged in Agricultural Production and a Royalty Owner (Current Employment)	Maximum of 4 from Same Political Party (excluding Executive Directors)	Current Term Expires
Richard Alward		X (Mesa)					X (Ecologist)		D	7/1/2011
Tom Compton		X (La Plata)						X (Rancher)	R	7/1/2011
Mark Cutright		(Arapahoe)	X (Yes) (Engineer)	X					R	7/1/2011
Michal Dowling Vice Chair		(Denver)				X (Foundation President)			U	7/1/2011
Joshua Epel Chair		(Arapahoe)	X (Yes) (Attorney)						D	7/1/2011
DeAnn Craig		(Denver)							R	
Vacant										
Mike King	X (Department of Natural Resources)	(Denver)								
Martha Rudolph	X (Department of Public Health and Environment)	(Denver)								

Commissioner requirements are set by statute in the Oil and Gas Conservation Act at §34-60-104 (2) (a)(1), C.R.S. (Current as of 11-16-2009)

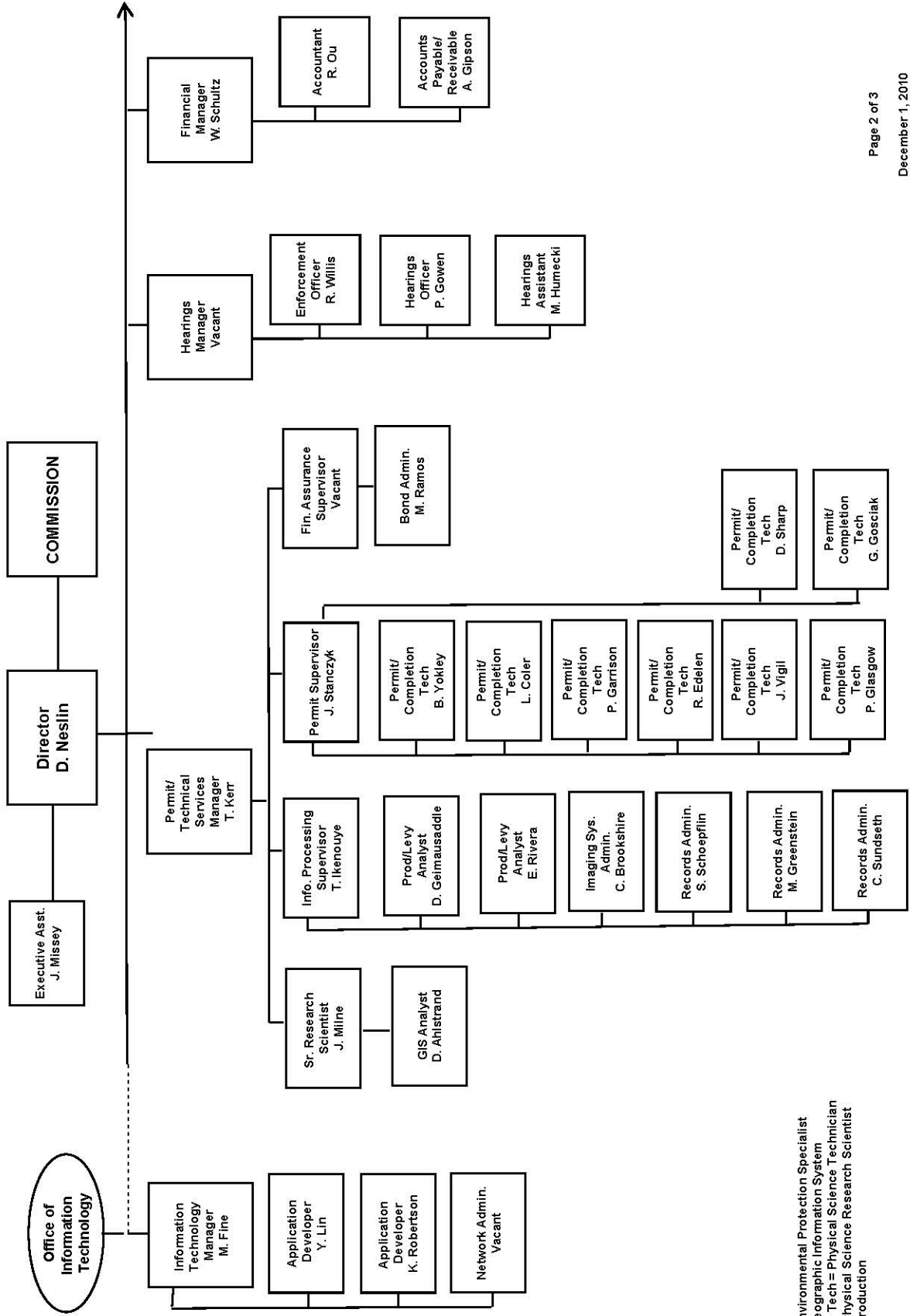
APPENDIX 2
COGCC ORGANIZATION CHART

COLORADO OIL & GAS CONSERVATION COMMISSION



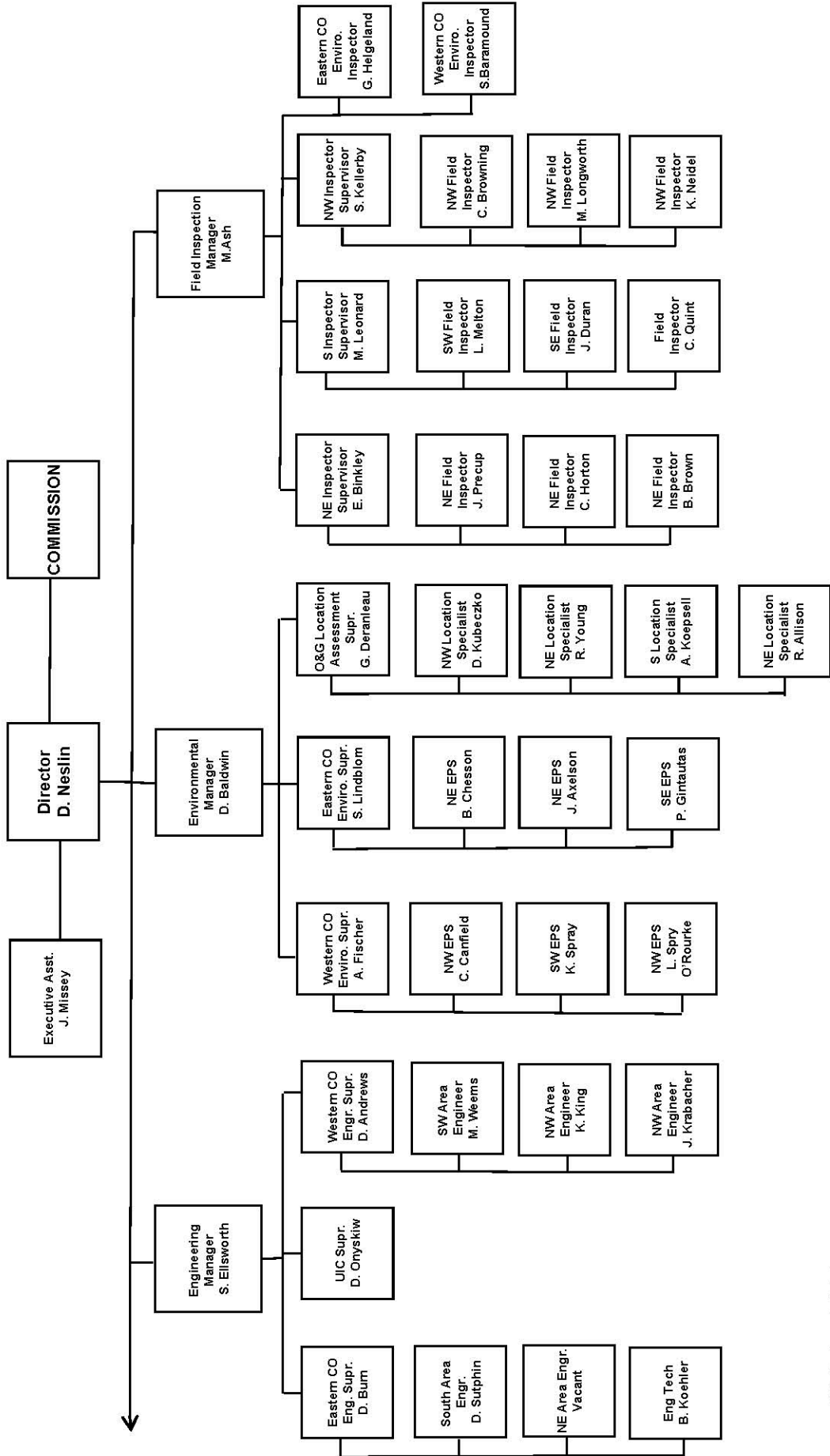
See the next two pages for details

COLORADO OIL & GAS CONSERVATION COMMISSION ORGANIZATION



EPS = Environmental Protection Specialist
 GIS = Geographic Information System
 Phys/Sci Tech = Physical Science Technician
 PRRS = Physical Science Research Scientist
 Prod = Production

COLORADO OIL & GAS CONSERVATION COMMISSION ORGANIZATION



EIT = Engineer in Training
 EPS = Environmental Protection Specialist
 OGLA = Oil & Gas Location Assessment
 Phys Sci Tech = Physical Science Technician
 UIC = Underground Injection Control