

Energy & Carbon Management Commission - Cumulative Impacts

Legislative Interim Committee on Ozone Air Quality

Karin McGowan, ECMC Commissioner

November 8, 2023



CO L O R A D O

**Energy & Carbon Management
Commission**

Department of Natural Resources

Legislation Related to Cumulative Impacts

SB19-181

“In consultation with the Department of Public Health and Environment, evaluate and address the potential cumulative impacts of oil and gas development”

HB23-1294

“By April 28, 2024, the Commission shall promulgate rules that evaluate and address the cumulative impacts of oil and gas operations. The rules shall include a definition of cumulative impacts.”



SENATE BILL 19-181

BY SENATOR(S) Fenberg and Foote, Court, Gonzales, Lee, Moreno, Story, Williams A., Winter;
also REPRESENTATIVE(S) Becker and Caraveo, Arndt, Benavidez, Bird, Buckner, Duran, Gonzales-Gutierrez, Gray, Herod, Hooton, Jackson, Jaquez Lewis, Kennedy, Kipp, Lontine, McCluskie, Melton, Michaelson Jenet, Mullica, Roberts, Singer, Sirota, Snyder, Sullivan, Tipper, Valdez A., Weissman.

CONCERNING ADDITIONAL PUBLIC WELFARE PROTECTIONS REGARDING THE CONDUCT OF OIL AND GAS OPERATIONS, AND, IN CONNECTION THEREWITH, MAKING AN APPROPRIATION.

Policy Related to Cumulative Impacts

Governor's NOx Reduction Letter (March 2023, found [here](#))

- ECMC and CDPHE work to reduce NOx emissions 30% by 2025, 50% by 2030 from 2017 baseline
- ECMC to promulgate Best Management Practice rules related to ozone emissions reductions
- ECMC to develop an environmental best management practice program

Cumulative Impacts Strategies

- A. SB19-181 Rulemaking
- B. Individual Oil and Gas Development Plan (OGDP) Assessment and Analysis
 - a. Form 2B: Cumulative Impacts Analysis
 - b. Cumulative Impacts Plan
- C. Annual Cumulative Impacts Report
- D. Cumulative Impacts Rulemaking

Cumulative Impacts Strategies

A. SB19-181 Rulemaking

Numerous Rules adopted or revised by the Commission in the 200-600 and 800/900/1200 Mission Change Rulemakings were a starting point to evaluate and address cumulative impacts.

Rules now limit where oil and gas locations are sited and/or require additional strategies to avoid, minimize and mitigate impacts from development. Including but not limited to:

- Alternative Location Analysis
- 2,000 ft setbacks from residential building units, schools, etc.
- Protections for High Priority Habitat for wildlife
- Robust community engagement
- Consultation and collaboration with sister agencies (Public Health and Wildlife)

Comparing Pre- and Post- SB19-181 Permit Approvals

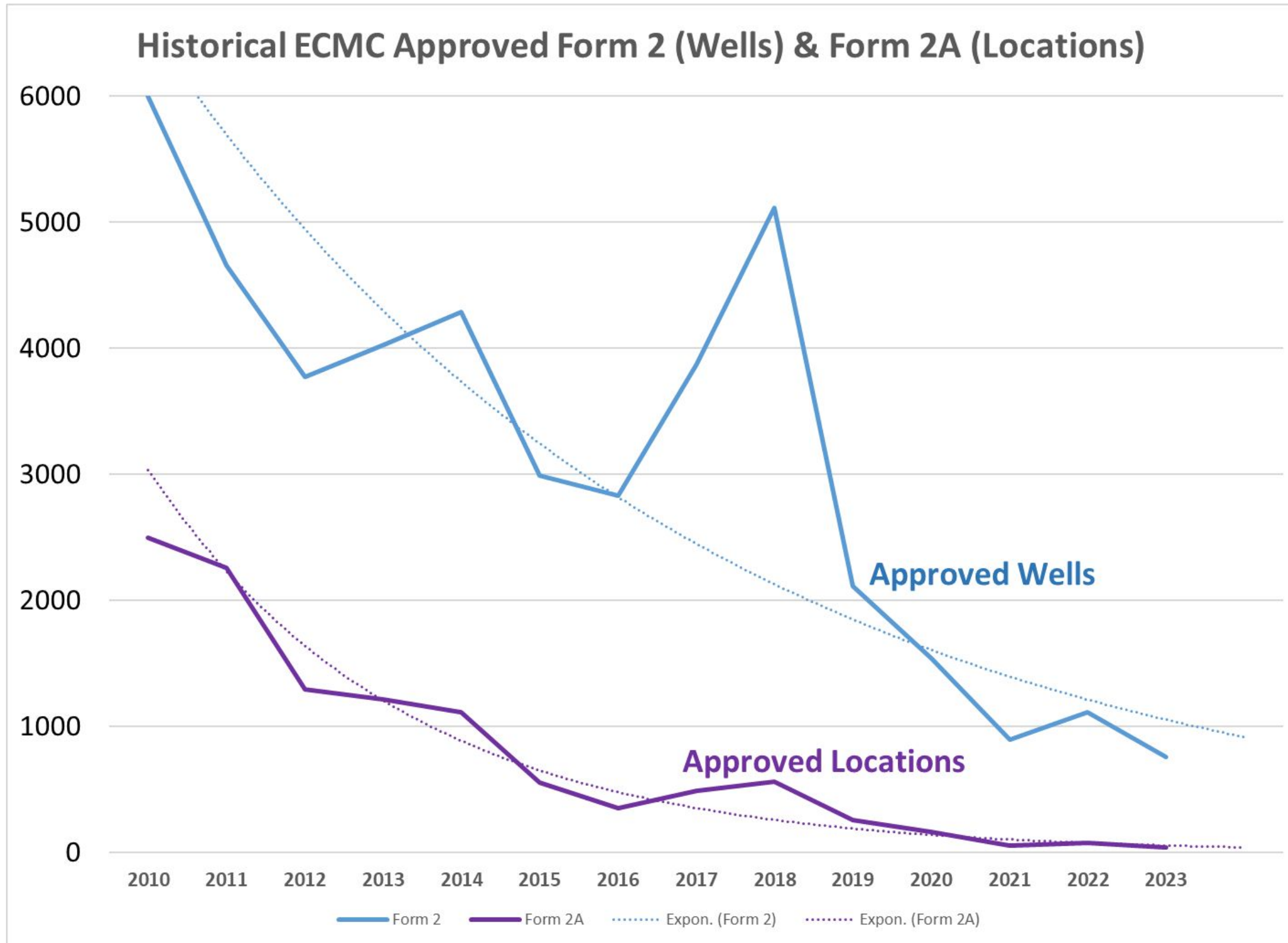
- Pre-SB19-181: 2017-April 2019
 - Locations (Form 2As): 1,180
 - Wells (Form 2s): 10,205
- Post-SB19-181: 2021-August 2023
 - Locations (Form 2As): 172
 - Wells (Form 2s): 914



Post-SB19-181 Year-by-Year

- 2021
 - Locations (Form 2As): 55
 - Wells (Form 2s): 41
- 2022
 - Locations (Form 2As): 78
 - Wells (Form 2s): 465
- 2023
 - Locations (Form 2As): 39
 - Wells (Form 2s): 408

Permit Trends



ECMC permits approved for locations and wells

data source: ECMC database

Cumulative Impacts Strategies

B. Individual Oil and Gas Development Plan (OGDP) Assessment and Analysis

CIDER AND THE FORM 2B

Rule 303.a.(5) Cumulative Impacts Data Evaluation Repository (CIDER) - lists the information required to be submitted with OGDPs via the Form 2B and includes but is not limited to

- Number of wells and associated equipment, location, etc.
- Air Emissions (pre-production and production)
- Noise, light, dust, odor impacts
- Water Resources (amount and source(s))
- Ecosystem and Wildlife Resources (habitat type, acreage, protected species, etc.)
- Existing oil and gas locations and equipment within one mile
- Public Welfare (residential/high occupancy units within 2000' and 5280')

Form 2B Example - Emissions

Pre-Production Emissions

Complete the following chart based on the estimated total equipment emissions (in tons) for the Oil & Gas Location during the pre-production (construction, drilling, completions) stage for Criteria Pollutants by equipment type.

	NOx	CO	VOCs	Methane	Ethane	CO2	N2O
Process Heaters or Boilers	1.1	0.17	0.05	0.01	0.0024	164.24	0.0013
Storage Tanks	0.01	0.05	0.05	0.24	0.08	26.86	0
Venting or Blowdowns	0.01	0.04	0.37	0.47	0.17	19.19	0
Combustion Control Devices	0	0.02	0.03	0.08	0.03	6.3	0
Non-Road Internal Combustion Engines	62.81	68.13	8.6	1.18	0.06	6297.06	0.03
Drill Mud	0.05	0.23	0.44	1.05	0.13	8.81	0
Flowback or Completions	0	0	0	0	0	0	0
Loadout	0	0	0.04	0.18	0.06	0.13	0

Production Emissions

Complete the following chart based on the estimated full facility equipment emissions (in tons) for the Oil & Gas Location once the Oil & Gas Location has entered the production stage, for Criteria Pollutants. The table should be filled out based on ONE year of operation.

	NOx	CO	VOCs	Methane	Ethane	CO2	N2O
Stationary Engines or Turbines	0.93	8.03	0.43	0.01	0.034	237.67	0.0019
Process Heaters or Boilers	2	1.68	0.11	0.05	0.06	2406	0.04
Storage Tanks	0.06	0.25	0.43	0.82	0.37	132.39	0.0002
Dehydration Units	0	0	0	0	0	0	0
Pneumatic Pumps	0	0	0	0	0	0	0
Pneumatic Controllers	0	0	0	0	0	0	0
Separators	0	0	0	0	0	0	0
Fugitives			0.34	0.27	0.1	0.02	
Venting or Blowdowns	0	0	3.95	5.11	1.81	0.43	0
Combustion Control Devices	0	0.02	0.03	0.08	0.03	6.3	0
Loadout	0	0	0.5	0.93	0.42	1	0
Non-Road Internal Combustion Engines	0.1	0.07	0	0.0005	0	12.17	0.0001
Well Bradenhead	0	0	0.0026	0.0034	0.0012	0.0003	0
Well Maintenance	0	0	1.61	2.08	0.74	0.17	0

Cumulative Impacts Strategies

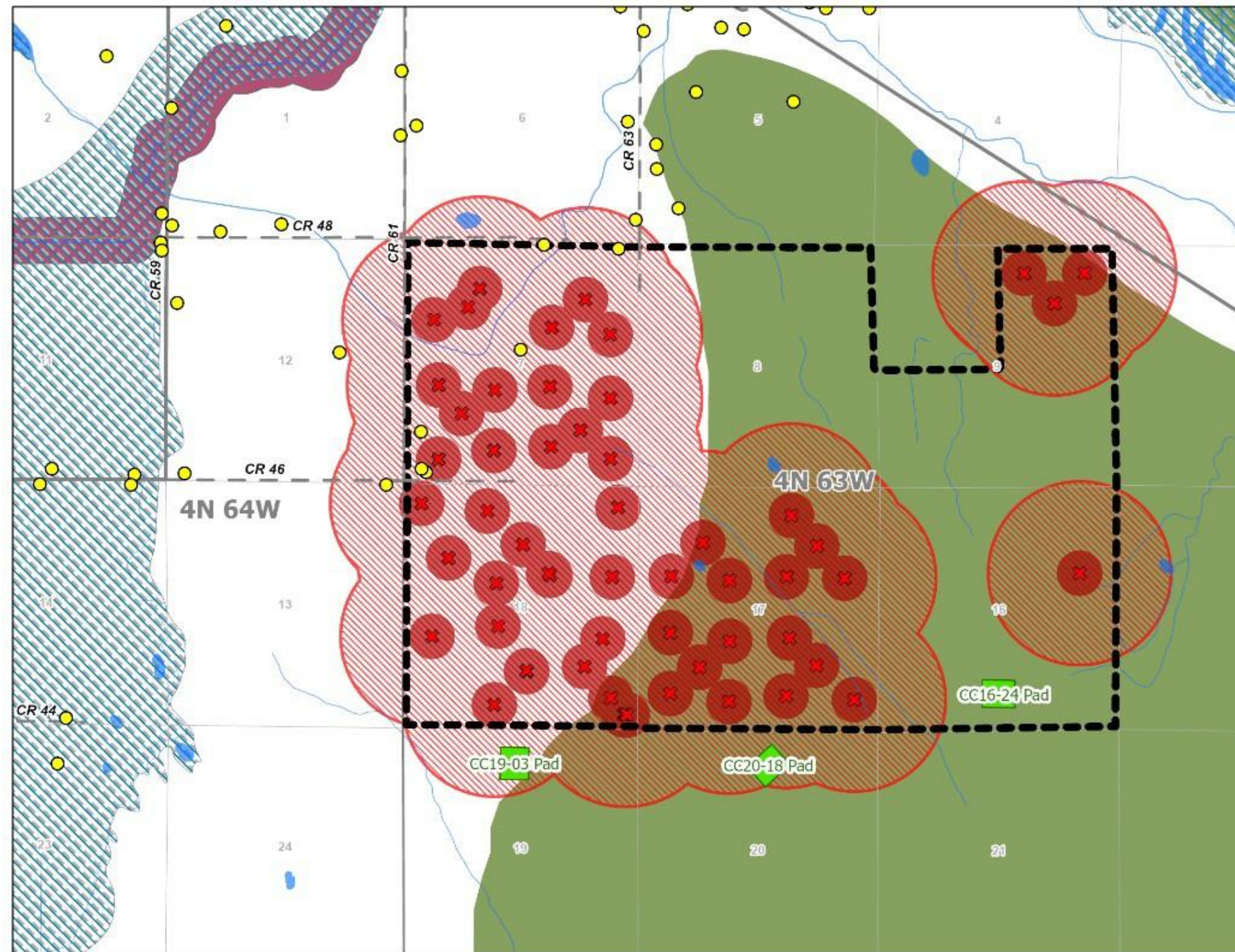
B. Individual Oil and Gas Development Plan (OGDP) Assessment and Analysis

CUMULATIVE IMPACTS PLAN

Rule 304.c.(19) Cumulative Impacts Plan - requires that operators submit a plan documenting how the Operator will address cumulative impacts. This plan includes

- A description of all resources to which cumulative adverse impacts are expected to be increased.
- Minimization Efforts: A description of specific measures taken to avoid or minimize cumulative adverse impacts
- Mitigation Efforts: A description of all measures taken to mitigate or offset cumulative adverse impacts
- Other Relevant Information, including “offsets”

Example: DP 452 OGDG Application (Noble)



Legend

DP Boundary	Legacy Wells	Water Feature/Wetlands
Pad Location	Legacy Wells Buffer 500ft	Floodplains (100-Year)
Address Point	Legacy Wells Buffer 2,000ft	CPW High Priority Habitat
	Paved Road	SB181 Protected Waters



- Development of this OGDG will result in the P&A of targeted **60** Wells and decommissioning of **16** Facilities – all are Noble operated
 - One-third of legacy locations are in HPH
 - One-third of legacy locations are within 2,000' of RBUs
 - Noble will plug and reclaim Wells and Locations outside of the mineral development area as well
- Prior to the completion of the first well, Noble will provide emissions reduction calculations, reclaimed land calculations and traffic reduction calculations within 12 months of approval of the OGDG
- Emissions and traffic associated with legacy development eliminated and new development will focus on reduction of emissions and elimination of truck traffic
- Consolidated production to an existing, electrified facility and moving to piping fluids as opposed to trucking them

ECMC Cumulative Strategies

C. Individual Oil and Gas Development Plan (OGDP) Assessment and Analysis

ANNUAL CUMULATIVE IMPACTS REPORT

Rule 904 Evaluating Cumulative Impacts - requires that the ECMC prepare an annual report (“the big picture”). This report includes but is not limited to

- Review of Cumulative Impacts Data Evaluation Repository (CIDER)
- Information from CDPHE on GHG emissions and roadmap
- Information about ozone attainment
- Innovative technologies
- Research
- Additional information requested by the Commission

Link: [2022 Cumulative Impacts Report](#)

CIDER Example - Air Quality

Figure 86: Pre-Production NOx Per Well

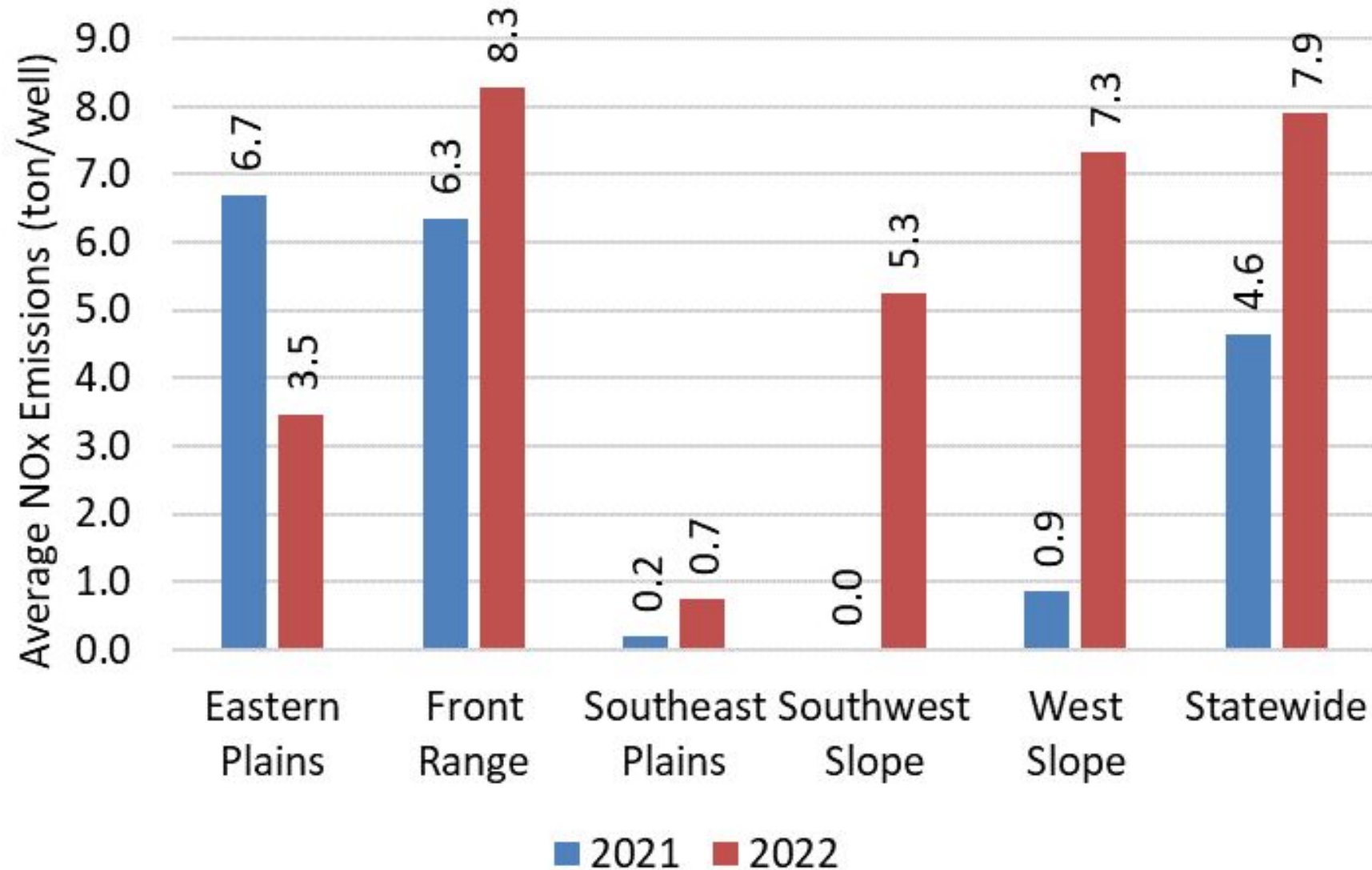
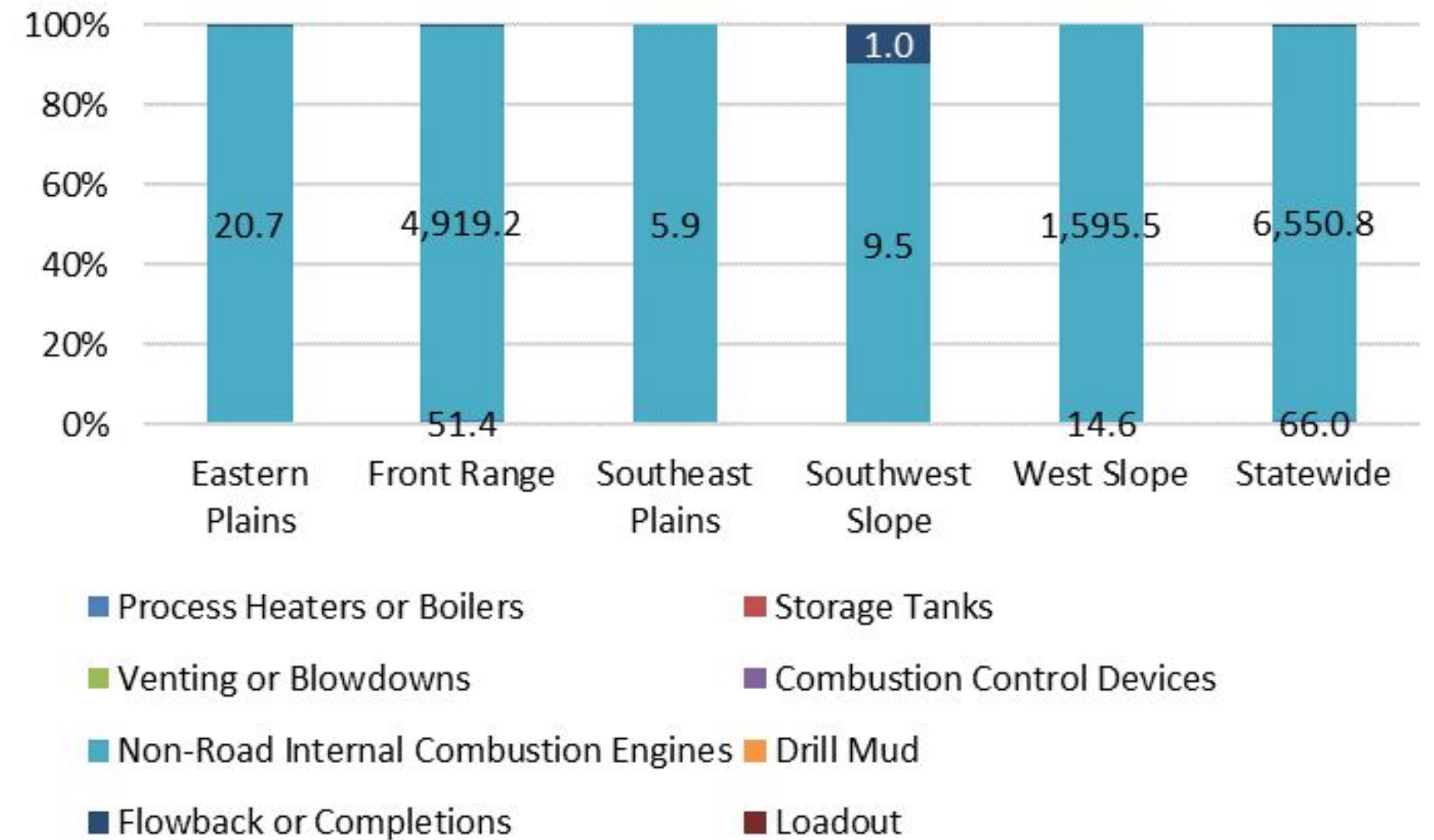


Figure 87: Pre-Production NOx Source Distribution (ton)



The figures on this slide come from the 2022 Cumulative Impacts Report.

CIDER Example - Air Quality

Figure 88: Pre-Production VOC Per Well

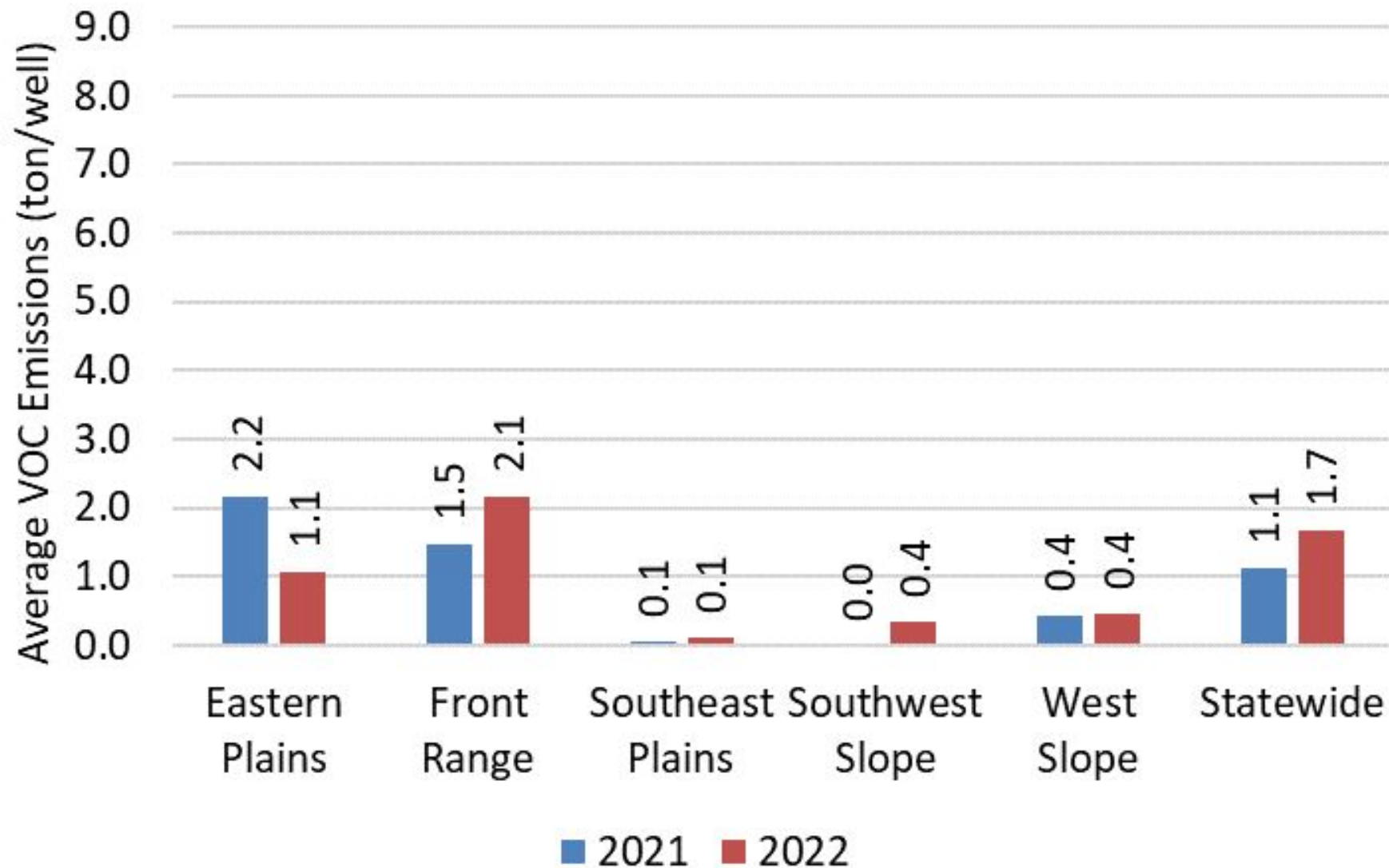
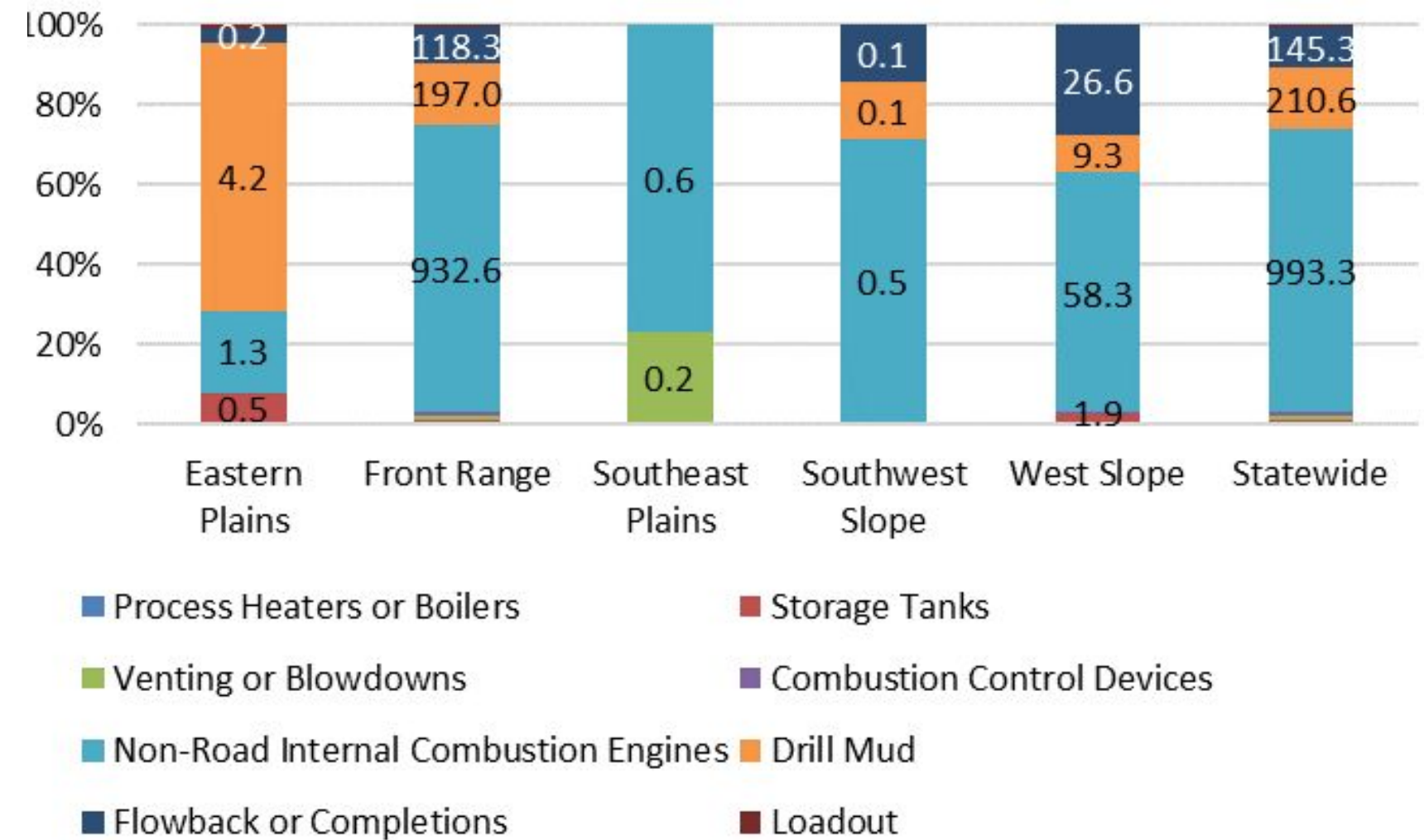


Figure 89: Pre-Production VOC Source Distribution (ton)



The figures on this slide come from the 2022 Cumulative Impacts Report.

CIDER Example - Air Quality

Figure 94: Production NOx Emissions Per Well

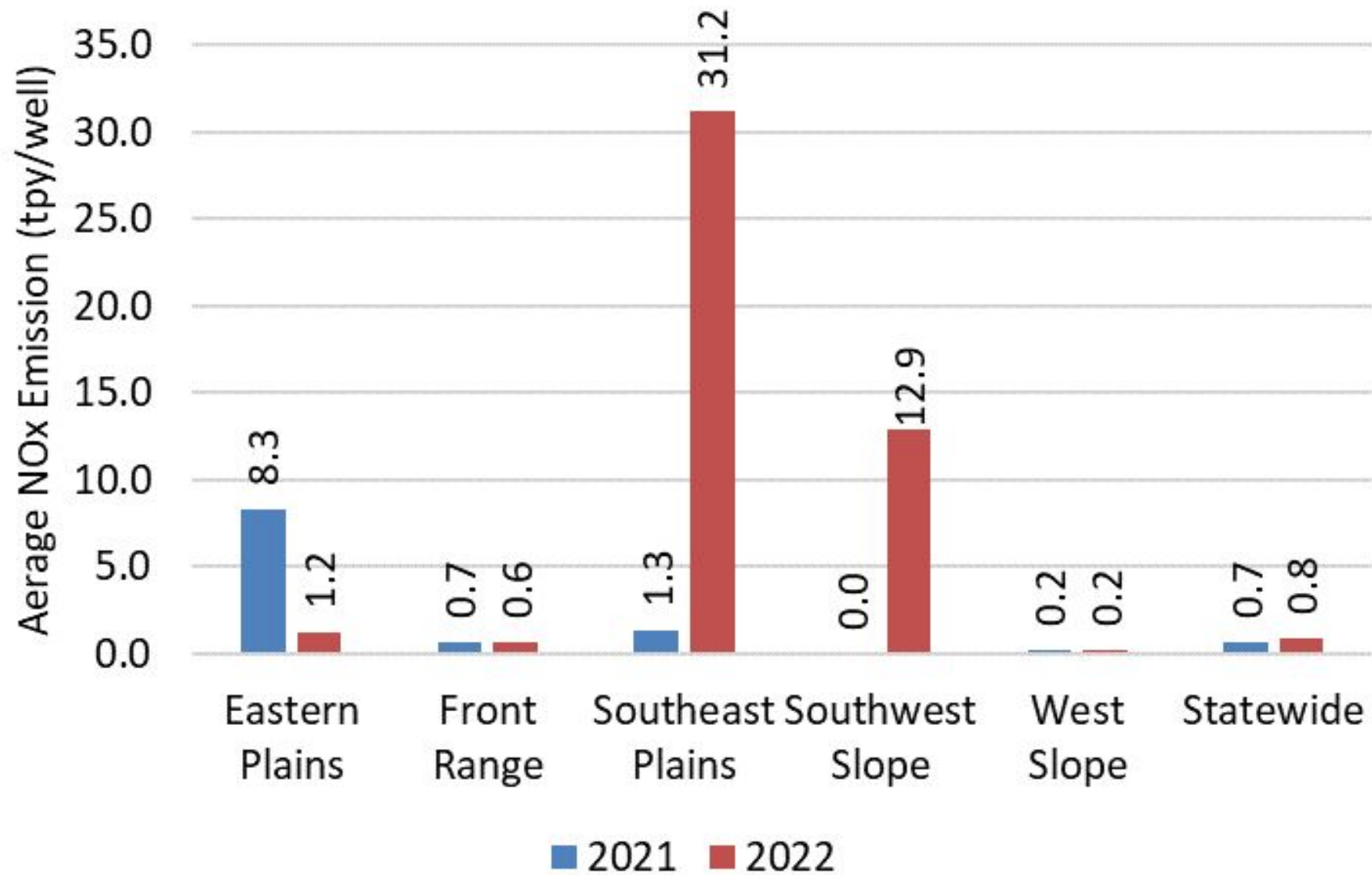
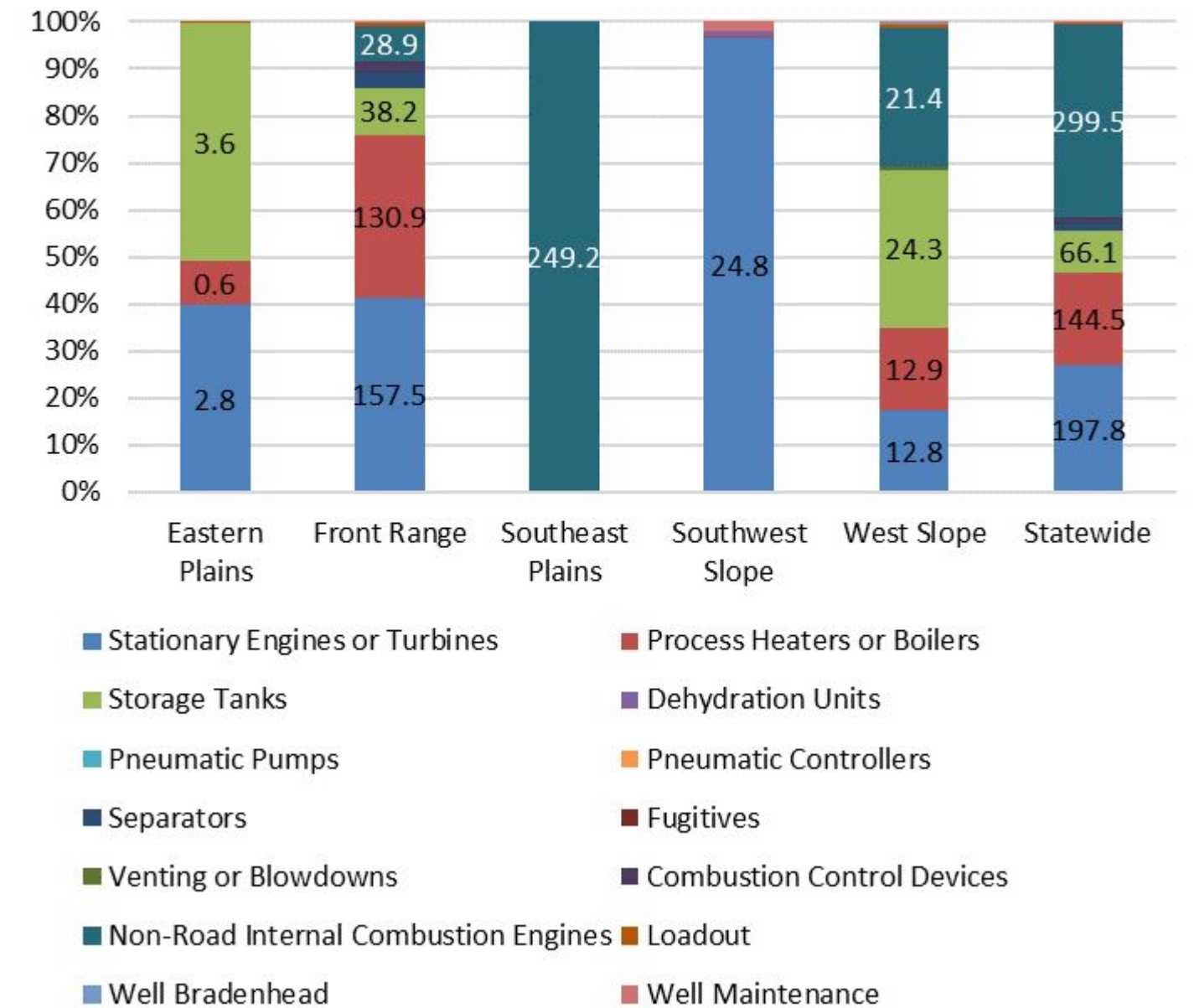


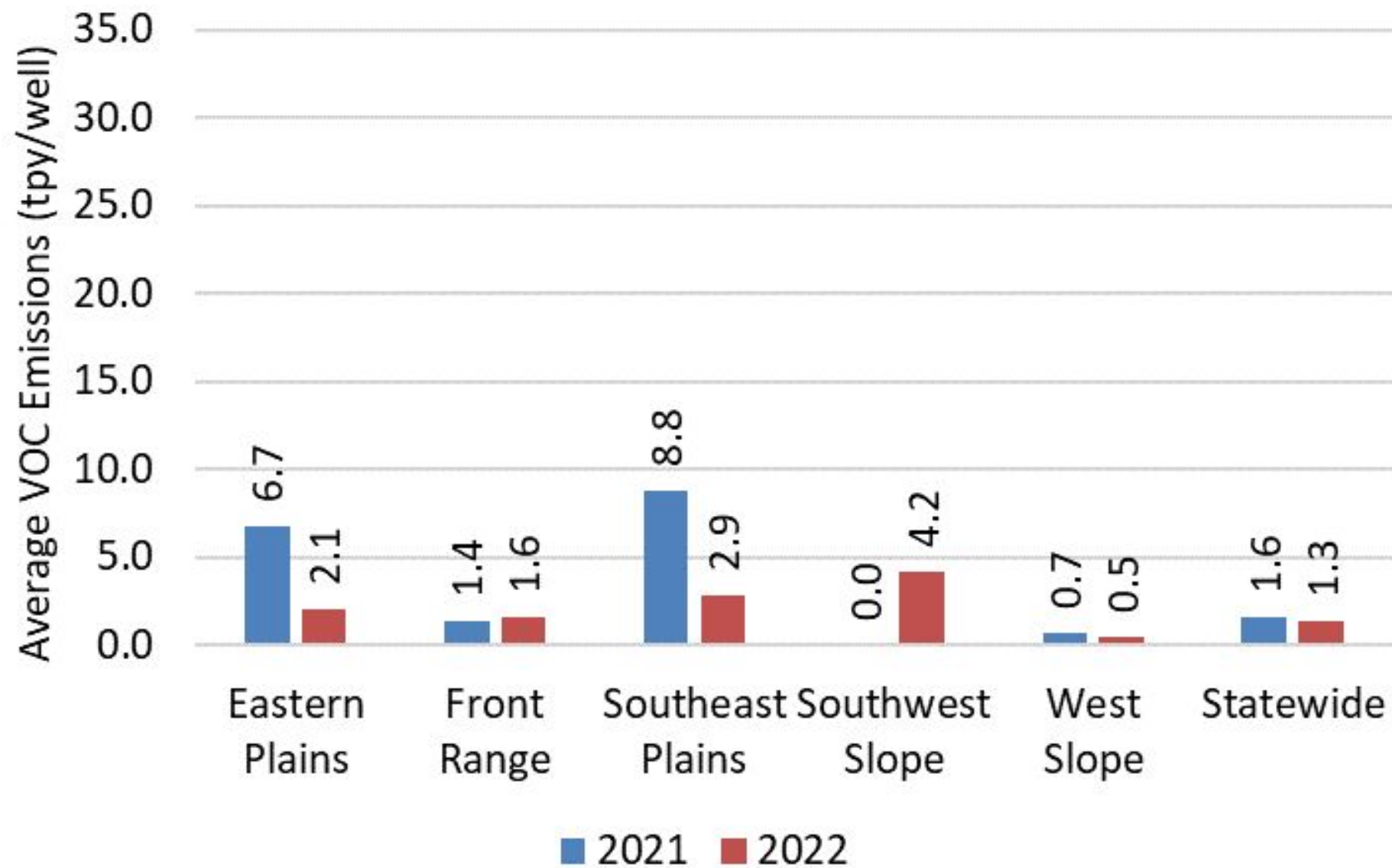
Figure 95: Production NOx Source Distribution (tpy)



The figures on this slide come from the 2022 Cumulative Impacts Report.

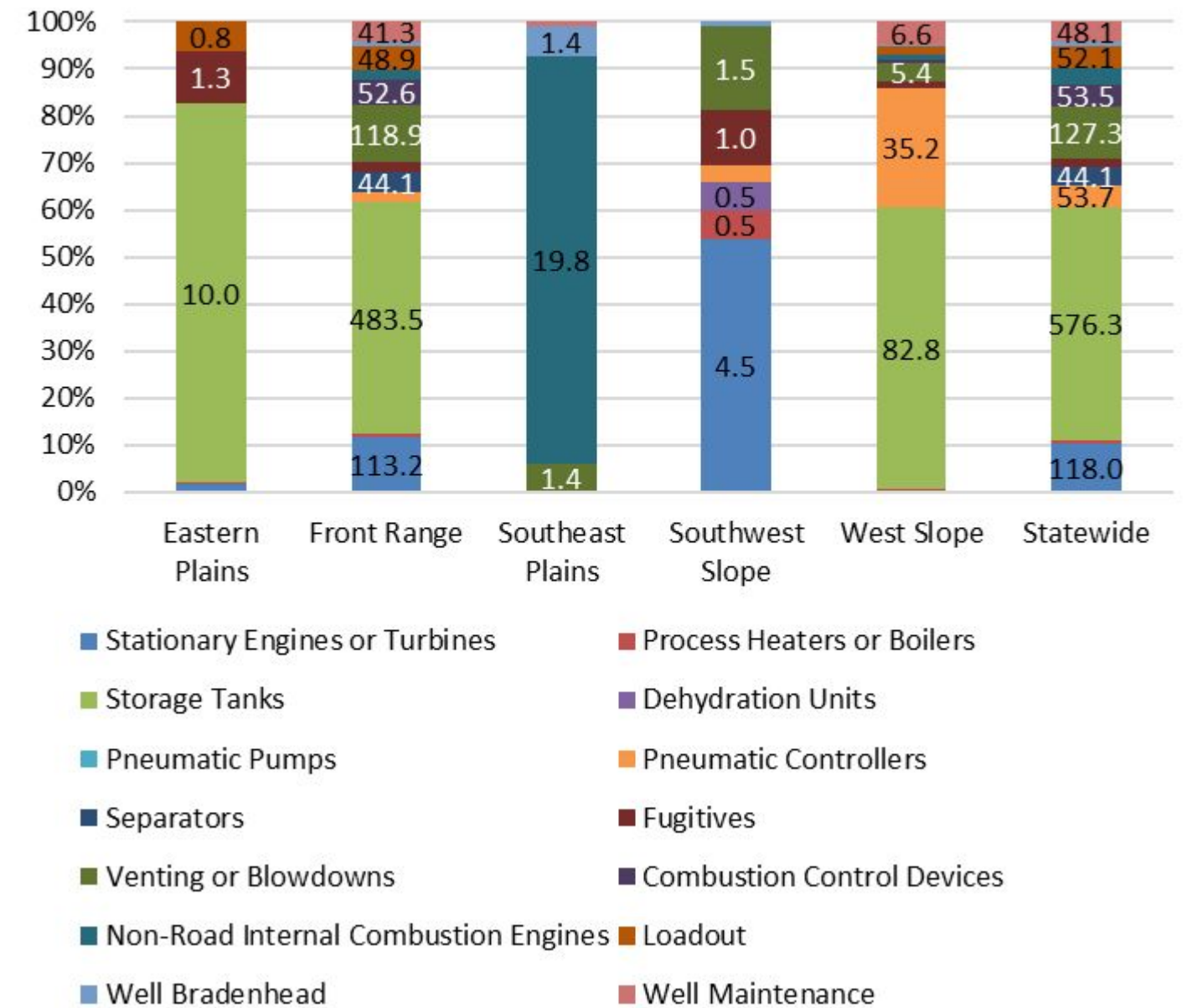
CIDER Example - Air Quality

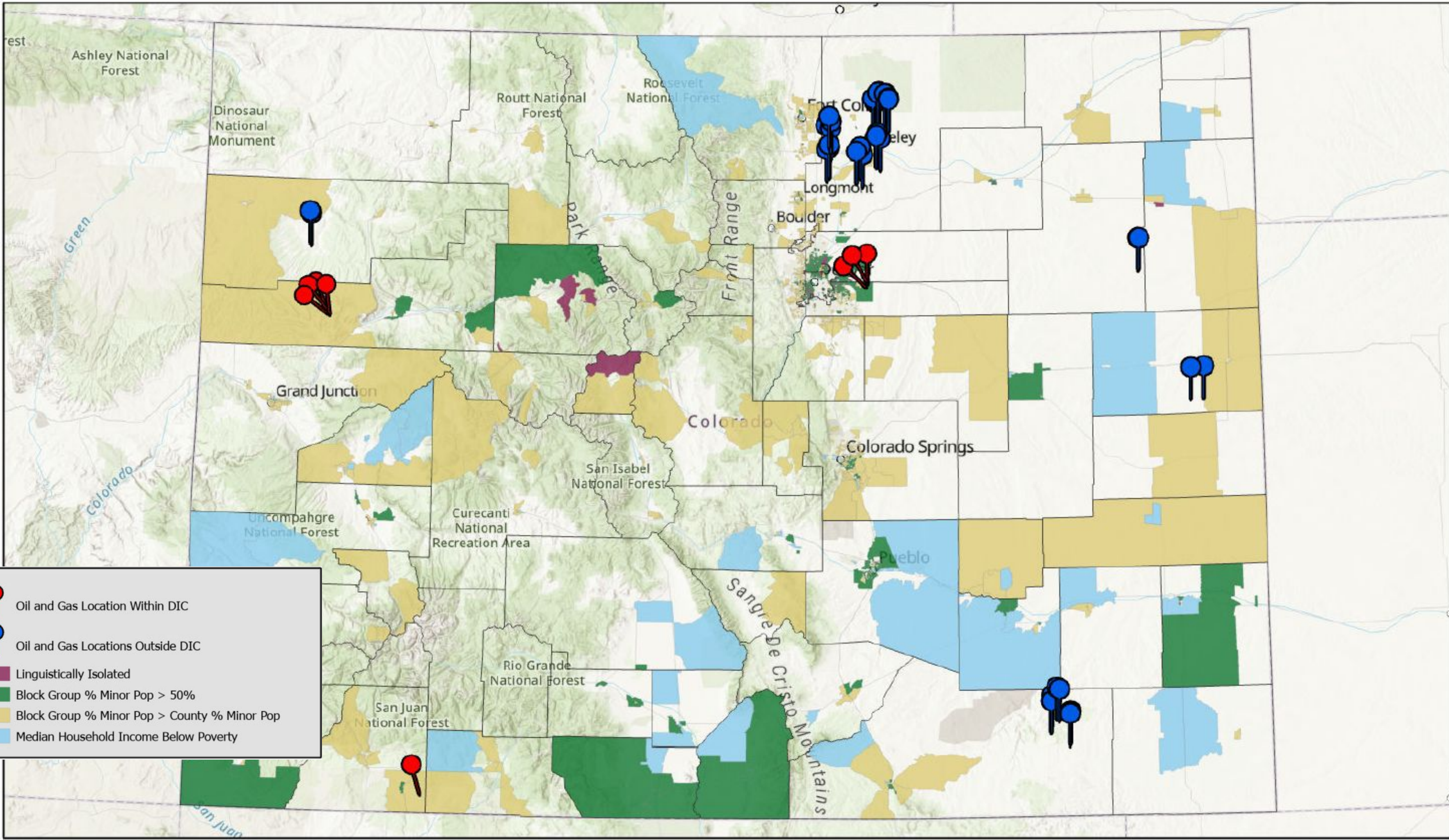
Figure 96: Production VOC Emissions Per Well









The figures on this slide come from the 2022 Cumulative Impacts Report.

Figure 97: Production VOC Source Distribution (tpy)

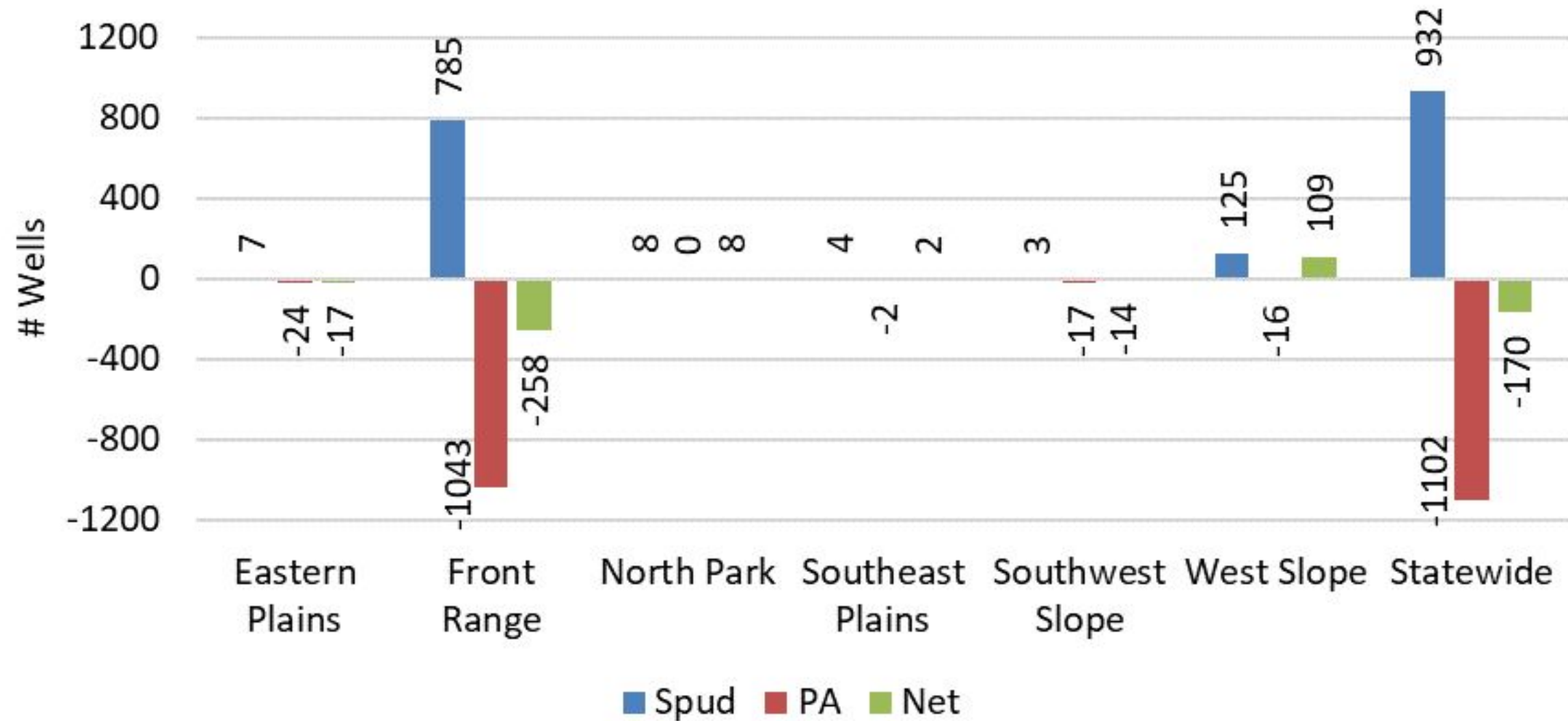




-  Oil and Gas Location Within DIC
-  Oil and Gas Locations Outside DIC
-  Linguistically Isolated
-  Block Group % Minor Pop > 50%
-  Block Group % Minor Pop > County % Minor Pop
-  Median Household Income Below Poverty

CIDER Example, Commission Request - Well Information

Figure 114: 2022 Spud, PA, Net Well County by Operating Area



The figures on this slide come from the 2022 Cumulative Impacts Report.

Cumulative Impacts Report Agency Coordination

The annual cumulative impacts report includes information prepared in collaboration with other Colorado state agencies including, but not limited to:

CDPHE APCD:

- Greenhouse gas inventory
- Oil and gas emissions inventory
- Ozone season report and updates
- Aerial and ground-based surveys
- Share relevant published research

CEO:

- Greenhouse gas roadmap

CPW

- Consult on wildlife data
- Compensatory mitigation

Cumulative Impacts Rules Update Process To Date



Themes From Informational Docket

- Update definitions for cumulative impacts and disproportionately impacted communities
- Improve Processes that Evaluate and Address Impacts
- Consider thresholds/carrying capacity/allocation limits
- Continue to improve collaboration with sister agencies
- Improve verification processes and link achievement of goals to ECMC processes

Cumulative Impacts Rules Update Process Moving Forward



Questions/Discussion

Visit our website:

ecmc.state.co.us



COLORADO

**Energy & Carbon Management
Commission**

Department of Natural Resources

Colorado Department of Public Health & Environment - ECMC Consultation Process

Legislative Interim Committee on Ozone Air Quality

Tessa Sorensen, Energy Liaison

November 8, 2023



COLORADO
Department of Public
Health & Environment

General Oil & Gas Permitting Process

Generalized Process*

1. Local processes (City, County)
2. ECMC OGDP ←—— *CDPHE Consultation during Public Comment Period*
3. CDPHE/APCD

**Assuming non-Federal, non-Tribal lands*

Consultation by CDPHE is stipulated by SB 19-181 and under ECMC Rules 309.f and 314

CDPHE Consultation Triggers

- Default
 - Residential Building Units within 2,000 ft
 - In a Disproportionately Impacted Community
 - In a Cumulatively Impacted Community

- Common reasons beyond default to require a consult
 - RBUs outside but very close to radius
 - Surrounding industry and population
 - EnviroScreen identifiers

Declined Consult Example: TEP Ryan Gulch OGDGP



Rio Blanco County

Within
Disproportionately
Impacted
Community

Extremely Isolated

Required Consult Example: Verdad Boydston 3535 OGDGP



Weld County

Not within DI Community

No Residential Building
Units within 2,000 ft...

**but nearest was ~2,020
feet, so consultation
requested**

CDPHE Consultation Frequency

- Since July 1 2023, CDPHE has required consultations for 20 of 31 opportunities
- 20 consultations completed or in progress:
 - 19 in Ozone Nonattainment Area
 - 13 have Residential Building Units within 2,000 ft
 - 14 are in Disproportionately Impacted Communities
- Frequency of instances where consultations are required solely depends upon locations of proposed OGDs at the time

ECMC 2023 Report on Evaluation of Cumulative Impacts

Figure 87: Pre-Production NOx Source Distribution (ton)

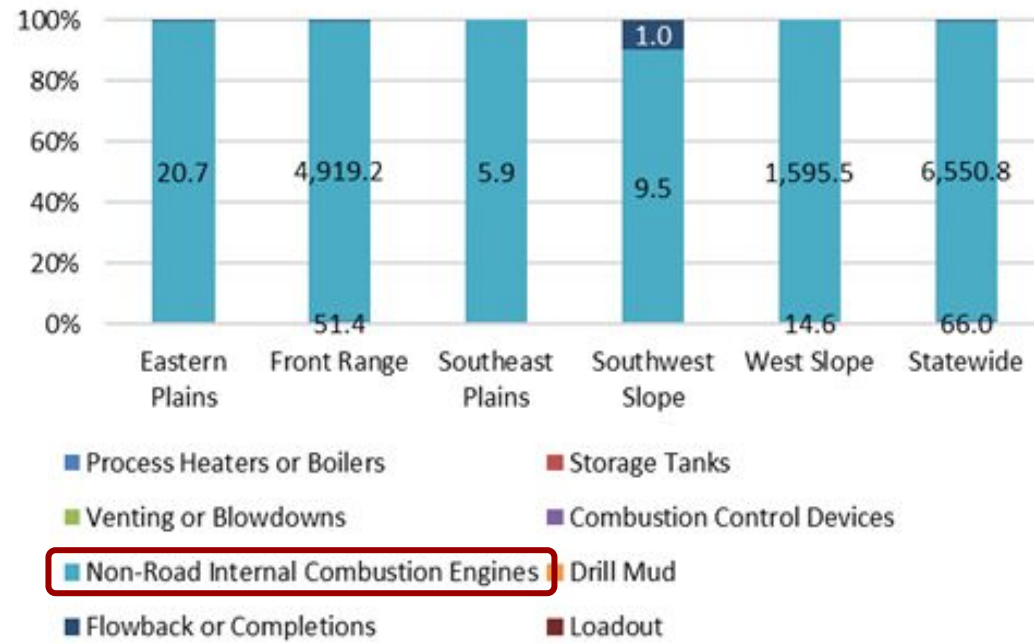


Figure 89: Pre-Production VOC Source Distribution (ton)

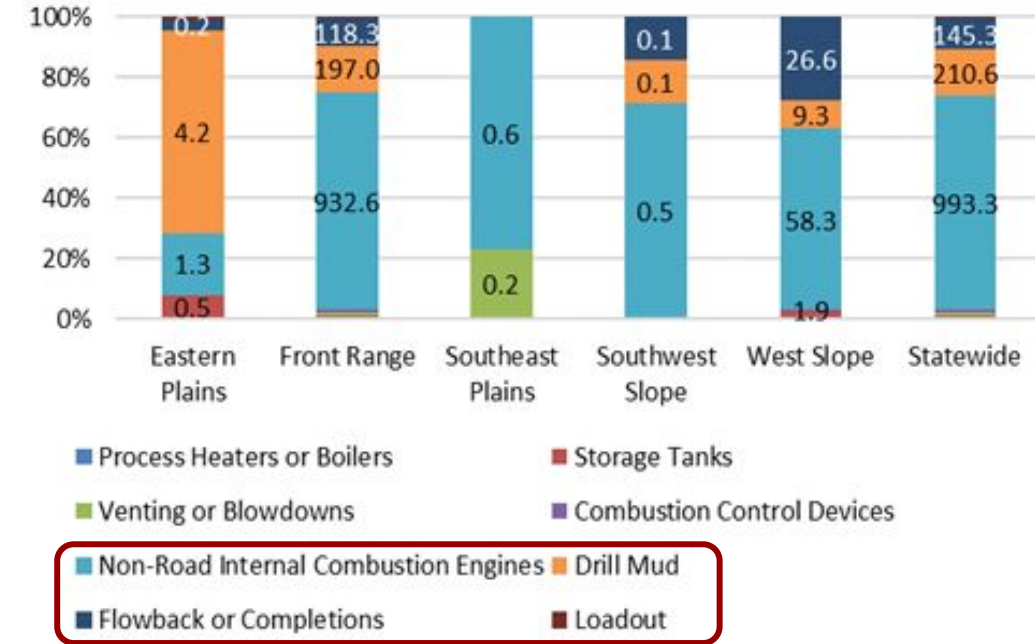


Figure 91: Pre-Production CH4 Source Distribution (ton)

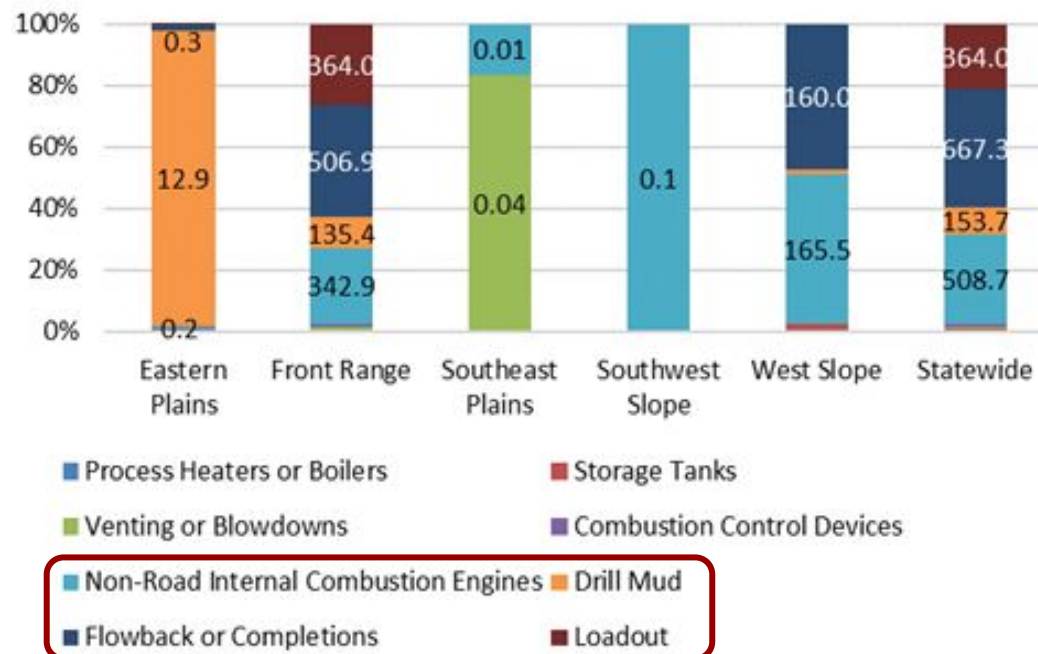
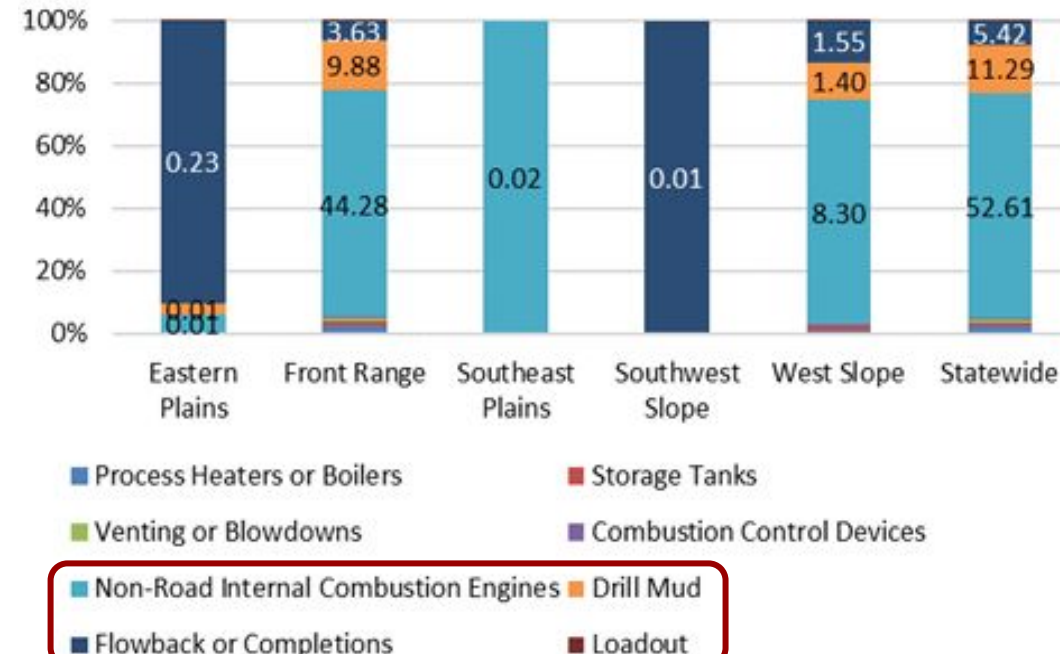


Figure 93: Pre-Production HAP Source Distribution (ton)



CDPHE O&G Best Management Practices (BMPs)

- Foundation of consultation meetings
- Consultations are not limited only to BMPs, or to 2,000 ft radius
- Environmental Justice concerns often included

Major Commitments Requested:

- Non-emitting pneumatics (using air, not natural gas)
- Grid-electrical powered drilling rigs and production facilities
- Low emission engines for all non-electrified equipment
(Diesel Tier IV, Natural Gas, etc.)
- Tankless facility design
- Pipelines (instead of trucking)
- Low aromatic (Polycyclic Aromatic Hydrocarbon) drilling fluids
- Reduction of operations on forecasted high ozone days

Consultation Example: Tier IV Engines

- Operator would not commit to full utilization of Tier IV engines in nonroad construction equipment or service fleet trucks prior to consultation
- After consultation, operator committed to $\geq 75\%$ of all nonroad construction and service fleet engines to be Tier IV
- Operator continues to audit contracted service companies, driving them to increased conversion of fleets to Tier IV engines



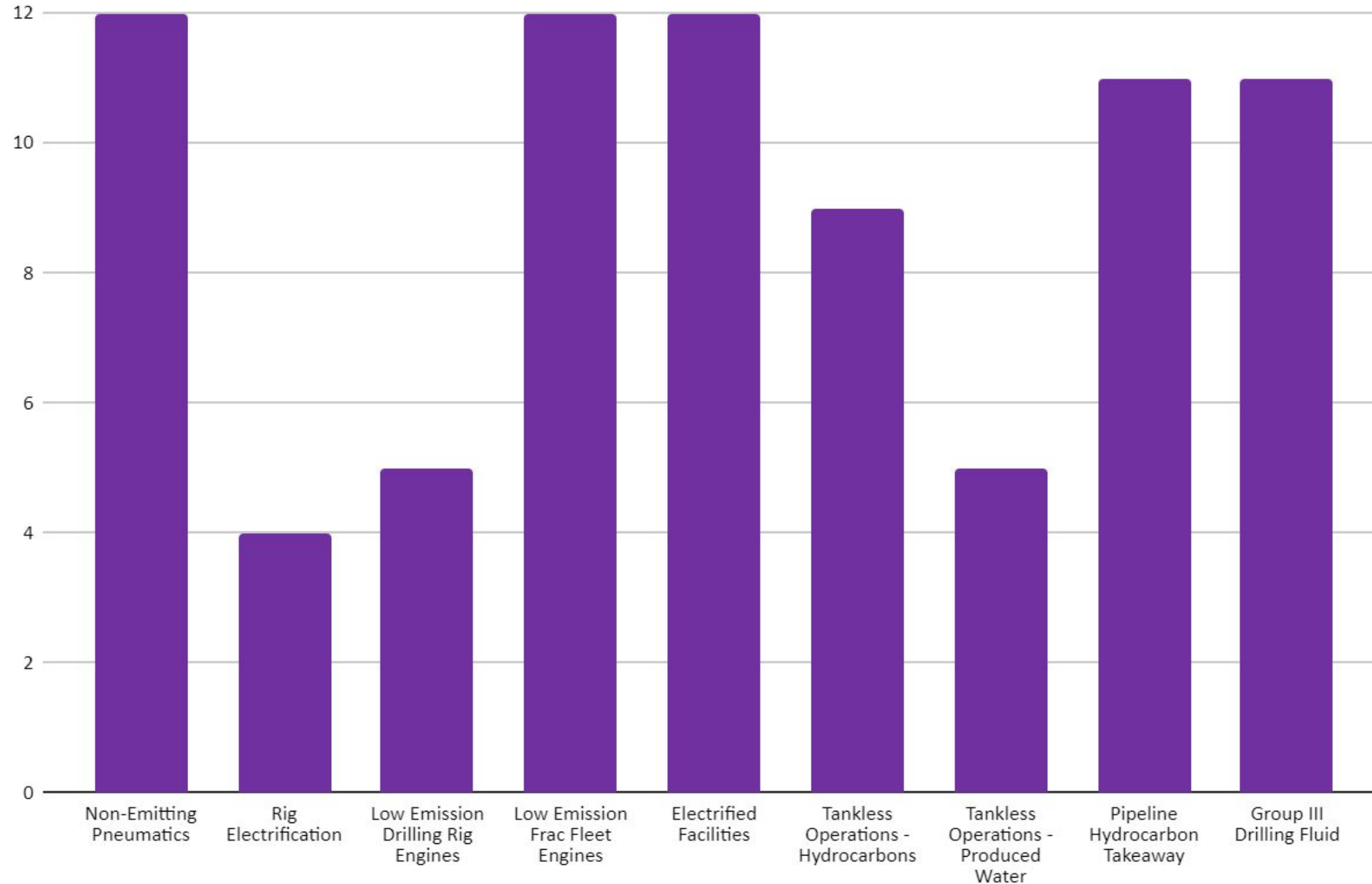
Consultation Example: Ozone and Air Monitoring

- Prior to consultation, operator would not commit to postponement of use of VOC paints/solvents, nor minimization of engine idling on forecasted high ozone action days...which changed after consultation with CDPHE
- Another operator proposed a site within one mile of heavily populated suburbs. After consultation, operator agreed to monitor air quality 6 months beyond required AQCC regulations and use of multiple types of air monitoring devices (instead of a single source)



Commitments from Consultations - Emissions

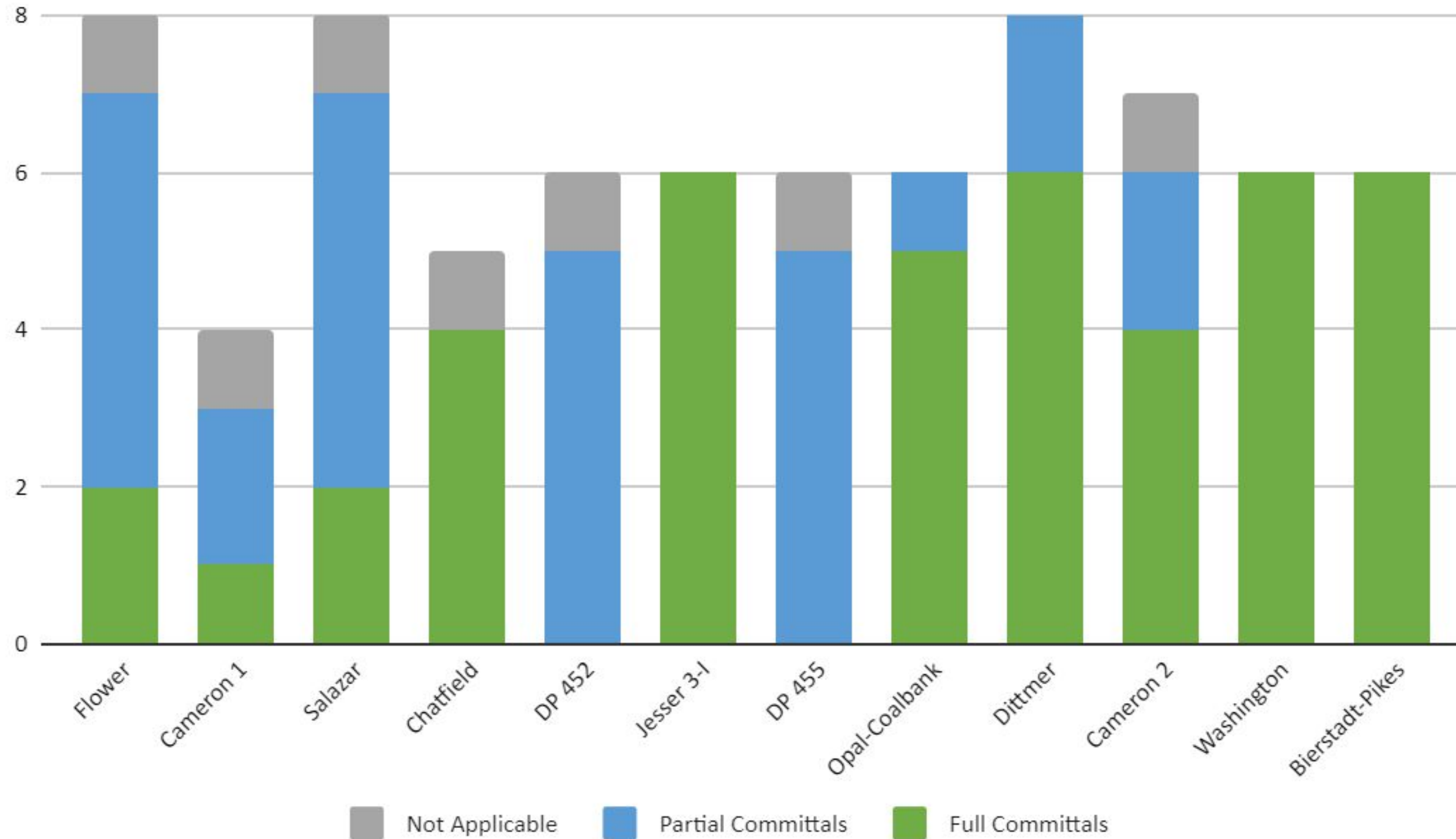
BMP Commitments by Category July-October 2023



Data from all twelve consultations performed from July 1 2023 to Oct. 31 2023

Commitments from Consultations - High Ozone Days

Forecasted High Ozone Days Commitments July-October 2023



Data from all twelve consultations performed from July 1 2023 to Oct. 31 2023

8 BMPs ask for postponement of operations on forecasted high ozone days

Each BMP relates to a different operation/activity

Questions/Discussion

Visit our website:

cdphe.colorado.gov



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**Department of Public
Health & Environment**