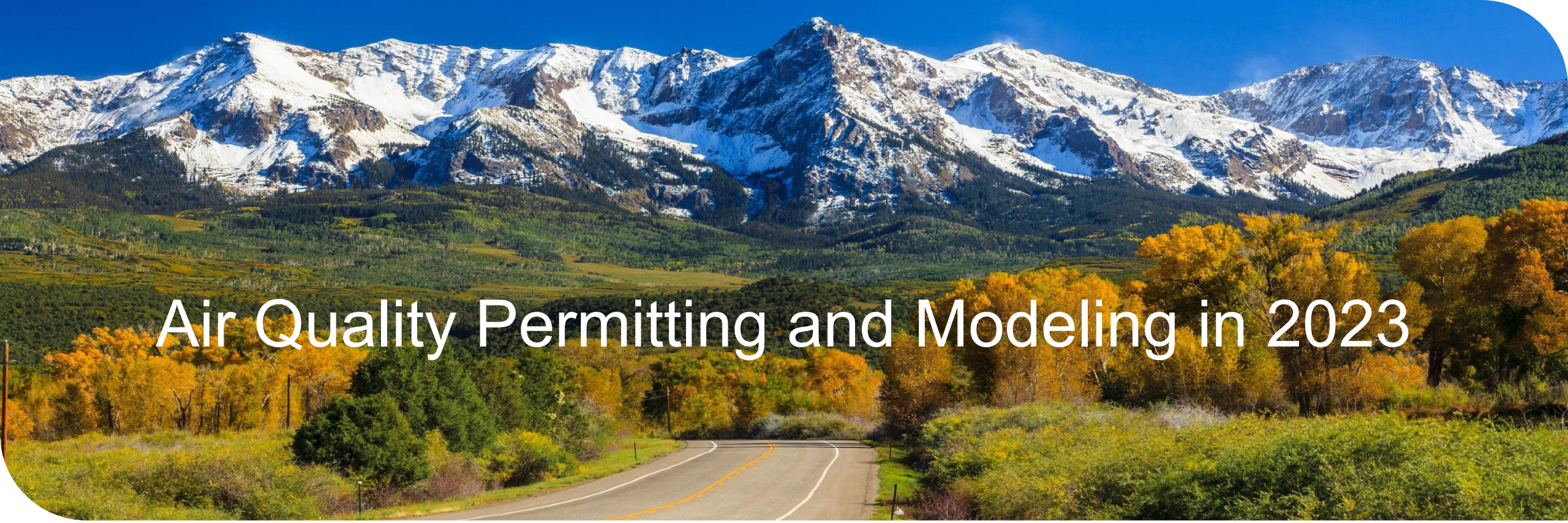

Air Quality Permitting and Modeling in 2023

Sergio Guerra - Deputy Director of Stationary Sources
Garry Kaufman - Deputy Director of Regulatory Affairs
Air Pollution Control Division

Legislative Interim Committee on Ozone Air Quality

September 22, 2023

COLORADO
Air Pollution Control Division
Department of Public Health & Environment

Outline

- Air Quality Permitting Process
- Air Quality Minor Sources
- NOx Modeling Results
- ECMC Permitting

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Introduction

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EPA Office of Inspector General Report - July 2022

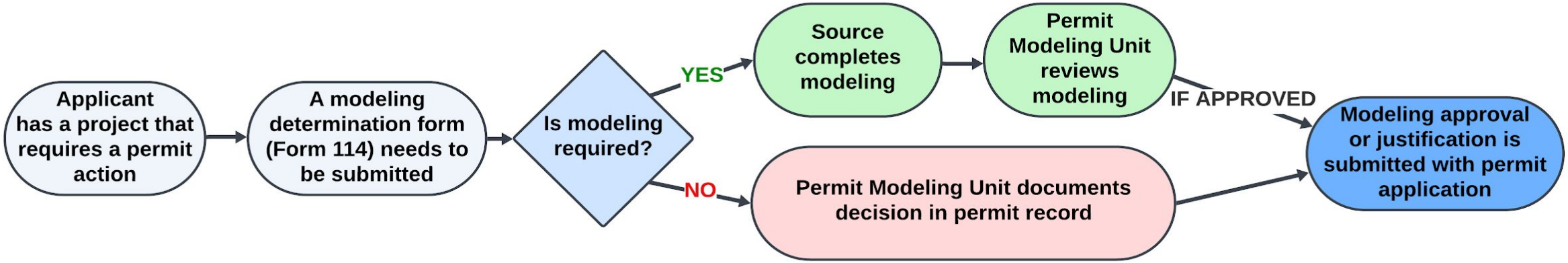
1. **Ensure that all future Minor NSR permit records are complete and properly document NAAQS compliance.**

CDPHE addressed the 6 recommendations from the EPA OIG Report in the October 2022 Response to the Regional Administrator.

Updated Procedures – Model Determinations

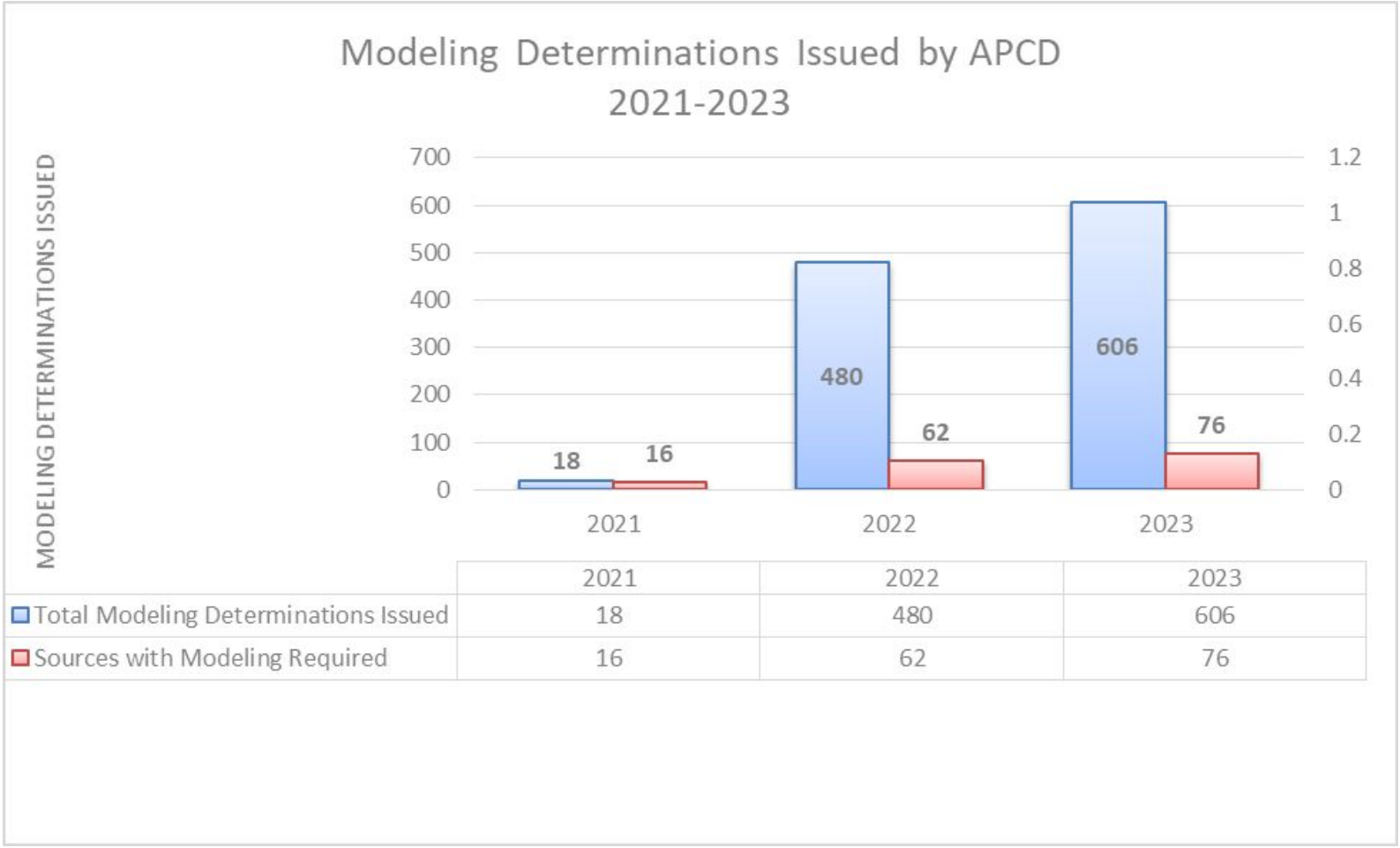
- The Modeling Determination form is to be used for applicants to receive a modeling determination **prior to submitting a permit application**.
  - All existing/submitted applications will be required to submit a model determination form.
  - All new applications will be required to submit a model determination form.
  - If the PMU determines that modeling is required, the modeling analysis should be submitted with the permit application for review.
- The Model Determination form will provide an applicant a qualitative determination by the Division of whether a modeling analysis is required or not. If a modeling analysis is not required, the Determination Form will contain clear justification for this determination. The Form and Determination will be a permanent part of the permit record.

New Modeling Determination Process



Modeling Determination (Form 114)

- Over **1,000** Form-114 determinations issued since September 2022.
- About 14% result in modeling being required.



	2021	2022	2023
Total Modeling Determinations Issued	18	480	606
Sources with Modeling Required	16	62	76

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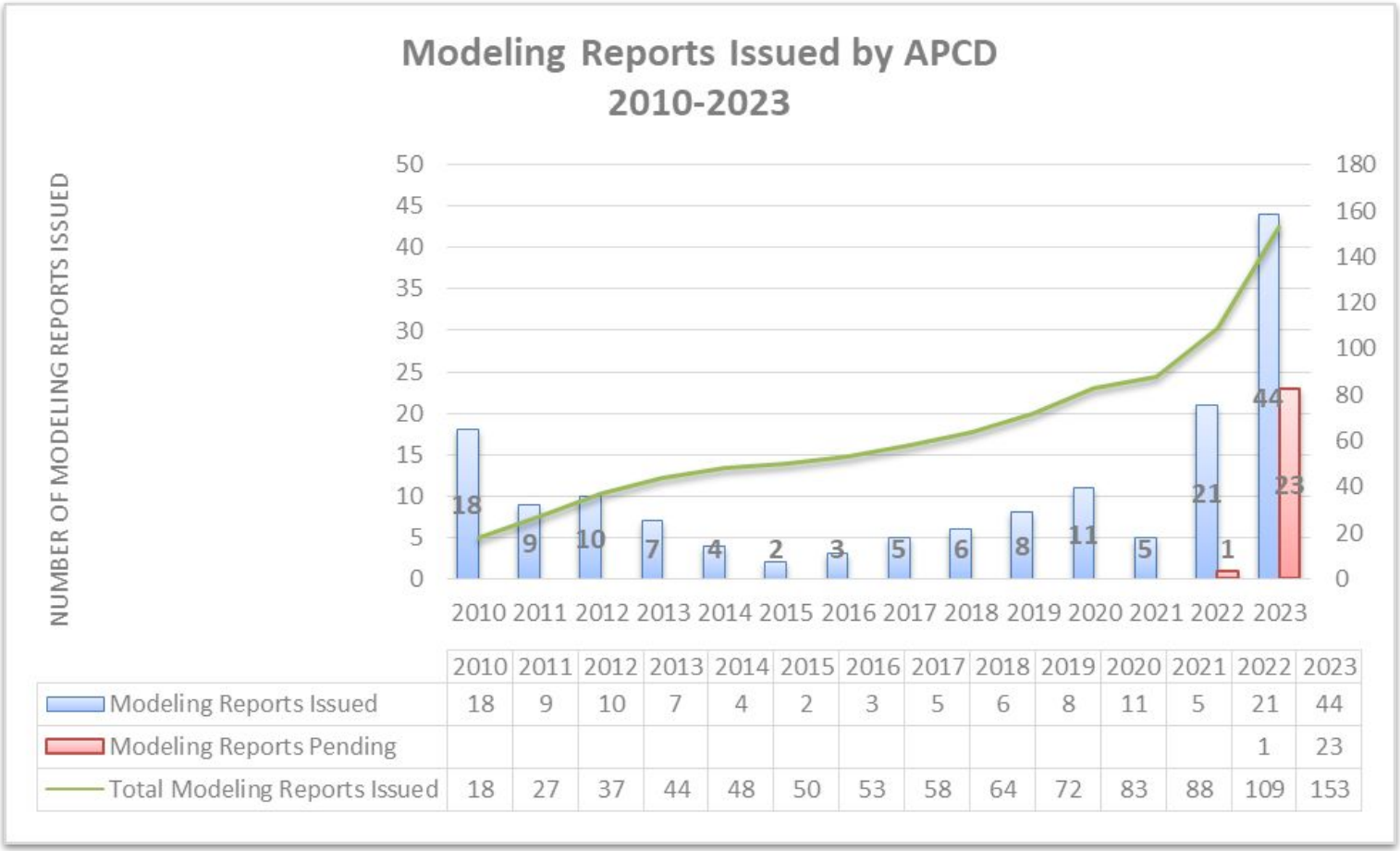
Modeling Reports Issued by APCD

- Significant increase started in 2022 with Form 114
- 2023 will be the highest year ever with about 67 reports issued



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Modeling Reports Issued	18	9	10	7	4	2	3	5	6	8	11	5	21	44
Modeling Reports Pending													1	23
Total Modeling Reports Issued	18	27	37	44	48	50	53	58	64	72	83	88	109	153

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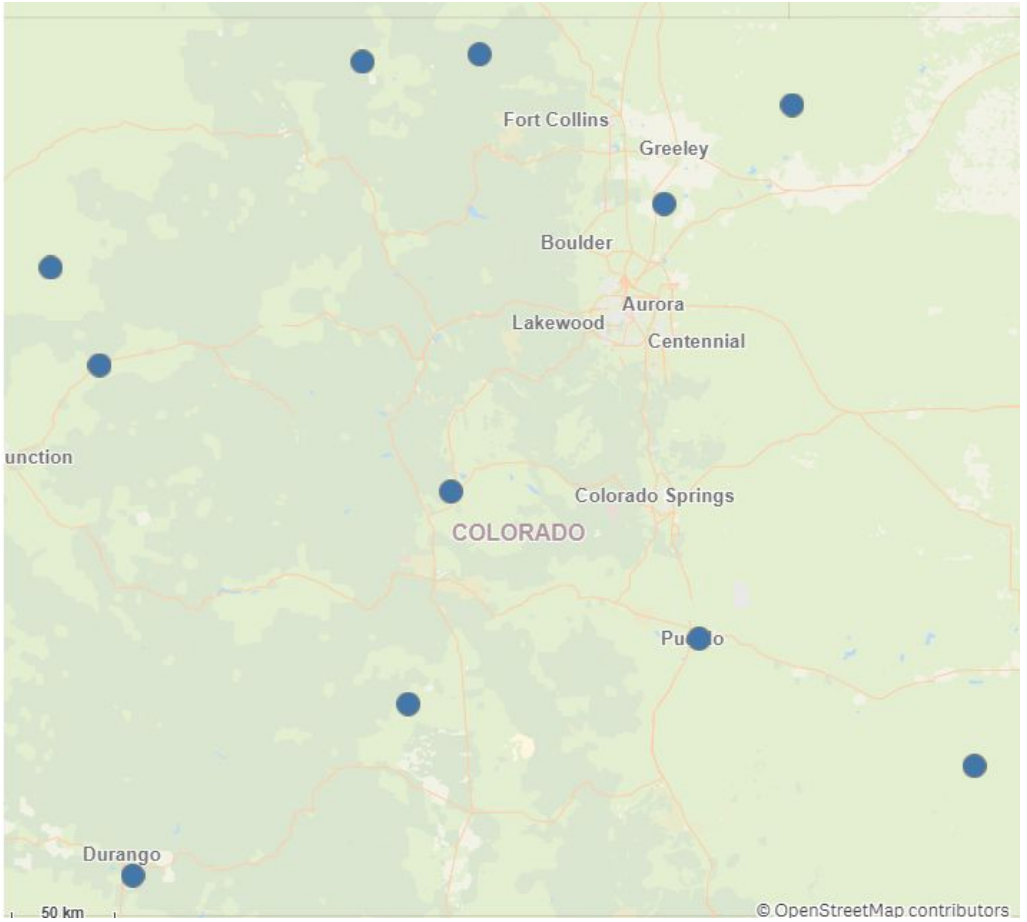
Ozone Assessment in the Permitting Process

- The APCD is currently requiring that sources with facility-wide emissions above 200 tpy of NOx evaluate secondary formation of ozone.
- Threshold is based on EPA's most conservative Modeled Emission Rates for Precursors (MERPs) multipliers for Colorado to determine a screening level above which the precursor pollutants could contribute to an exceedance of the ozone NAAQS as a result of secondary formation.
- MERPs are based on the photochemical modeling.



Sensitivity Results from NOx Modeling

- Sensitivity to a 30% NOx reduction from oil and gas production facilities during the 10 highest modeled ozone days in 2026

- NREL seems to have the lowest sensitivity to NOx reduction

Monitor	County	Minimum Ozone Benefit (ppb)	Maximum Ozone Benefit (ppb)
Fort Collins - West	Larimer	-0.1	-1.9
Rocky Flats North	Jefferson	-0.2	-1.2
NREL	Jefferson	+0.2	-0.4
Chatfield	Douglas	0.0	-0.5

Thank you!

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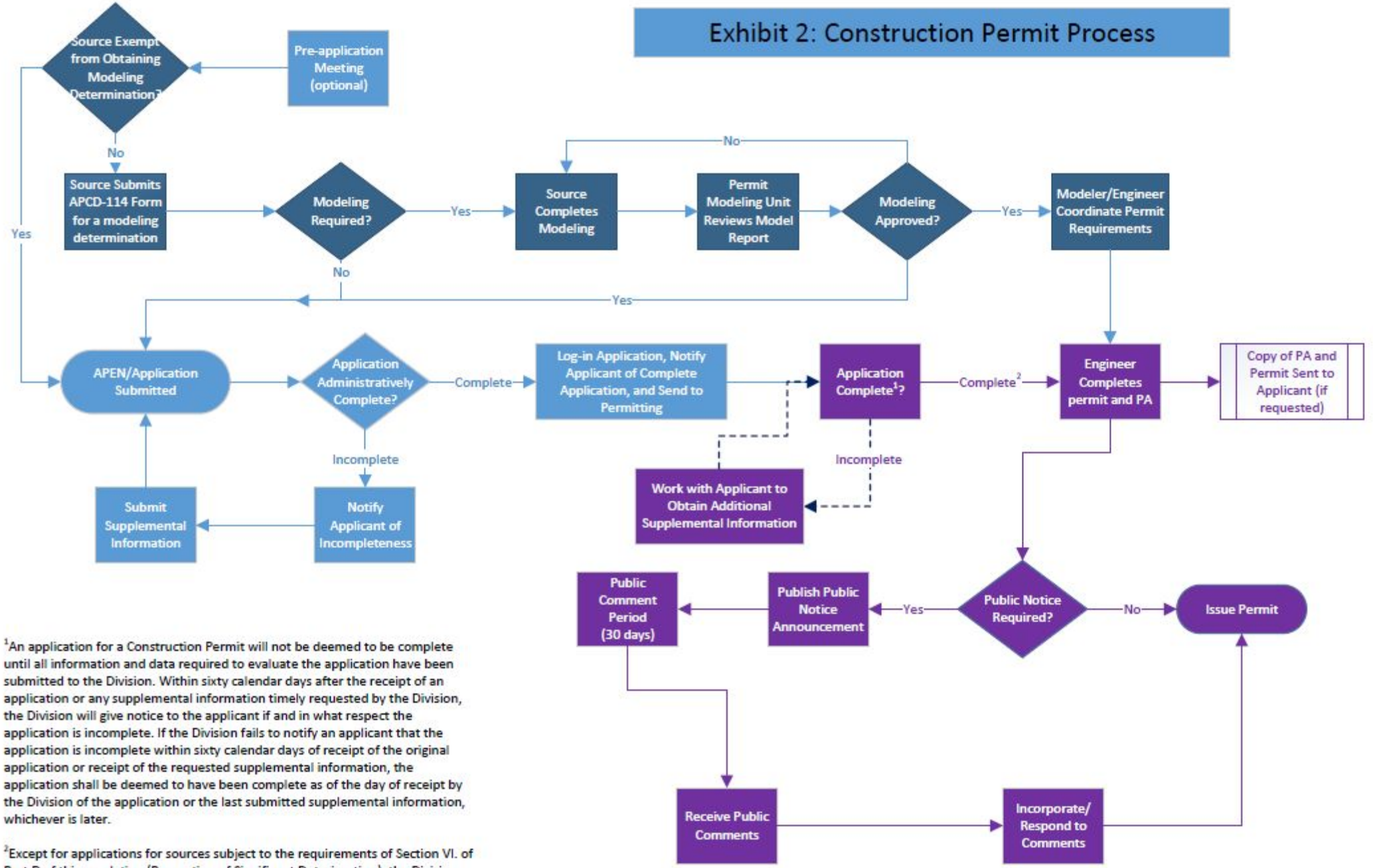
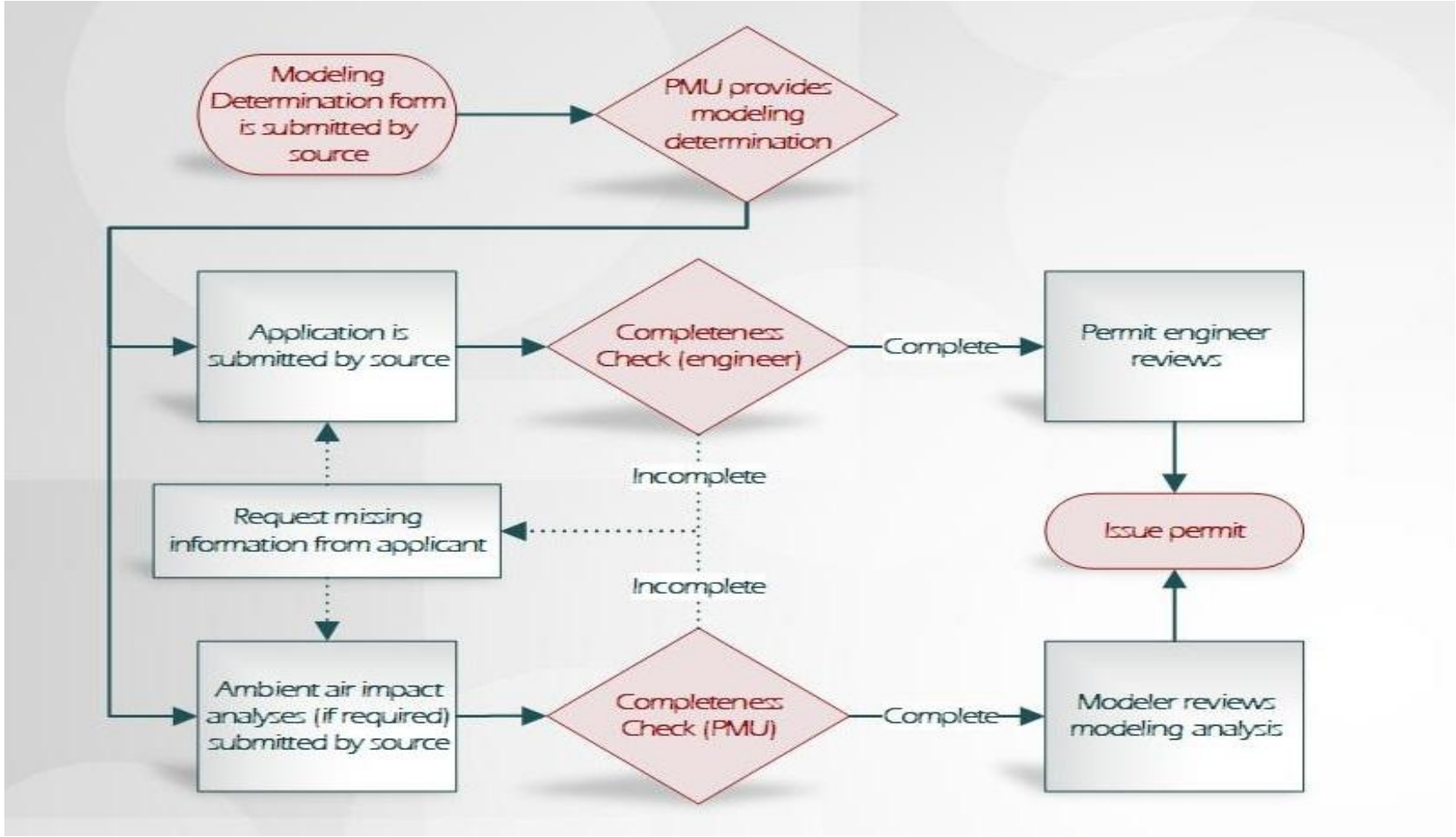
Exhibit 2: Construction Permit Process



[1]An application for a Construction Permit will not be deemed to be complete until all information and data required to evaluate the application have been submitted to the Division. Within sixty calendar days after the receipt of an application or any supplemental information timely requested by the Division, the Division will give notice to the applicant if and in what respect the application is incomplete. If the Division fails to notify an applicant that the application is incomplete within sixty calendar days of receipt of the original application or receipt of the requested supplemental information, the application shall be deemed to have been complete as of the day of receipt by the Division of the application or the last submitted supplemental information, whichever is later.

[2]Except for applications for sources subject to the requirements of Section VI. of Part D of this regulation (Prevention of Significant Deterioration), the Division shall prepare its preliminary analysis within sixty calendar days after receipt of a complete permit application.....

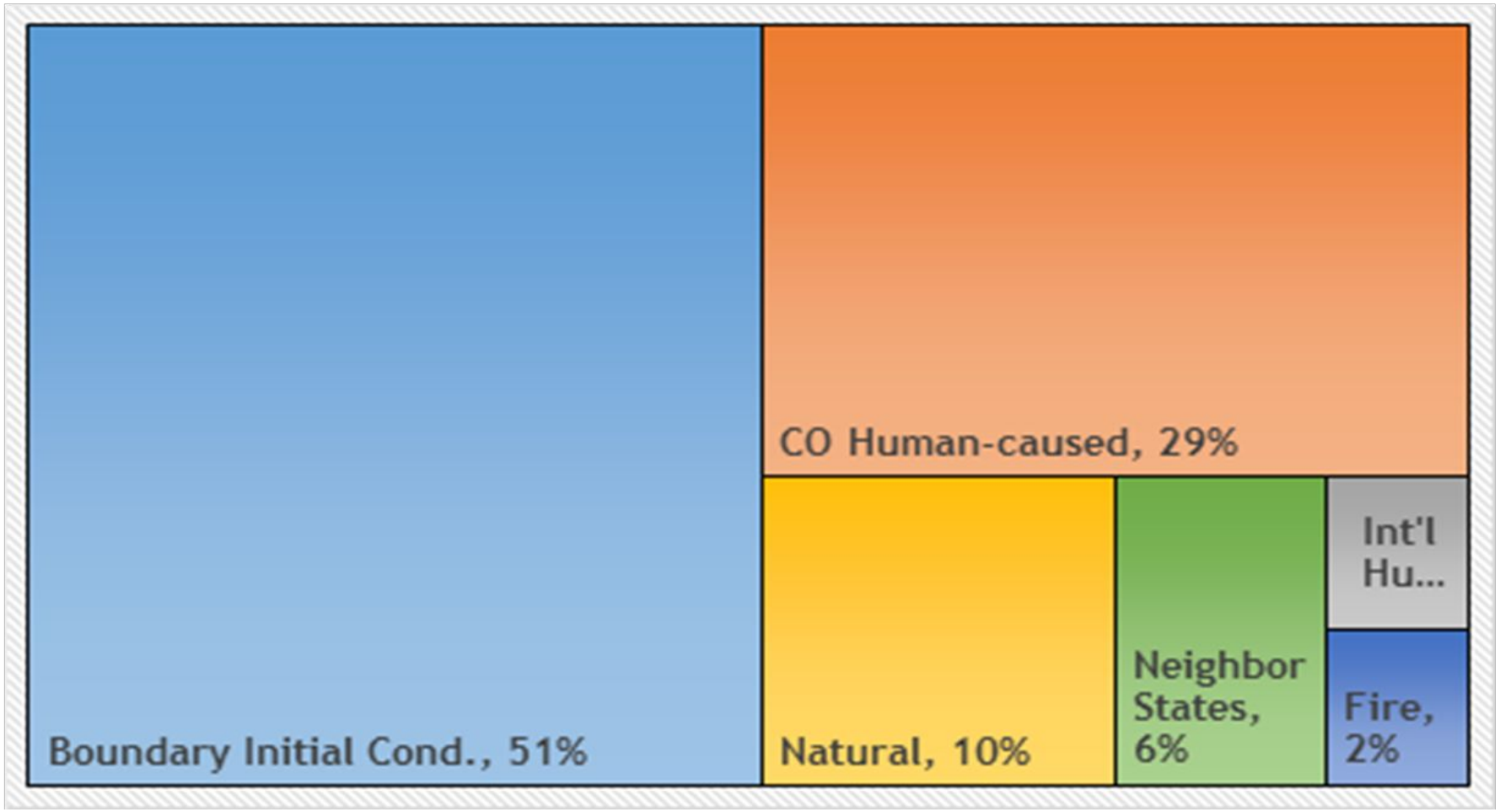
Permitting/Modeling Work Flow



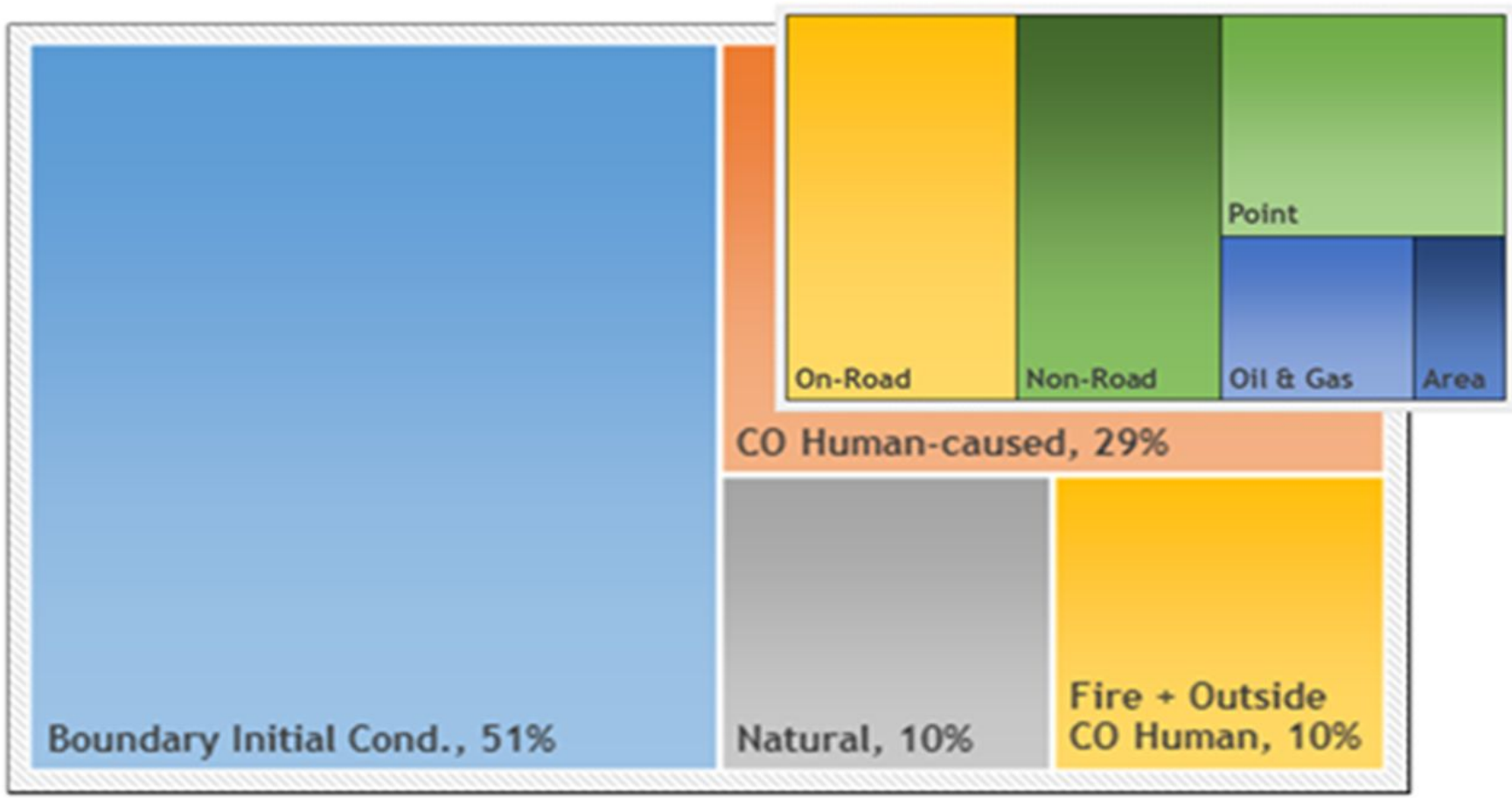
Permit Modeling – Administrative Process

- A final report is issued by PMU to the applicant and permit engineer with an evaluation and the conclusion of whether the permitted project will or will not cause or contribute to modeled violations of the applicable NAAQS.
  - If the modeling evaluation shows that the Project will cause violations of the applicable NAAQS, PMU will work with the applicant to identify modifications to the project that will support compliance with the NAAQS, and will accept a revised analysis to show compliance.

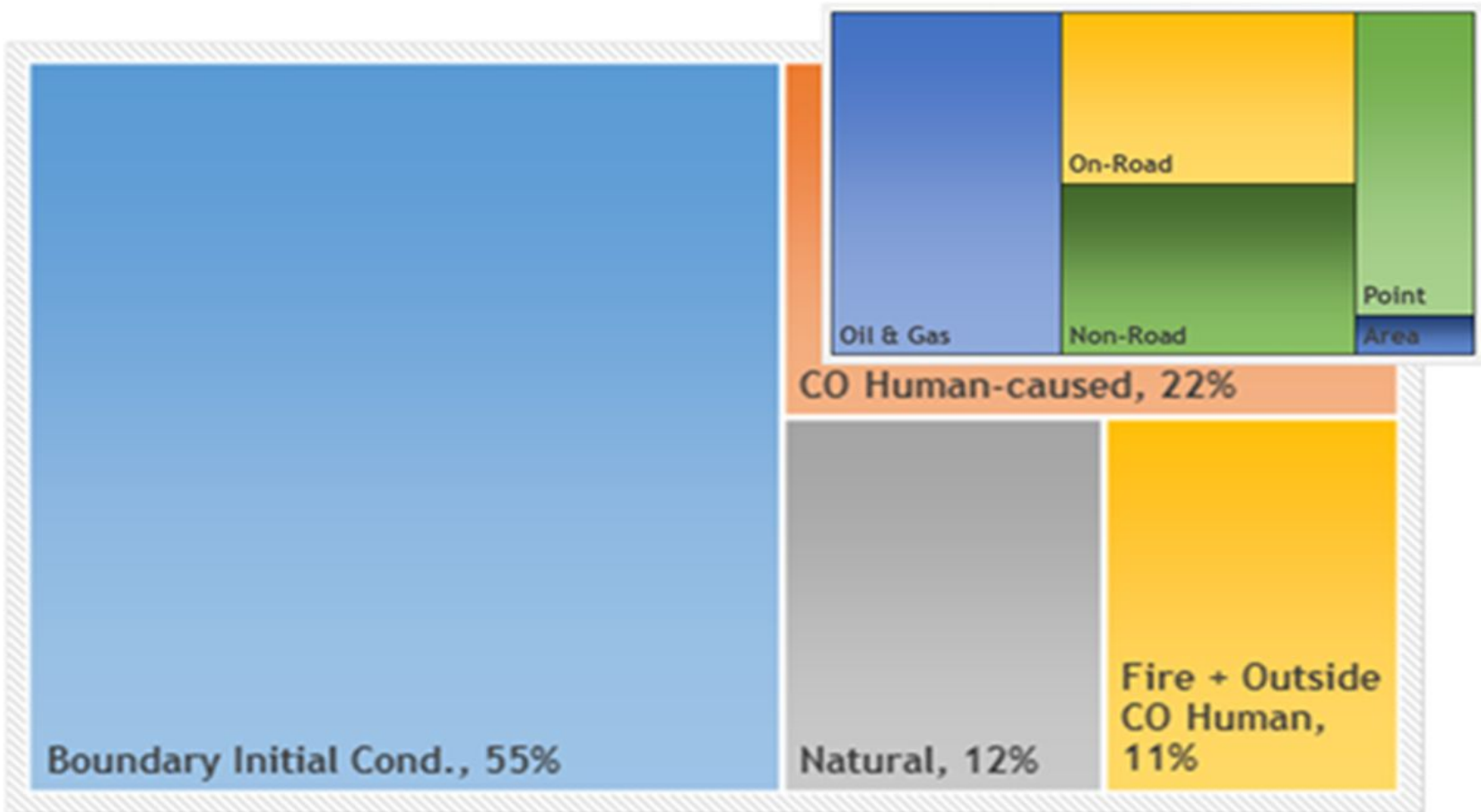
Average Contribution Across Monitors



National Renewable Energy Lab (NREL)

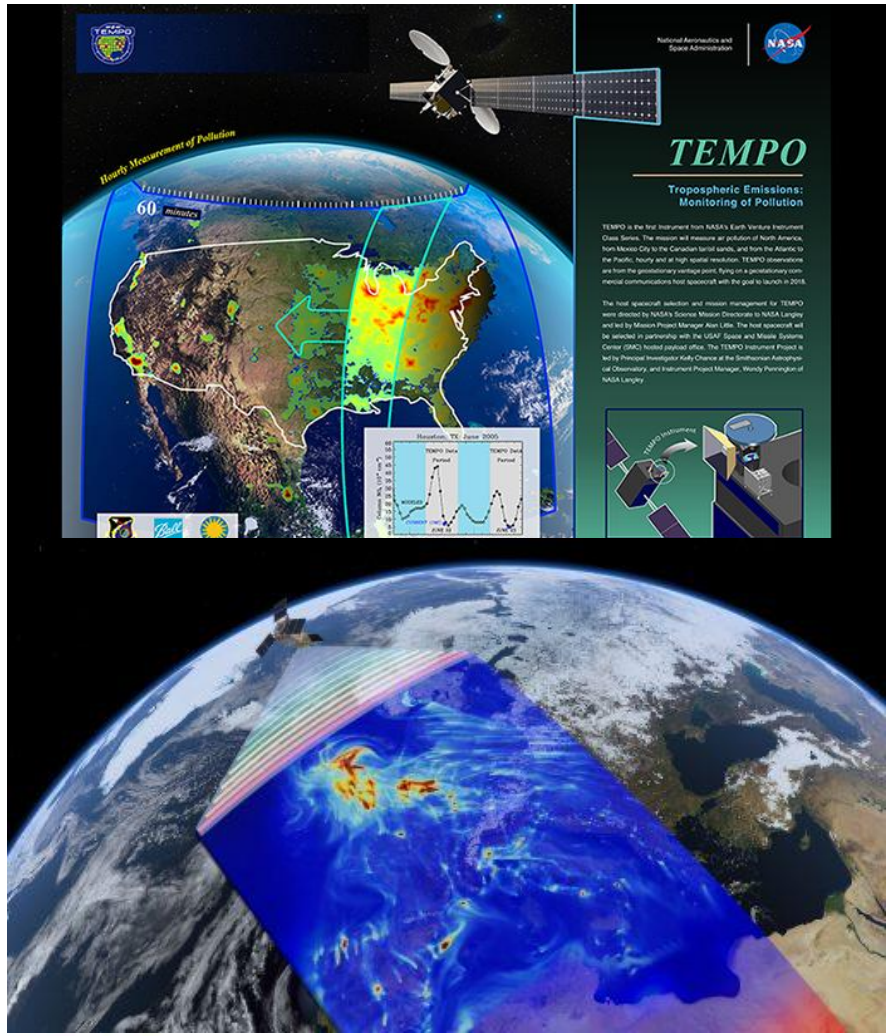


Fort Collins West (FCW)



Future Research

- The CDPHE has started evaluating the following research studies internally and externally to better inform our understanding of the existing air quality, as well as the potential for sources to impact the air quality in the future.
  - Conducting with NCAR a high resolution (~1 km) meteorological reanalysis of WRF data to create prognostic met data sets to be used in addition/instead of the limited and often not representative set of current meteorological observations. This study will be accompanied by careful evaluation to demonstrate it is an improvement as well as guidance of when/how it should be used.
  - Exploring with NCAR the possible use of remote sensing (satellite and drone technology) for emissions monitoring and evaluation.



Future Research

- Continued
  - Modeling studies to create Unit Impact Multiplier tables
  - Evaluate AERMOD's performance in Colorado using data that is available or can be obtained from Colorado's existing network of NO2 and meteorological monitors and Colorado's emissions inventory, particularly in regions of dense oil and gas
  - Conduct an air quality simulation with optimized emissions and meteorology (data assimilation of meteorological and chemical surface and satellite data and/or machine learning for blended product) to provide 3D fields of background concentrations together with meteorology.
  - Conduct air quality simulations to assess impacts of individual sources (or collection of minor sources) on NO2 background and on local and regional air quality (estimated through simulations with and without selected sources or by applying source apportionment tools),
  - Develop an Air Toxics modeling program.