

# Performance Testing Overview

Maricopa County Air Quality  
Department



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Air Quality Department



WALK MORE USE CFLS MORE CARPOOL MORE  
BIKE MORE RAKE MORE TELECOMMUTE  
MORE DRIVE HYBRIDS MORE CONSOLIDATE  
ERRANDS MORE RIDE PUBLIC TRANSPORTATION  
MORE USE ENERGY EFFICIENT APPLIANCES  
MORE CARRY REUSABLE TOTE BAGS MORE  
CONSIDER SOLAR MORE RUN COLD WATER  
CYCLES MORE USE REUSABLE CONTAINERS  
MORE CONSERVE ELECTRICITY MORE REDUCE  
WOODBURNING MORE RECYCLE MORE USE  
ELECTRIC LAWN AND GARDEN EQUIPMENT  
MORE REFUEL AFTER DARK MORE RIDE  
THE BUS MORE RIDE THE LIGHT RAIL MORE  
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# What is a performance test?

- A physical measurement of the pollutant emissions from a piece of equipment or a process
  - Examples: gas turbine with SCR catalyst, boiler, hot mix asphalt plant, polystyrene manufacturer
- Other names: stack test, source test, emissions test, compliance test



# *How do you determine when a performance test required?*

- Is the performance test required by Maricopa County Rules?
- Did the facility install Equipment/Best Available Control Technology (BACT) to avoid regulatory requirements – to be below major source threshold?
- Does a performance test need to be performed to establish baseline data/emission characterization?

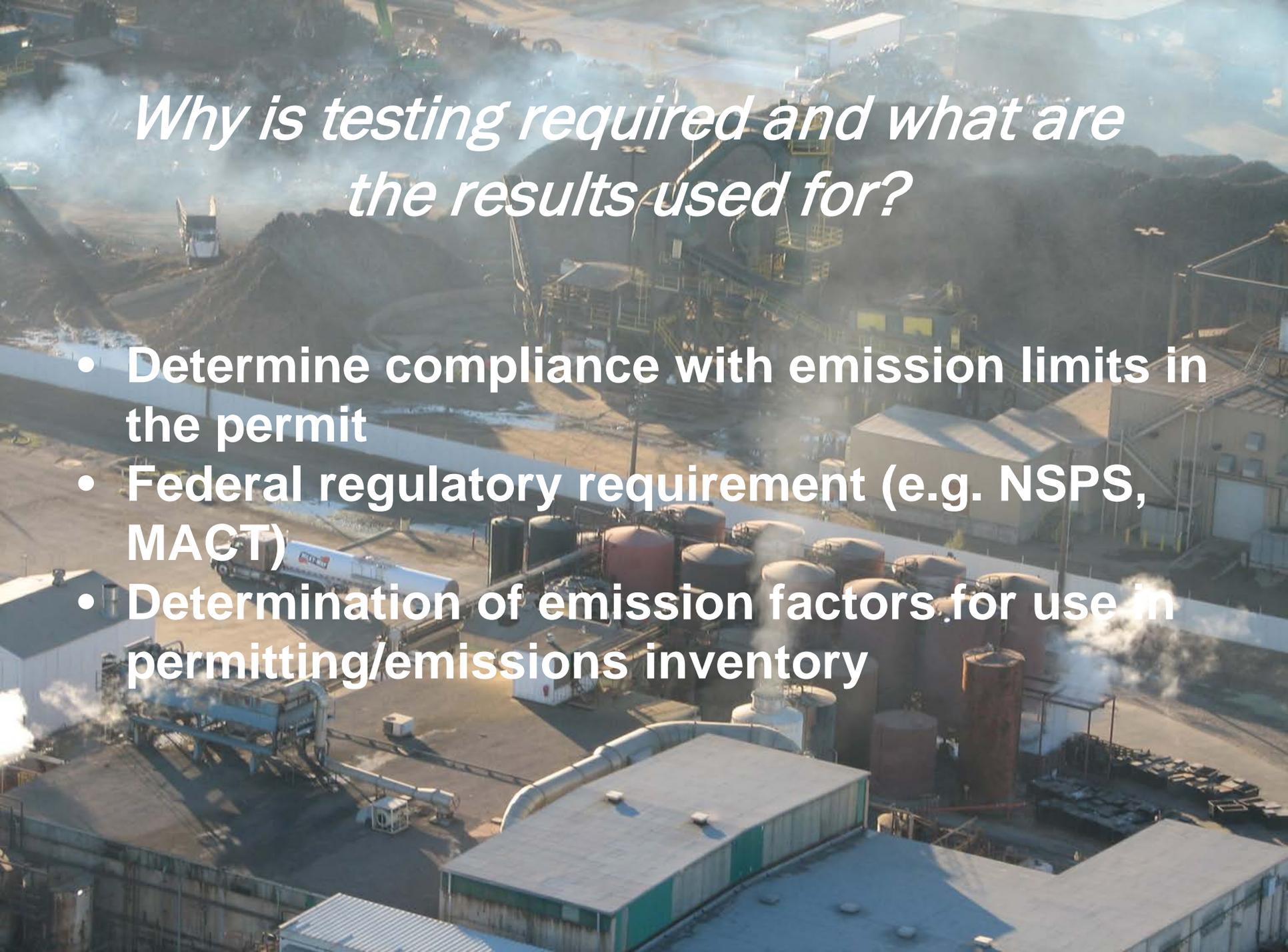
# How is the frequency of testing determined?

- By Rule or Standard
  - For Example: 40 CFR 63 ZZZZ or 60 N.
- Compliance Assurance:
  - Synthetic Minor source approaching Title V.
  - Non-Title V source approaching Rule 241 BACT.
  - Attainment of Non-attainment status.
  - Changing Emission Profiles (Ex: Arizona Solar One)
- Previous Testing Compliance Status



# What are some pollution controls and available monitoring techniques?

- **THC and OHAP**
  - Adsorbers
  - Thermal Oxidizers
  - Catalytic Oxidizers
  - Condensers
  - Capture Systems
- **PM**
  - Electrostatic Precipitators
  - PM Continuous Emission Monitoring System
  - Fabric Filter
  - Venturi Scrubber
- **Acid Gases**
  - Wet scrubbers
  - Dry Injection
  - Mercury Control
- **NOx**
  - Selective Catalytic Reduction (SCR)
  - NSCR
  - Water Injection
  - Low NO<sub>x</sub> Burners
- **Other**
  - Coatings and Solvents
  - Design Specs (dust control)
  - Process Operations (chemical processing, opacity requirements)

An aerial photograph of a large industrial facility, likely a refinery or chemical plant. The scene is filled with various structures, including large cylindrical storage tanks, rectangular buildings, and complex piping systems. Several smokestacks are visible, emitting plumes of white steam or smoke that rise into the air. The overall atmosphere is hazy, suggesting a clear day with some atmospheric haze or smoke. The lighting is bright, casting shadows on the ground and structures.

# *Why is testing required and what are the results used for?*

- Determine compliance with emission limits in the permit
- Federal regulatory requirement (e.g. NSPS, MACT)
- Determination of emission factors for use in permitting/emissions inventory

# *Testing Documents*

- **Test Protocols (submitted by test company)**
  - Describes proposed test methodology
  - Reviewed by department
- **Observation Notes (department engineer)**
  - Documentation of stack test events by the department
  - Was stack test performed in accordance with test methods?
  - Was stack test performed under representative conditions?
  - Data collected during testing
- **Test Report Reviews (results submitted by test company/facility)**
  - Test results reviewed by the department

# *Timelines:*

- Test protocols are required by the department to be submitted within 30 days of the actual start date of testing
- Notification of the actual test date must be provided to the department within 2 weeks of the start date of testing (Rule 270 Sec. 404)
- Most Non-Title V facilities test once per permit term (5 years)
- Title V facilities (e.g. power plants) may have to test annually
- New facilities must test within 60 days of achieving maximum sustained production rate but no later than 180 days after initial start up (Rule 270 Sec. 401)
- Existing facilities usually required to test within 60 days of issuance of permit renewal

# How are stack emissions measured?

- Stated simply:

$$\text{Pollution Emission Rate} = \text{Stack Pollutant Concentration} \times \text{Stack Flow Rate}$$

- Gases: Pollutant concentration is measured by a probe and analyzer.
  - Particulate: Test train captures particulate which is measured.
  - Stack flow rate is usually measured by a Pitot tube.
- Test results are usually based on the average of three test runs.



# *Performance Test Evaluation Primary Contacts*

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# Any Questions?

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