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Boiler NESHAP for Area Sources - Subpart JJJJJJ: Brief Overview of Proposed Changes

Boiler NESHAP History (Brief)

- > December 23, 2011 - Reconsidered rule proposal published
- > No Action Assurance letters issued by EPA
 - ✓ **February 7, 2012** - EPA assures no action on notification deadlines contained in the Boiler MACT (major sources)
 - ◆ Does not apply to area sources
 - ◆ Notifications for area sources were due in 2011
 - ✓ **March 13, 2012** - EPA assures no action on requirement in the area source rule to conduct a tune-up by March 21, 2012
 - ✓ **July 18, 2012** - EPA extends March 13th memo to include deadline for Notification of Compliance Status for initial
 - ✓ Letters expire December 31, 2012 or effective date of final rule, whichever comes first

Applicability Changes

- > Added temporary boilers to exemption list (consistent with major source rule)
- > Added residential and electric boiler exemption

Tune-Ups

- > Existing Boilers
 - ✓ Two years to demonstrate initial compliance for tune-ups
 - ✓ Will be due March 21, 2013
- > Seasonally Operated Boilers
 - ✓ New subcategory
 - ✓ Tune-up every 5 years
- > Oil-Fired Boilers \leq 5 MMBtu/hr
 - ✓ Tune-up every 5 years instead of biennially
- > New Boilers
 - ✓ Not required to complete initial tune-up at initial start-up

Definitions

- > Period of natural gas curtailment or supply interruption
 - ✓ Now includes on-site emergencies
 - ✓ Includes any gaseous fuel (not just natural gas)
- > Hot water heater
 - ✓ Now includes any hot water boiler < 1.6 MMBtu/hr

Other Updates

- > Emission Limits
 - ✓ Hg and CO limits for coal-fired units revised
- > Monitoring
 - ✓ Allowance for CO continuous emission monitor instead of stack testing
- > Various Recordkeeping and Reporting Requirements

Engine Rule Updates - NSPS and NESHAP

RICE Update - Current Rules

- > 40 CFR Part 63 Subpart ZZZZ (RICE NESHAP)
 - ✓ Can still be considered emergency if operates no more than 15 hours in Emergency Demand Response (EDR) program
- > 40 CFR Part 60 Subparts IIII and JJJJ (NSPS for Compression and Spark Ignition Engines)
 - ✓ Participation in any DR program, including EDR, triggers non-emergency standards

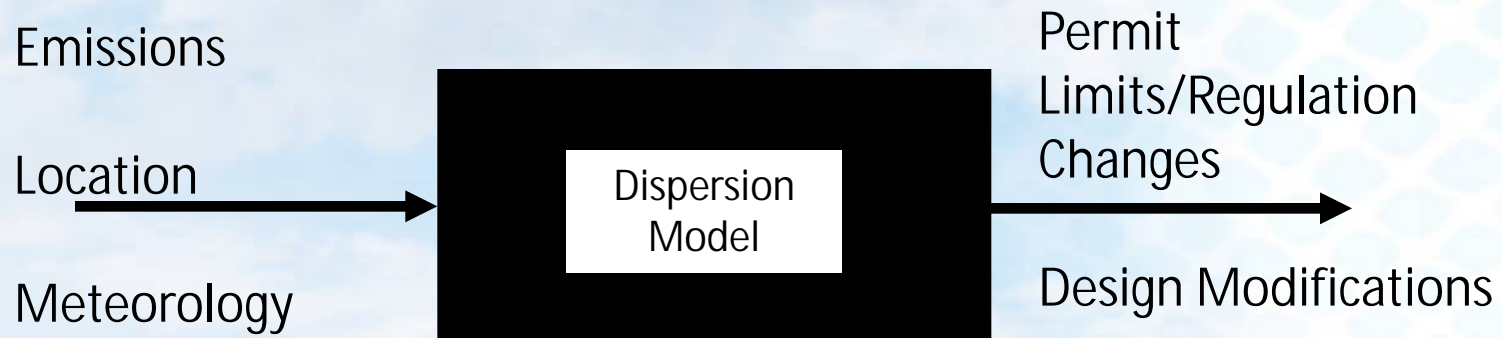
RICE Update - Proposed Rules

- > Proposed Amendments Published June 7, 2012
 - ✓ Allows participation in EDR program up to 100 hours per year
 - ◆ Included in 100 hours allowed for testing and maintenance
 - ✓ Emergency engines at area sources can participate in non-emergency (peak shaving) up to 50 hrs/year through 4/16/2017
 - ◆ Included in 100 hours allowed for testing and maintenance
 - ✓ Added compliance options for certain sources
 - ✓ Public hearing - July 10, 2012
 - ✓ Comments were due - August 9, 2012
 - ✓ Final Expected by December 14, 2012
 - ◆ Per Settlement Agreement

Air Dispersion Modeling 101

Presentation Goal

Develop basic understanding of modeling concepts to reduce “black box” of modeling



Purpose of Dispersion Modeling



Compare to
Standards/
Guidelines

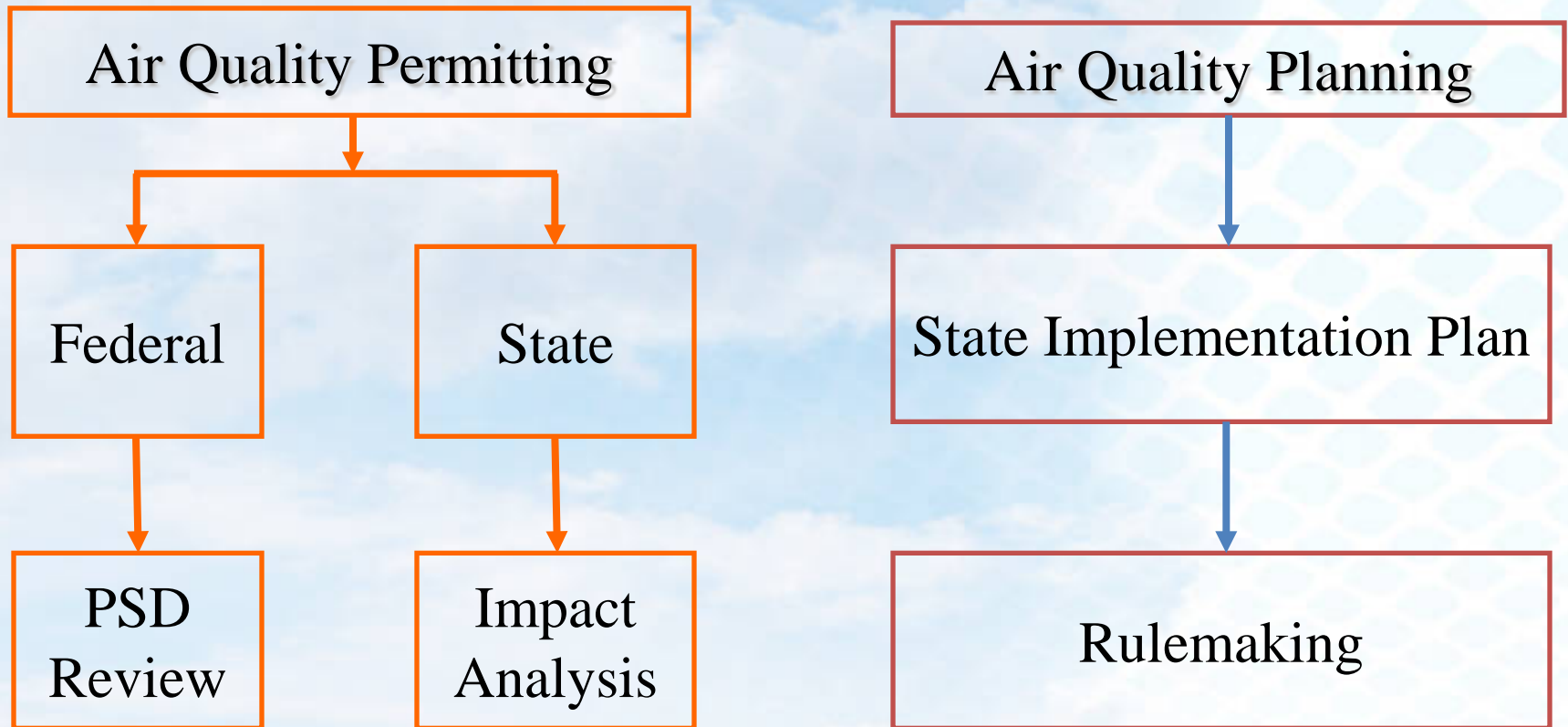
OR

Establish
Stack
Design



***When Is Modeling
Needed?***

When is Modeling Required?



** For projects that do not trigger a Federal review, modeling for criteria pollutants (NAAQS) may be requested by State or County agency*

***What Do Some Of The
Acronyms And Terms Mean?***

Modeling Definitions - Ambient Air

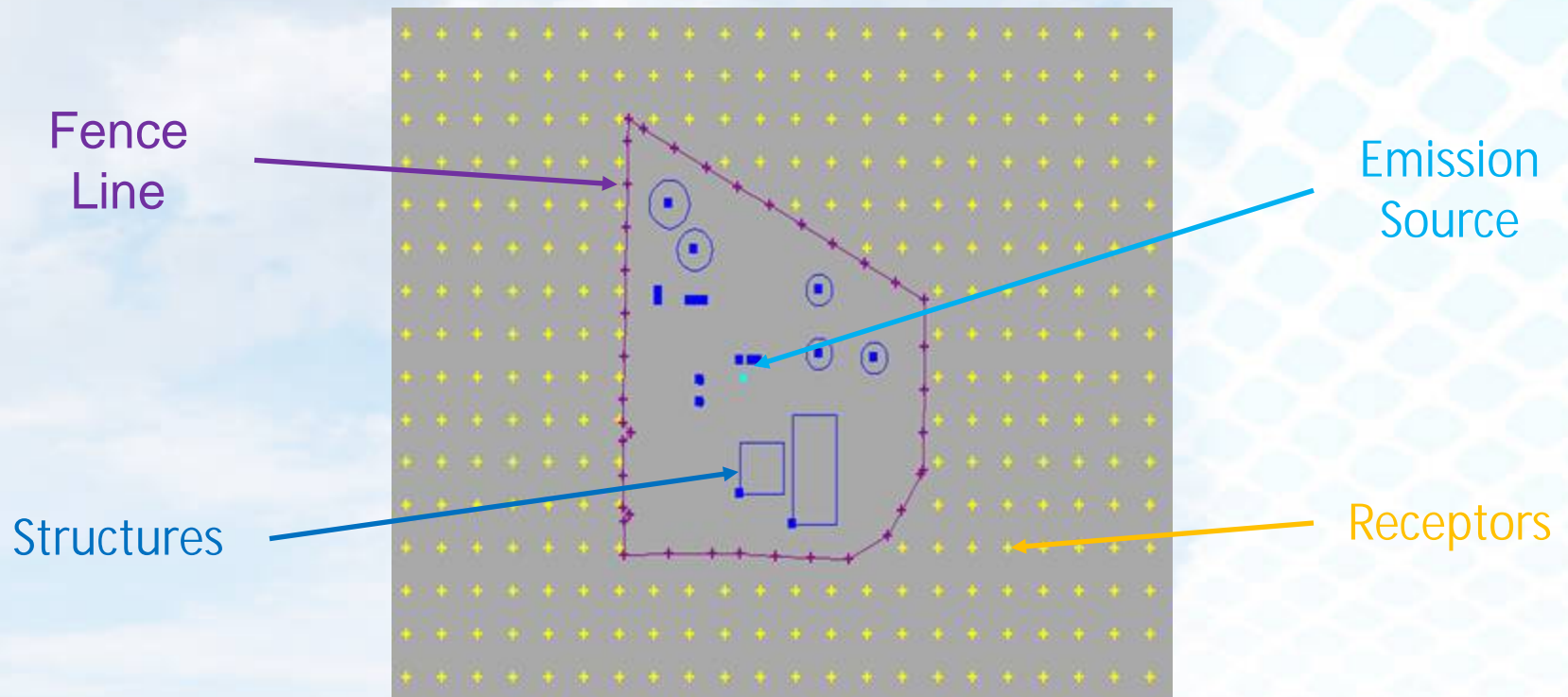
(1 of 6)

> Ambient Air

- ✓ The portion of the atmosphere, external to buildings, to which the general public has access
[40 CFR Part 50.1 (e)]
- ✓ In General
 - ◆ Any location at or beyond the fence line of the facility
 - ◆ Fence line must restrict public access by a continuous physical barrier, such as a fence or a wall
 - ◆ If plant property is accessible to the public or if any residence is located within the restricted area, receptors should be located on-property

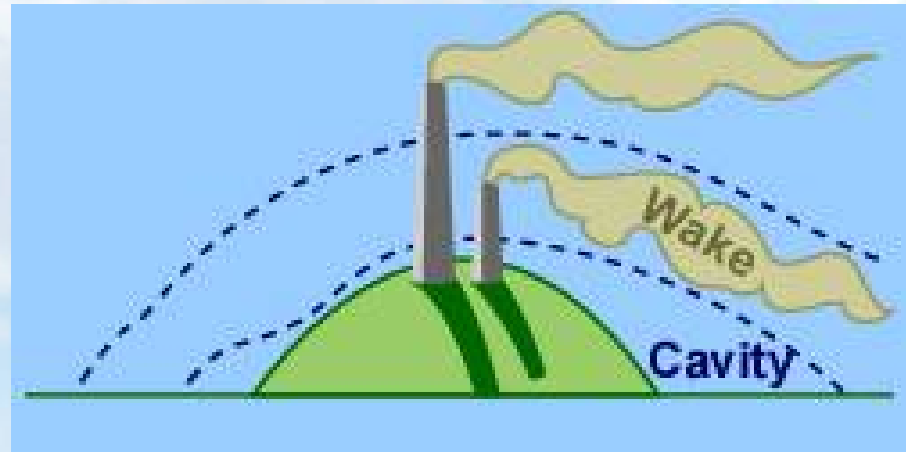
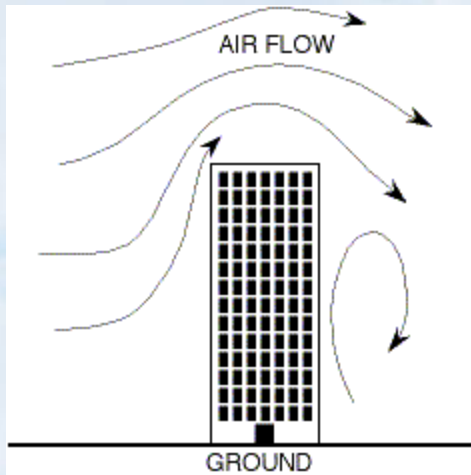
Modeling Definitions - General

(2 of 6)



Modeling Definitions - Downwash

(3 of 6)



In about 80% of all modeling cases, maximum concentrations occur at receptors affected by downwash

Modeling Definitions - GEP

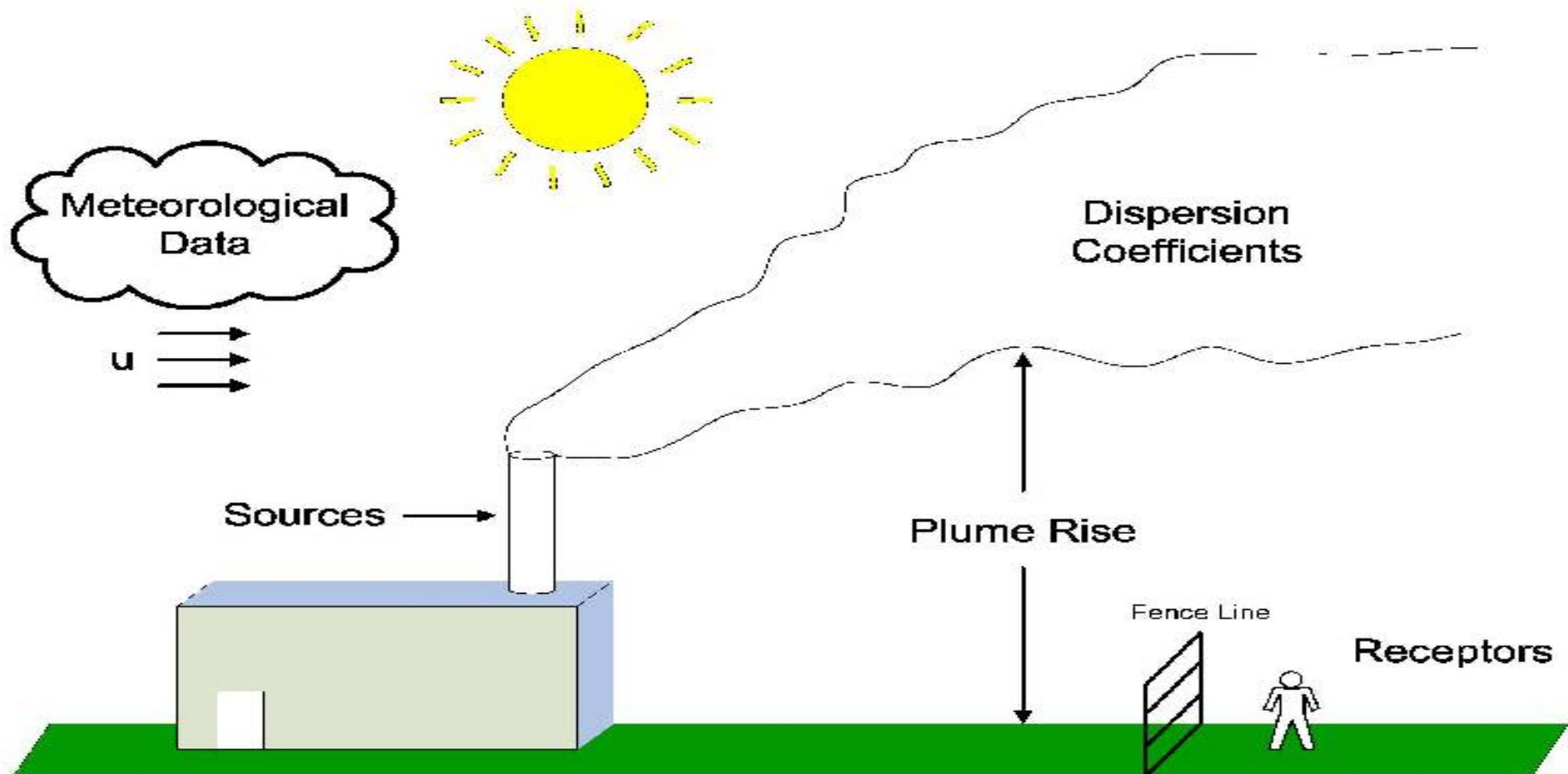
(4 of 6)

- > Good Engineering Practice (GEP) Stack Height
- > GEP - The stack height at which building downwash no longer occurs
- > GEP = Maximum of 65 meters or $H_b + 1.5L$
 - ✓ H_b = height of building
 - ✓ MPW = Maximum projected width of building
 - ✓ L is the lesser of H_b and the maximum projected width (MPW)
- > ***Cannot model a stack higher than GEP***



Modeling Definitions - Other Parameters

(5 of 6)



Modeling Definitions -Background

(6 of 6)

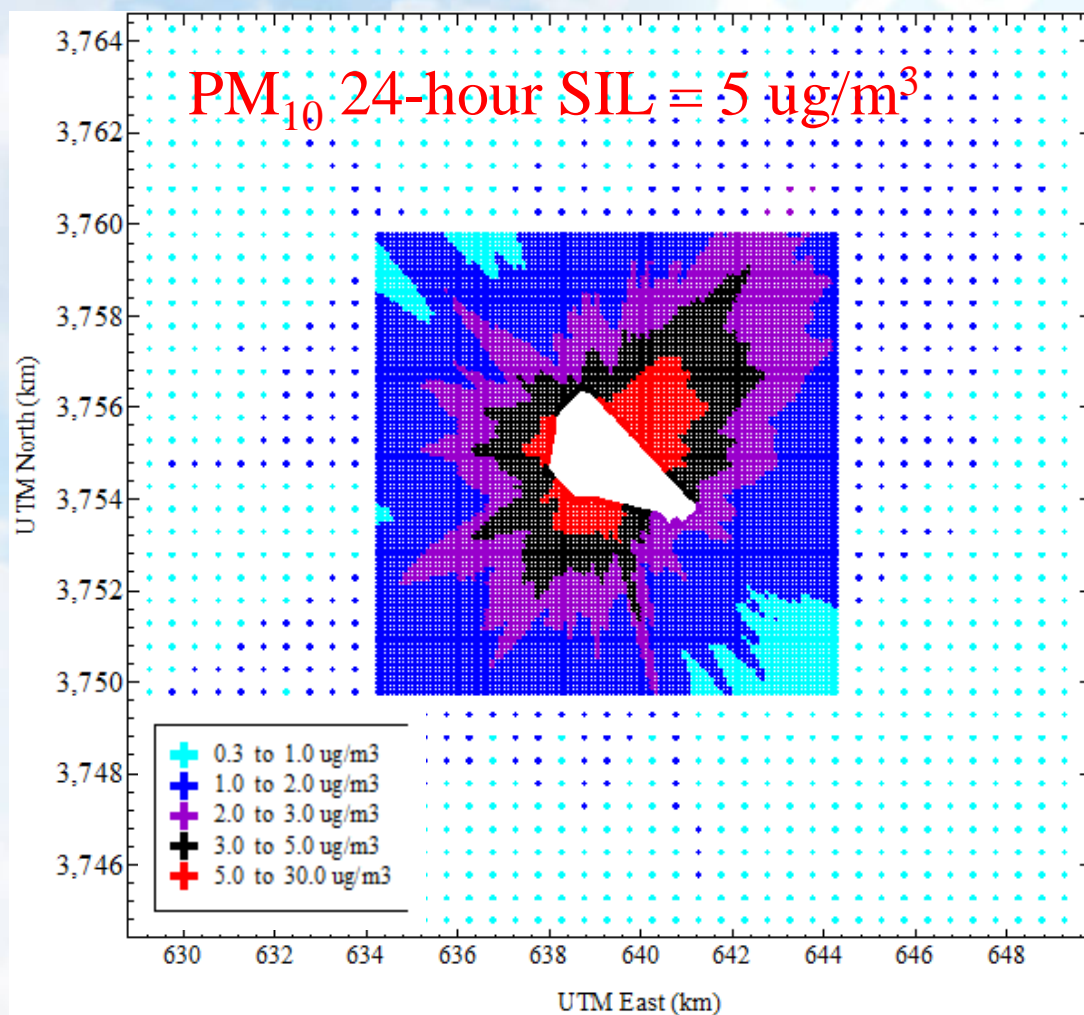
> Background Concentration

- ✓ Often required to determine the total ambient pollutant concentration
- ✓ Includes sources **not considered** in modeling (e.g. vehicles, etc.)
- ✓ Obtained from ambient air monitoring data recorded at monitoring sites in the area
- Generally selected based on:
 - ◆ **Proximity** of the monitoring site to the proposed source
 - ◆ **Age and completeness** of the available monitoring data
- ✓ New 1-hour standards have more refined guidance on pairing background concentration

NAAQS Modeling Definitions

(1 of 4)

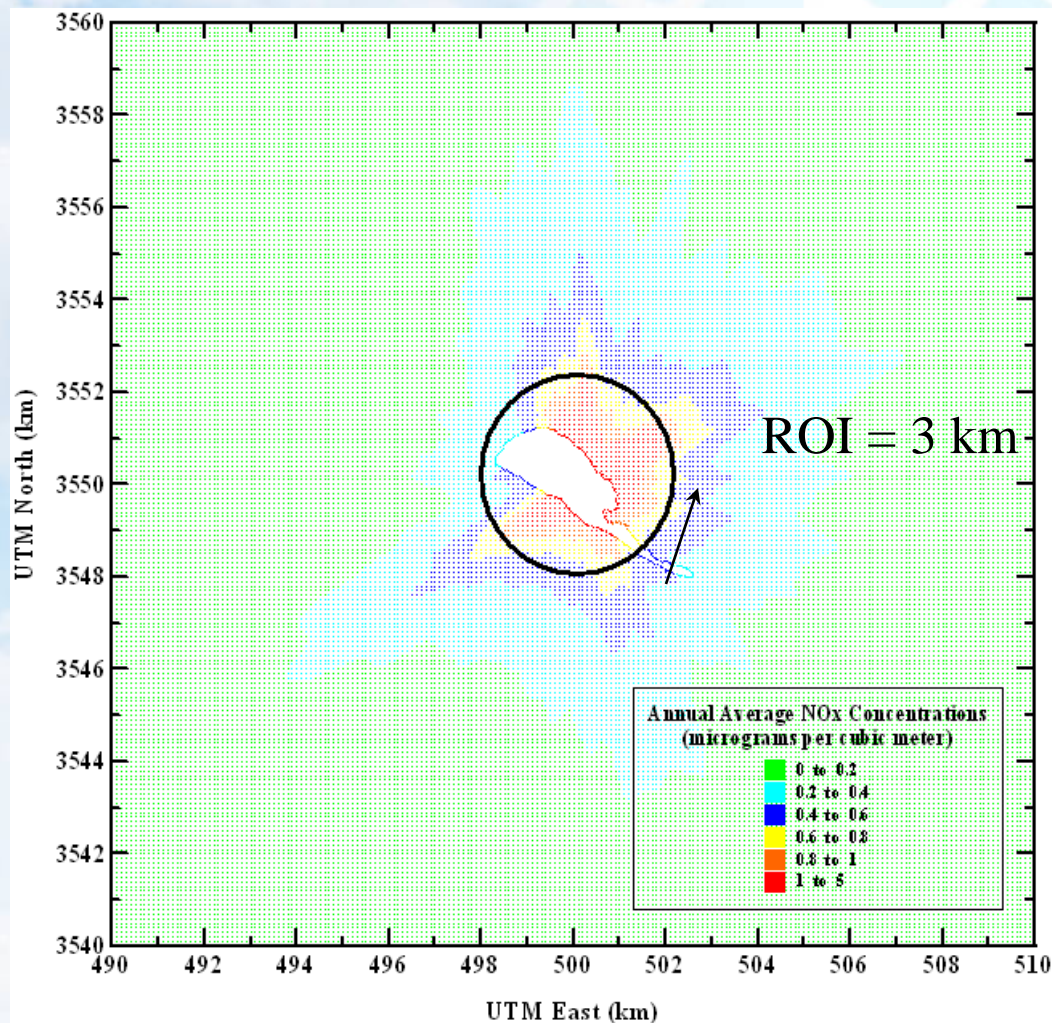
- > Significance Analysis - Determining if new project has a "significant impact"
- > SIL - Significant Impact Level



NAAQS Modeling Definitions

(2 of 4)

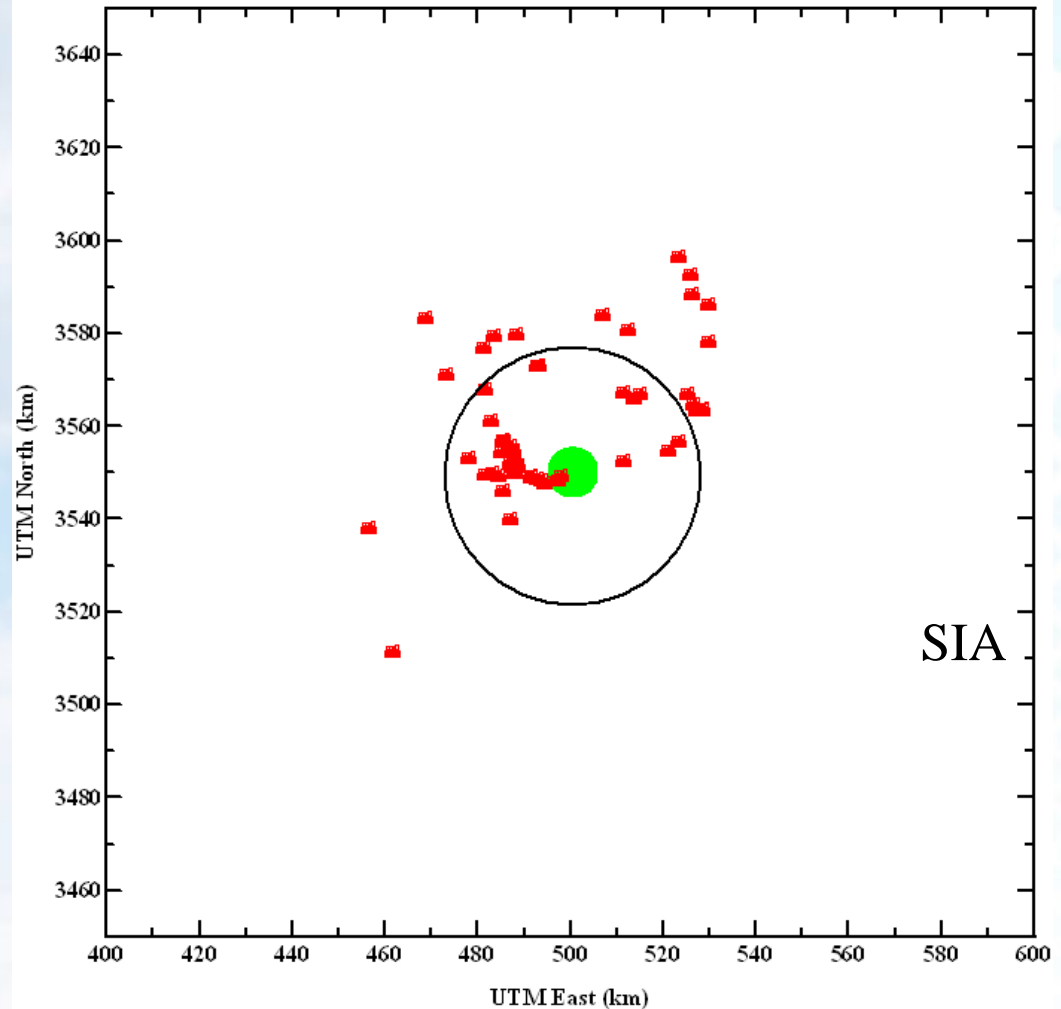
- > ROI = Radius of Impact
- > SIA = Significant Impact Area = ROI + 50 km



NAAQS Modeling Definitions

(3 of 4)

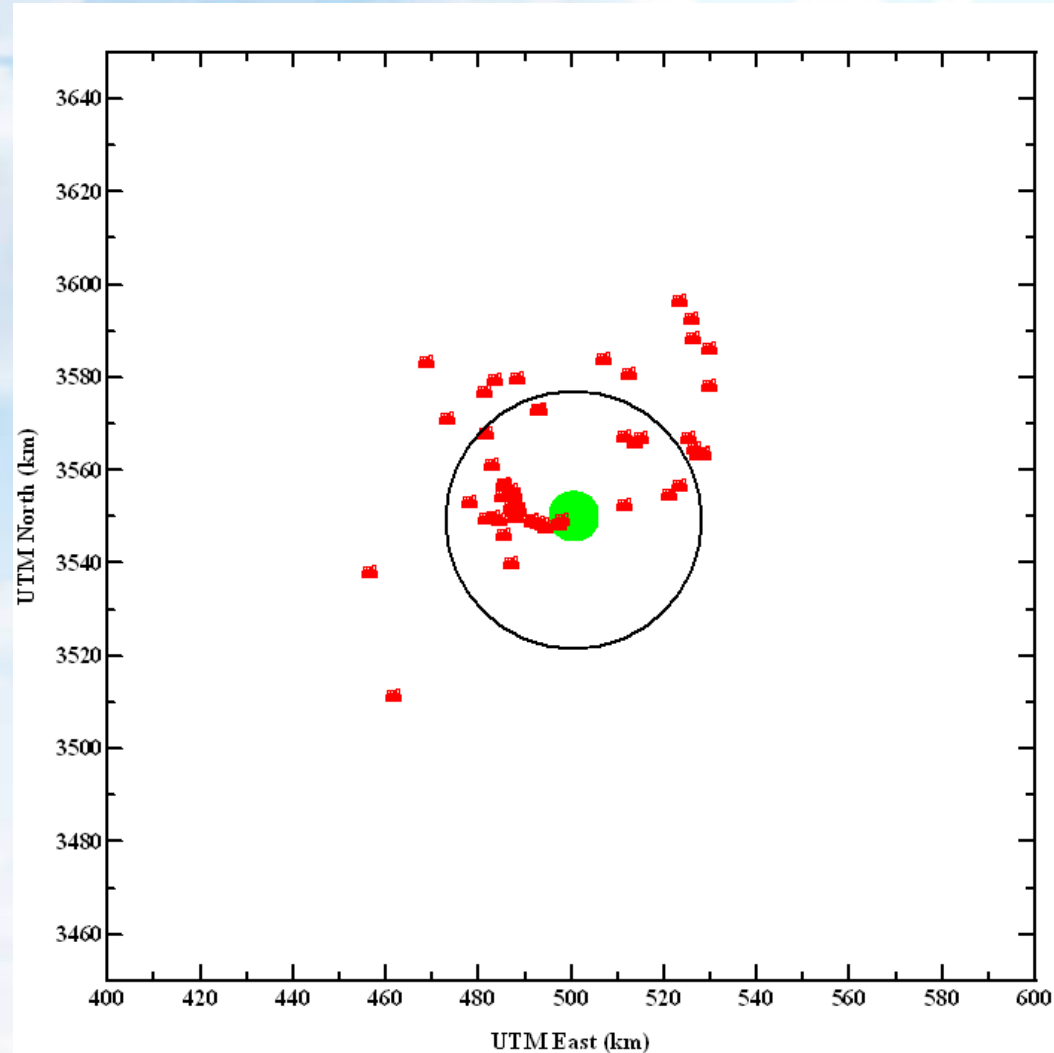
- > Regional source inventory



NAAQS Modeling Definitions

(4 of 4)

- > Model New Project + Regional source inventory
- > Impact + background should be < NAAQS

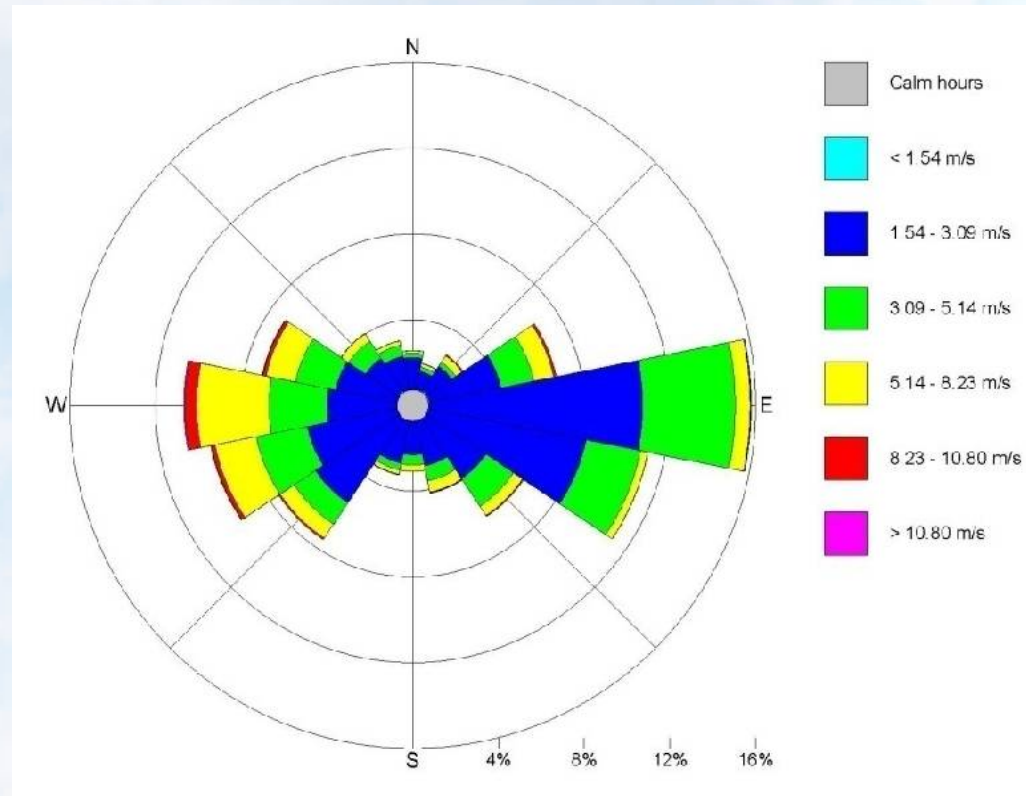


***What Are The Critical
Inputs To The Models?***

Critical Inputs - Meteorology

(1 of 6)

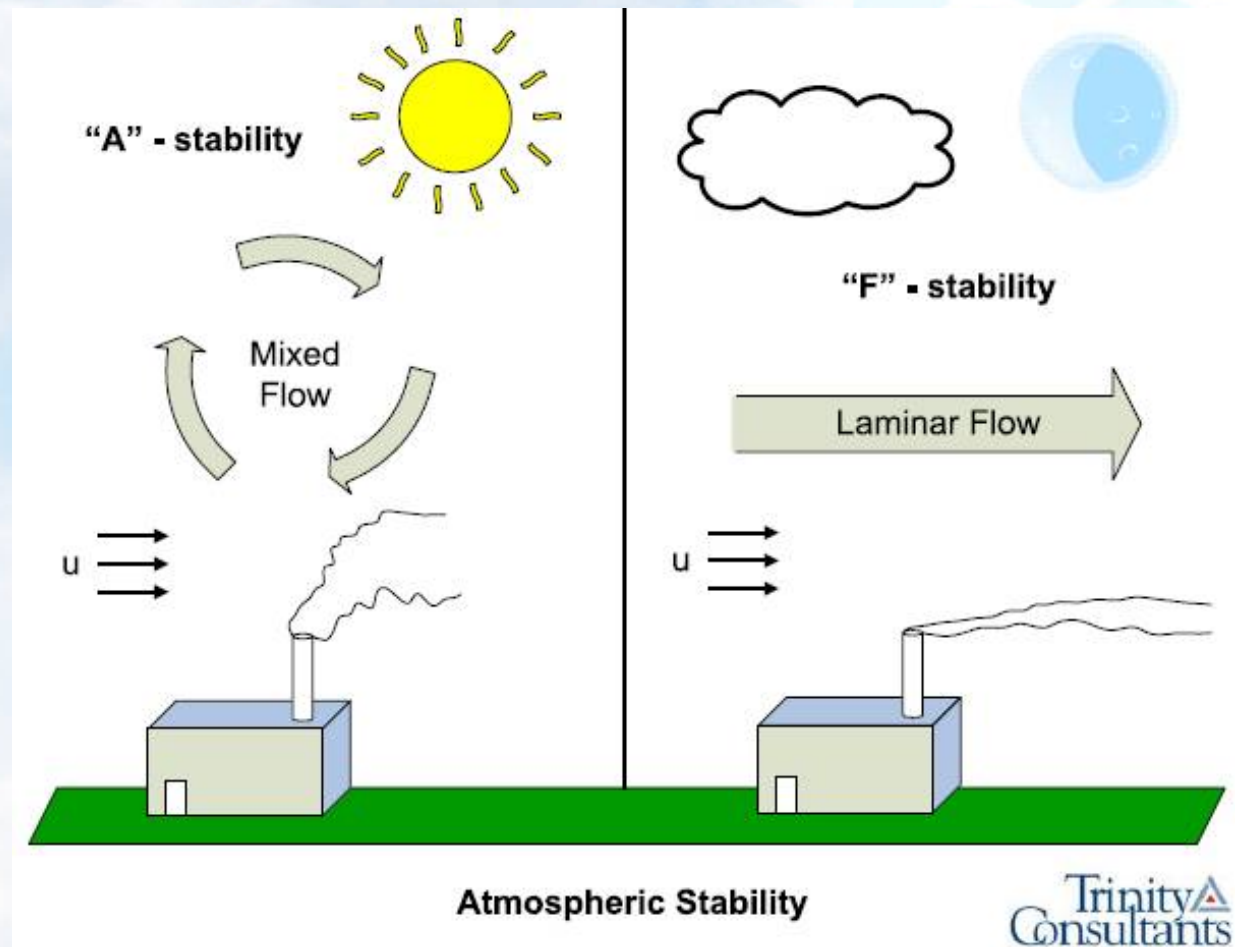
> Wind speed and direction



Critical Inputs - Meteorology

(2 of 6)

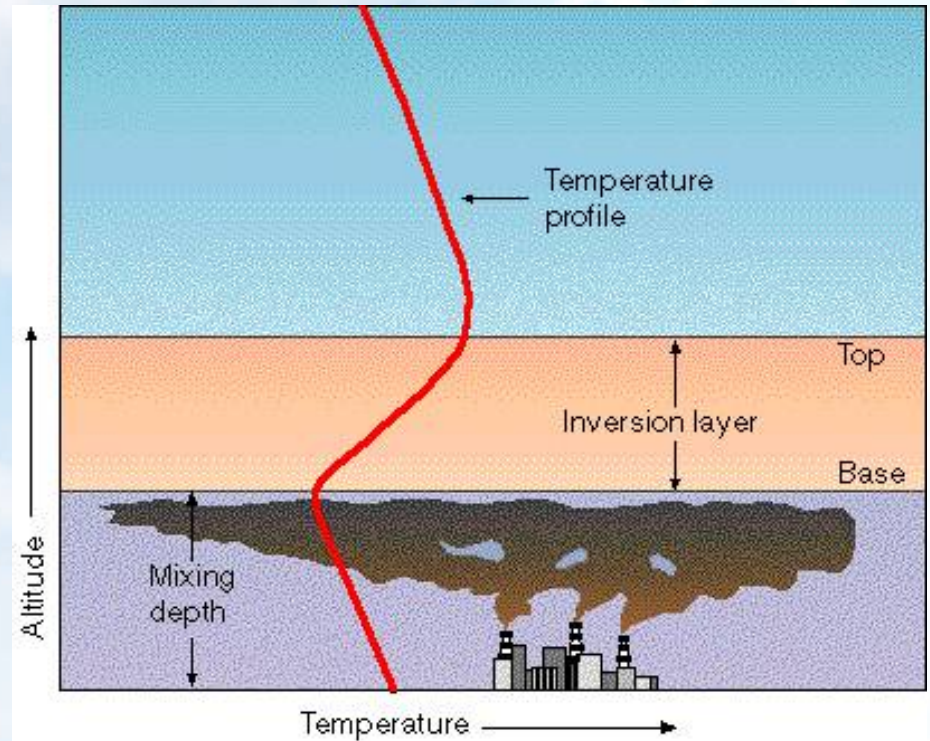
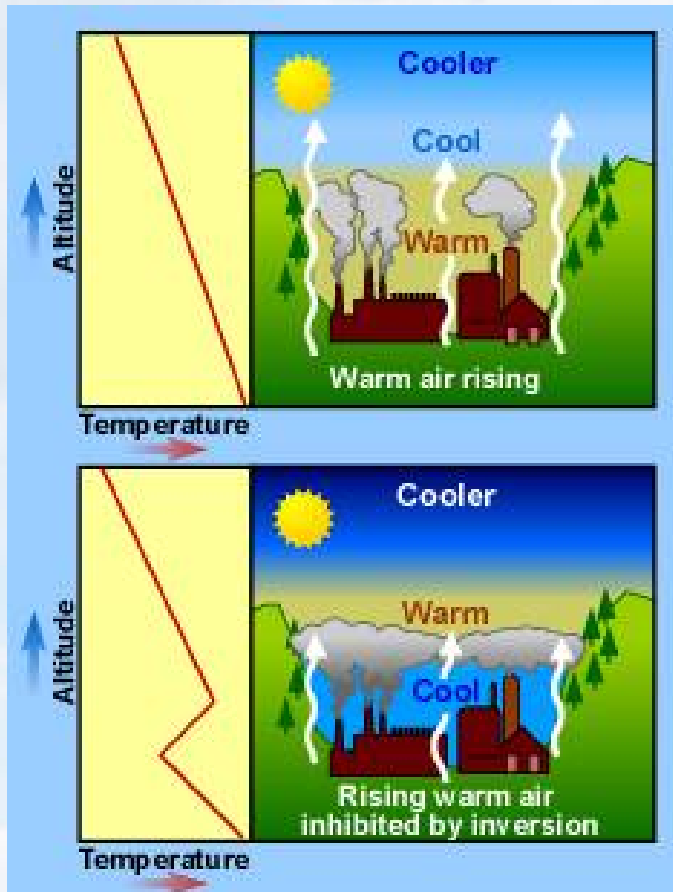
> Turbulence and stability



Critical Inputs - Meteorology

(3 of 6)

> Mixing height

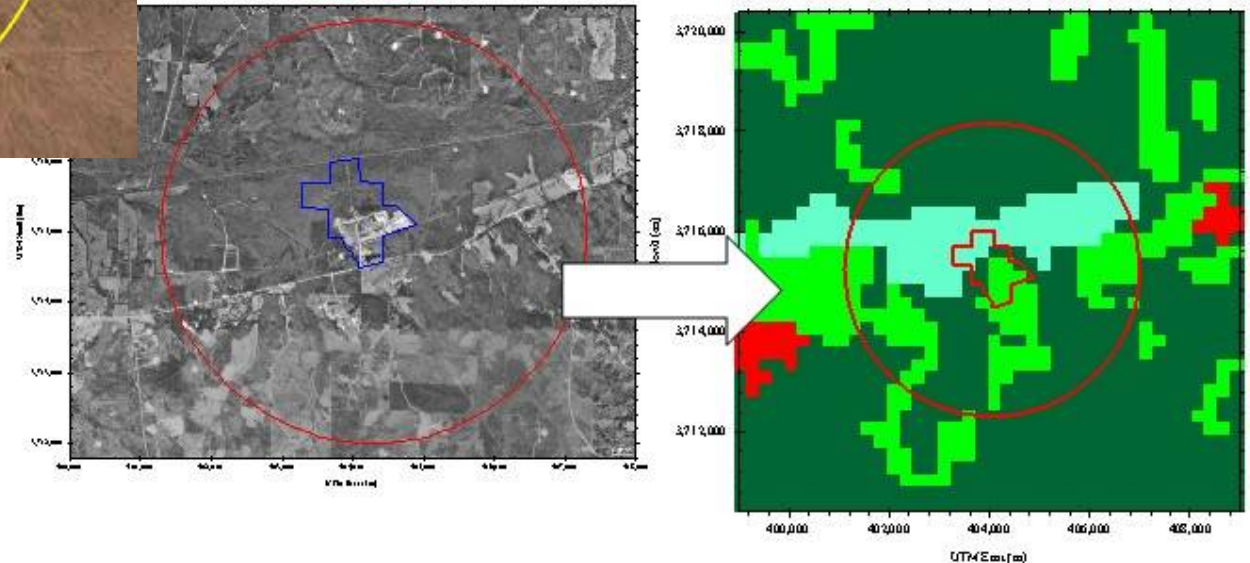
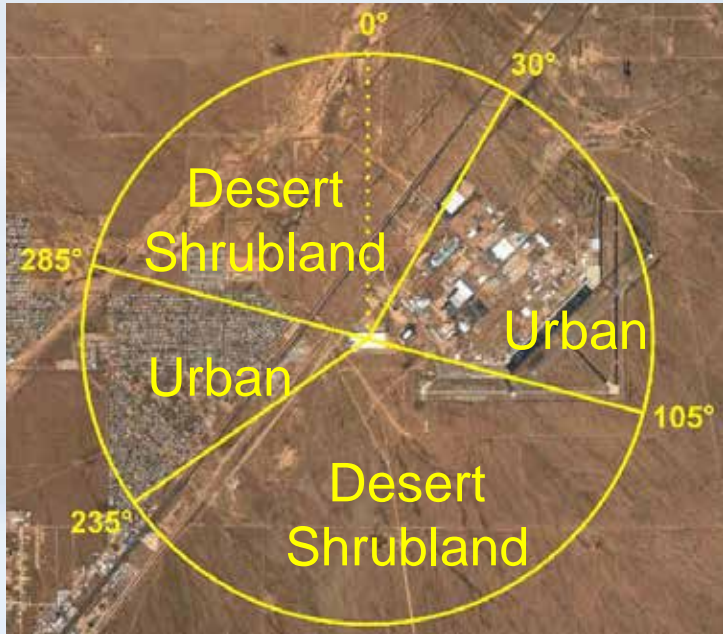


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Critical Inputs - Landuse

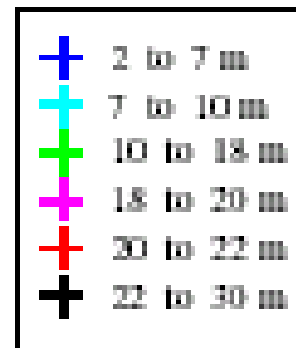
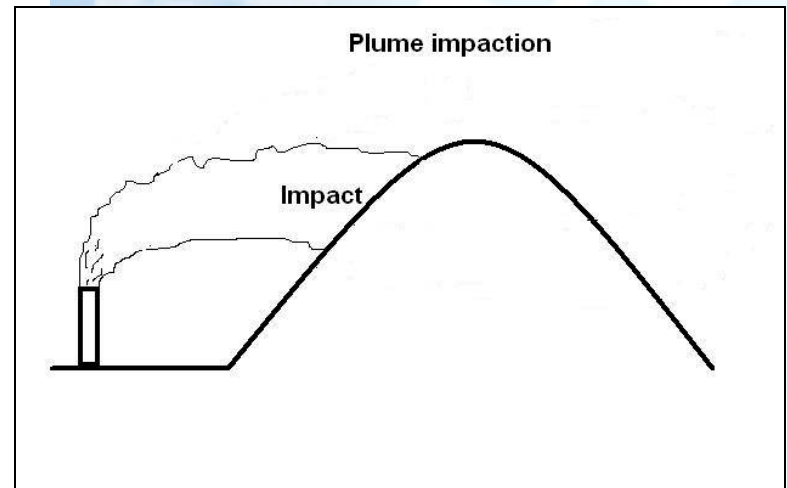
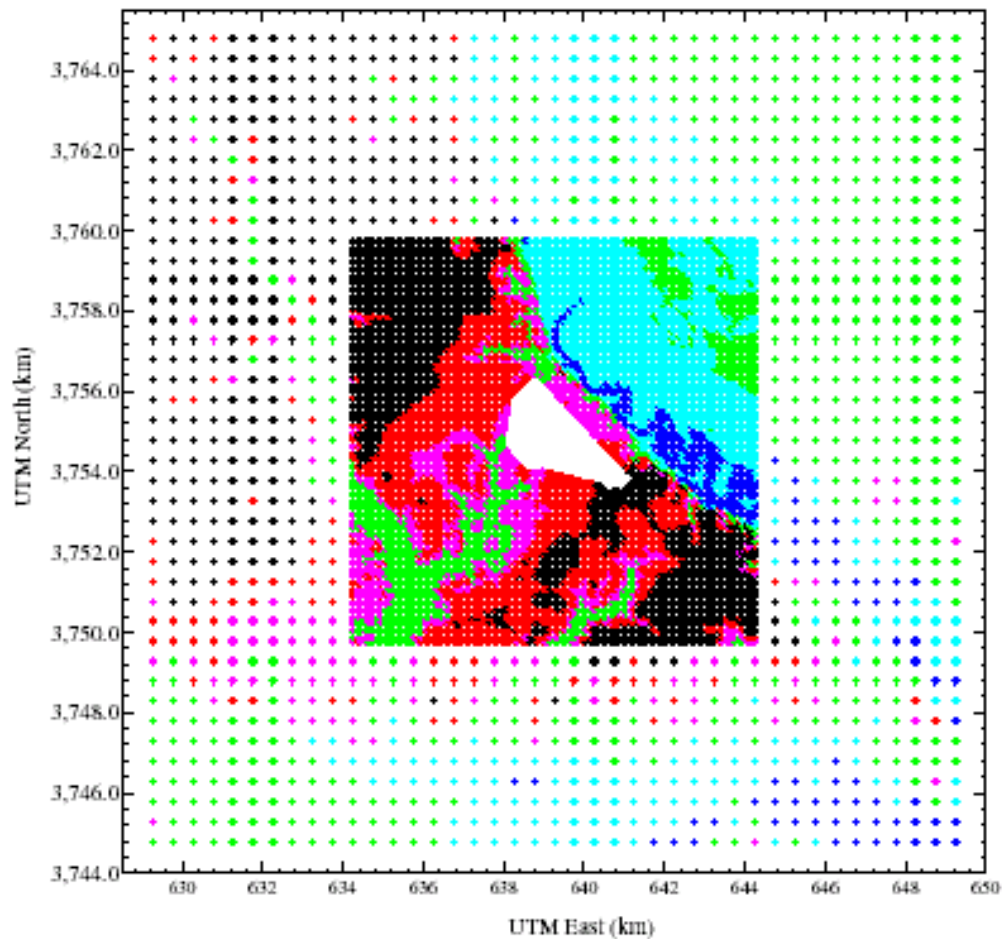
(4 of 6)

- > Used to be performed manually
- > Now performed using AERSURFACE



Critical Inputs - Elevations

(5 of 6)



Critical Inputs - Point Sources

(6 of 6)

- > Stack location
- > Horizontal/obstructed release
- > Inside stack-tip diameter
- > Exit velocity or flow rate (ACFM)
- > Exit temperature
- > Height above grade
- > Pollutant and emission rate
- > Other source types not typically relevant to communications industry



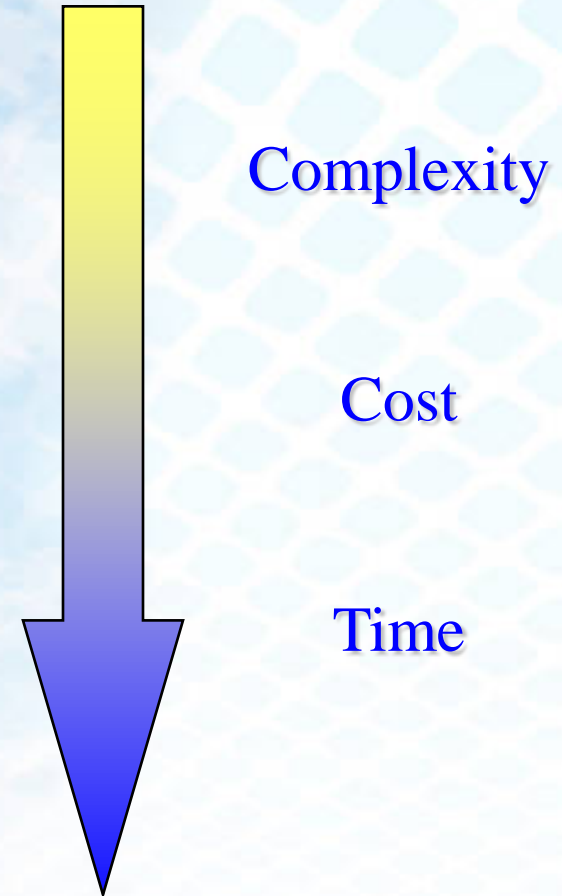
Typical Modeling Procedures

- > Obtain and process representative meteorological data
- > Develop or obtain a site plan (sources, structures, boundary)
- > Characterize emission sources (area, volume, point, etc.)
- > Define modeling domain, receptor locations, and obtain/process terrain elevation data
- > Input building data and obtain downwash information
- > Develop model input files and select processing options
- > Run model and analyze results



40 CFR Appendix W Air Models

- > AERSCREEN (formerly SCREEN3)
 - ✓ Fast, conservative “screening model”
 - ✓ Typically used for small projects
- > AERMOD
 - ✓ Short range regulatory model (< 50 km)
 - ✓ Run by applicant
- > CALPUFF
 - ✓ For visibility and long-range impacts
 - ✓ Run by applicant
 - ✓ Usually for Federal projects only



***What Additional Things
Should I Consider?***

Additional Considerations

(1 of 3)

- > Be aware of local ordinances and other requirements
 - ✓ Many states require vertical, unobstructed stacks for engines in order to achieve good air dispersion
 - ✓ Is there a minimum or maximum stack height requirement?
 - ◆ Philadelphia historic district restricts stack height due to historic nature of building
 - Could affect air dispersion if modeling is required!
 - ◆ Massachusetts minimum stack height for certain emergency generators
 - Must avoid locations subject to downwash
 - Minimum stack height of 10 feet or 1.5 times height of building on which stack is located
 - Must not violate air quality standards (usually addressed during permitting)
 - ✓ Modeling can be key to addressing these issues

Additional Considerations

(2 of 3)

- > Sensitive Receptors
 - ✓ Homes
 - ✓ Schools
 - ✓ Daycare centers
 - ✓ Endangered species habitat
- > Some Agencies Take It Further (MADEP)
 - ✓ People
 - ✓ Windows and doors that open
 - ✓ Building fresh air intakes

Additional Considerations

(3 of 3)

- > Sensitive Receptors (con't.)
 - ✓ State may have rules for installing and/or permitting near sensitive receptors
 - ✓ Agency may claim there are Environmental Justice-type issues that need to be addressed
 - ✓ May be able to use emissions and operating data as well as modeling to address these issues

Questions?

